GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD-16

Affiliated To Osmania University, Re-Accredited With 'B^{+}' Grade by NAAC

DEPARTMENT OF APPLIED NUTRITION AND PUBLIC HEALTH

POs, PSOs, COs, SYLLABUS (2020-2021)

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A) BEGUMPET
HYDERABAD.

DEPARTMENT OF APPLIED NUTRITION

FIRST YEAR			**SEMESTER I**	
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**
BS101	ENVIRONMENTAL STUDIES	AECC I	2	2
BS102	ENGLISH	CC- I A	**4**	4
BS103	SECOND LANGUAGE	CC -2 A	**4**	4
BS104	**BASICS OF BIOCHEMISTRY**	DSC-IA	4T+2P=6	4+1=5
BS105	OPTIONAL II	DSC -2A	4T+2P=6	4+1=5
BS 106	OPTIONAL III	DSC- 3A	4T+2P=6	4+1=5
	TOTAL			**25**
FIRST YEAR			**SEMESTER II**	
BS 201	GENDER SENSITIZATION	AECC 2	2	2
BS 202	ENGLISH	CC- I B	4	4
BS 203	SECOND LANGUAGE	CC -2 B	4	4
BS 204	**NUTRITIONAL BIOCHEMISTRY**	DSC- IB	4T+2P=6	4+1=5
BS 205	OPTIONALII	DSC- 2B	4T+2P=6	4+1=5
BS 206	OPTIONALIII	DSC- 3B	4T+2P=6	4+1=5
	TOTAL			**25**
SECOND YEAR			**SEMESTER III**	
BS 301	**FOOD SERVICE MANAGEMENT SKILLS**	SEC - I	2	2
BS 302	**PATIENT COUNSELING SKILLS**	SEC - II	2	2
BS 303	ENGLISH	CC- IC	3	3
BS 304	SECOND LANGUAGE	CC -2C	3	3
BS 305	**FOOD SCIENCE & TECHNOLOGY**	DSC - IC	4T+2P=6	4+1=5
BS 306	OPTIONAL- II	DSC- 2C	4T+2P=6	4+1=5
BS 307	OPTIONAL- III	DSC- 3C	4T+2P=6	4+1=5
	TOTAL			**25**
SECOND YEAR			**SEMESTER IV**	
BS 401	**QUANTITY FOOD PRODUCTION**	SEC – 3	2	2
BS402	**NUTRITION AND FITNESS**	SEC - 4	2	2
BS 403	ENGLISH	CC- I D	3	3
BS 404	SECOND LANGUAGE	CC -2 D	3	3
BS 405	**FAMILY & COMMUNITY NUTRITION**	DSC – 1D	4T+2P=6	4+1=5
BS 406	OPTIONAL- II	DSC- 2D	4T+2P=6	4+1=5
BS 407	OPTIONAL- III	DSC- 3D	4T+2P=6	4+1=5
	TOTAL			**25**
THIRD YEAR			**SEMESTER V**	
BS 501	ENGLISH	CC – 1E	3	3
BS502	SECOND LANGUAGE	CC – 2E	3	3
BS 503	FUNDAMENTALS OF FOOD &	GE	4	4

	NUTRITION			
BS 504	**FOOD SAFETY & QUALITY CONTROL**	DSE-1E	4T+2P=6	4+1=5
BS 505	OPTIONAL- II	DSE-2E	4T+2P=6	4+1=5
BS 506	OPTIONAL- III	DSE-3E	4T+2P=6	4+1=5
	TOTAL			**25**
THIRD YEAR			**SEMESTER VI**	
BS 601	ENGLISH	CC – 1F	3	3
BS 602	SECOND LANGUAGE	CC – 2F	3	3
BS 603	**PUBLIC HEALTH FOOD HYGIENE & SANITATION**	DSE-1F	4T+2P=6	4+1=5
BS 604	OPTIONAL- II	DSE-2F	4T+2P=6	4+1=5
BS 605	OPTIONAL- III	DSE-3F	4T+2P=6	4+1=5
BS 606	PROJECT WORK		4	4
	TOTAL			**25**

CC-Core Course AECC- Ability Enhancement Compulsory Course GE- General Elective DSC- Discipline Specific Course SEC- Skill Enhancement Course DSE- Discipline Specific Elective HPW- Hours per Week P- Practical T- Theory

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET HYDERABAD.
B.Sc. CBCS
DEPARTMENT OF APPLIED NUTRITION

S.NO	COURSE CATEGORY	NO.OF COURSES	CREDITS PER COURSE	CREDITS
1.	AECC	2	2	4
2.	SEC	4	2	8
3.	CC	2	4 (I YEAR), 3 (II YEAR), 3 (III YEAR)	40
4.	DSC	20	5	60
6.	DSE	10	5	30
7.	GE	1	4	4
8.	PROJECT WORK	1	4	4
	TOTAL	**37**		**150**
	CREDITS UNDER NON CGPA			
	NSS / NCC/ SPORTS/ EXTRA CURRICULAR		UPTO 6 (2 IN EACH YEAR)	
	SUMMER INTERNSHIP		UPTO 4 (2 IN EACH YEAR)	

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyze the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual.

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAMME SPECIFIC OUTCOMES

PSO1: Gain in depth knowledge on nutritional basics

PSO2: Understand fundamentals of nutritional biochemistry in relation to health and disease.

PSO3: Utilize basic nutrition knowledge and the dietary guidelines for making food choices that will promote optimal health.

PSO4: Develop understanding about nutrition in disease management, its prevention through various government programmes and policies.

PSO5: Plan a balanced diet for different age groups based on the nutritional concerns

PSO6: Able to provide nutrition counseling to patients using a variety of techniques.

PSO7: Gain competancy in food management for entrepreneurship.

PS08: Emphasize the correlation between nutrition and staying fit and understand the role of exercise and physical activity.

PSO9: Apply acquired skills in diet therapy, food service management, nutrition/health education.

PSO10:Understand the significance of beneficial microbes in foods as well as pathogen microbes - their sources, and the conditions under which they flourish.

PSO11: Gain in-depth knowledge on Physical and chemical contaminants and natural toxic substances.

PSO12: Assess the adulterants present in the food samples.

PSO13: Gain in-depth knowledge on various quality control measures of food products.

PSO14: Examine and judge the appropriateness of packaging of food to ensure compliance with Indian laws.

SEMESTER 1 -BASICS OF BIOCHEMISTRY

Credits: Theory-4, Practicals-2 Theory: 60 Lectures

COURSE OUTCOMES

Unit 1: Introduction to Nutrition& Carbohydrates -

CO 1: Understanding of nutrition basics - food groups, body needs for nutrients and carbohydrates – sources, process of digestion, metabolism and utilization.

CO 2: Gain knowledge about carbohydrates, their role and utilization in body processes and understand biological cycles involved in carbohydrate metabolism.

Unit 2: Proteins & Nucleic Acids -

CO 3: Understand proteins and their role and utilization in body processes and learn about the metabolism of amino acids.

CO 4: Gain Knowledge on basic structure and functional significance of nucleic acids.

Unit 3: Lipids

CO 5: Understand lipid metabolism and their role in human nutrition. Learn about the consequences of high fat consumption in the diet.

CO 6: Gain Knowledge about essential fatty acids and their deficiency.

Unit 4: Energy Metabolism

CO 7: Gain knowledge about types of energy and principles of calorimetry. Understand the concept of Recommended Dietary Allowance.

CO 8: Determines energy value of various and understand the concept of Basal Metabolic Rate.

YEAR I – SEMESTER-II

BS104 DISCIPLINE SPECIFIC COURSE IA-

(DSC IA) **BASICS OF BIOCHEMISTRY**

CREDITS-4 **60 HOURS**

UNIT 1- INTRODUCTION TO NUTRITION& CARBOHYDRATES

16 HOURS

1.1 Introductory Nutrition, Definition of Nutrition, Food, Nutrients, or Proximate Principles, Nutritional needs of body, specific role of nutrients, classification of foods, food groups.

1.2 **Carbohydrates** — Composition and chemistry, classification, sources, nutritional significance, digestion, absorption and metabolism - Glycolysis, TCA Cycle with bioenergetics.

Unit II- PROTEINS & NUCLEIC ACIDS **18 HOURS**

2.1 Proteins: Composition and chemistry, classification sources, functions, digestion and absorption, denaturation. Nutritional significance of some amino acids. General properties of proteins, metabolism, deamination, transamination, decarboxylation. Outlines supplementary value of amino acids. Deficiency of Protein — PEM definition, classification, and age groups affected

2.2 Nucleic acids: Composition — purine and pyrimidine bases DNA, RNA — structure and biological functions

Unit III- LIPIDS **14 HOURS**

3.1 Composition Chemistry classification- simple, compound & derived lipids with functions, cholesterol functions & ranges sources, chemical properties. Digestion and Absorption,

3.2 Essential fatty acids-omega3 & omega 6: functions and deficiency,

Elements of fat analysis, Metabolism: Beta- oxidation of fatty acids. Types of Rancidity, Ketosis

Unit IV-ENERGY METABOLISM **12 HOURS**

4.1 Types of energy, energy yielding food factors, RDA & factors affecting RDA, energy units.

Principle of direct& indirect calorimetry

4.2 Determination of energy value of food using bomb calorimeter. PFV (Physiological Fuel Value) of foods, RQ, SDA of food.

Determination of BMR and factors affecting BMR

REFERENCE BOOKS

- ✓ Nutrition science- B Srilakshmi, New age international publishers, 2nd edition.

- ✓ A textbook of biochemistry, Dr. AVSS Rama Rao, 10th edition, UBS publishers Distribution pvt. Ltd.
- ✓ Biochemistry- U satyanaraya, U chakrapani, Books and Allied(P.Ltd)
- ✓ Helen A. Guthrie, Introductory Nutrition, Times MirrorMosby
- ✓ SwaminathanM, Advance Textboo on Food and Nutrition, Volume 1, The Bangalore printing and publishingco.,Ltd.
- ✓ Mudambi SR and Rajagopal M V, Fundamentals of food and Nutrition, Willey Eastern Ltd.
- ✓ Swaminathan M, Handbook of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

I YEAR I -SEMESTER

BS104 DISCIPLINE SPECIFIC COURSE IA-
(DSC IA) BASICS OF BIOCHEMISTRY
(Practical)

PERIODS: 15 **NO. OF CREDIT-1**

I. Introduction to Qualitative and Quantitative of Nutrients

II. Carbohydrates:

1. Qualitative analysis of Glucose
2. Qualitative analysis of Fructose
3. Qualitative analysis of Maltose
4. Qualitative analysis of Sucrose
5. Qualitative analysis of Lactose
6. Qualitative analysis of Starch

III. PROTEINS

1. Qualitative analysis of Proteins

IV. MINERALS

1. Qualitative analysis of Minerals

SEMESTER 2 -NUTRITIONAL BIOCHEMISTRY

Credits: Theory-4, Practicals-2 Theory: 60 Lectures

COURSE OUTCOMES

Unit 1: Vitamins-

CO 1: Understand the importance of Fat-soluble vitamins in human nutrition, including their classification, sources, and the effects of excess and deficiency.

CO 2: Understand the importance of water-soluble vitamins in human nutrition, including their classification, sources, and the effects of excess and deficiency.

Unit 2: Minerals

CO 3: Understand the role of minerals in human nutrition, including their classification, sources, and comprehend the functions of minerals with health

CO 4: Understand the role of Zinc and Selenium as antioxidants.

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Unit 3: Water balance and Electrolyte balance

CO 5: Gain knowledge on Water metabolism: Distribution of water in body fluids, Regulation of water metabolism.

CO 6: Knowledge about acid base balance & imbalance in the body. Japanese Water Therapy.

Unit 4: Enzymes and Harmons

CO 7: Understand Role of Enzymes human physiology

CO 8: Understand Role of Hormones in human physiology

I YEAR II SEMESTER

BS 204 DISCIPLINE SPECIFIC COURSE IB- (DSC IB)

NUTRITIONAL BIOCHEMISTRY

CREDITS 4 **60 HOUR**

Unit I- VITAMINS **20 HOURS**

1.1 Fat soluble - A,D,E,K History, Chemistry, physiological functions, sources requirements, effects of deficiency.

1.2 Water soluble vitamins — B Complex — Thiamine, Riboflavin, Niacin, Pantothenic Acid, Folic Acid, Vitamin B 12, Biotin and Pyridoxine, Vitamin C- History, requirements, functions, sources, effect of deficiencies.

Unit II-MINERALS **16 HOURS**

2.1 Calcium, Phosphorous, Iron, Fluorine, Iodine. History, Chemistry, physiological functions, sources, requirements, deficiency.
2.2 Role of Zinc and Selenium as antioxidants.

Unit III-Water balance and electrolyte balance **12 HOURS**

3.1 Functions of water, water compartments in the body, distribution of water &electrolyte in the body. Regulation of water balance (over hydration & dehydration), regulation of electrolyte balance (hypo & hypernatremia, hypo & hyperkalemia), RAAS (Renin Angiotensin Aldosterone system), water intoxication
3.2 Acid base balance & imbalance, Japanese Water Therapy.

Unit IV-ENZYMES & HORMONE **12 HOURS**

4.1 **Enzymes** — Definition, classification, properties, mechanism of enzyme action, factors affecting enzyme action, enzyme inhibitions.

4.2 Hormones — Major endocrine glands and their secretions, classification, general mode of action, functions hypo & hyper secretion of — Insulin, Thyroxin, growth hormone, sex hormones.

REFERENCE BOOKS

- ✓ Nutrition science- B srilkashmi, New age international publishers, 2nd edition.
- ✓ A textbook of biochemistry, Dr. AVSS Rama Rao, 10th edition, UBS publishers Distribution pvt. Ltd.
- ✓ Biochemistry- U satyanaraya, U chakrapani, Books and Allied(P.Ltd)
- ✓ Helen A. Guthrie, Introductory Nutrition, Times MirrorMosby
- ✓ SwaminathanM, Advance Textbook on Food and Nutrition, Volume 1, The Bangalore printing and publishingco.,Ltd.
- ✓ Mudambi SR and Rajagopal M V, Fundamentals of food and Nutrition, Willey Eastern Ltd.
- ✓ Swaminathan M, Handbook of Food and Nutrition, The Bangalore Printing and Publishing Co. Ltd.

I YEAR II SEMESTER

NUTRITIONAL BIOCHEMISTRY (PRACTICAL)

NO. OF HOURS 15 **CREDITS-1**

I. **Quantitative analysis of carbohydrates**

- Estimation of reducing sugar by Benedict's method
- Estimation of Fructose by Roe's Resorcinol method

Il. Estimation of protein by Biuret method

III. Fats

Determination of saponification number of oil.

IV. Vitamins

- Estimation of ascorbic acid by 2,6, dichlorophenol, indophenols method. Estimation of ascorbic acid in lemon / cabbage / green chillies.

V. Minerals

SEMESTER 3 -& PAPER 3

FOOD SCIENCE & TECHNOLOGY

Credits: Theory-4, Practicals-2 Theory: 60 Lectures

COURSE OUTCOMES

Unit 1: Basics of Food Science, Cereals & Millets

CO 1: Understand the role of food in human nutrition and. Learn various cooking techniques and how to minimize nutritional loss while cooking.

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CO 2: Learn the significance of functional foods like cereals and millets and their role in cookery.

Unit 2: Pulses & Legumes, Milk & Milk Products

CO 3: Understand the importance of pulses and legumes and their role in cookery.

CO 4: Understand the significance of milk and milk products in cookery and gain knowledge about different types of fermented & non-fermented milk product

Unit 3: Fleshy Foods, Spices, Condiments & Beverages

CO 5: Acquire knowledge about different fleshy foods and their role in cookery.

CO 6: Understand the active compounds and medicinal properties of various spices and condiments used Indian cookery.

Unit 4: Vegetables & Fruits, Sugar & Jaggery, Fats & Oils

CO 7: Understand the composition and nutritive value of fruits and vegetables.

CO 8: Understand Role Sugar & jaggery and fats & oils in cookery.

B.SC. II YEAR & III-SEMESTER
BS 305 DSC-1C
PAPER III-FOOD SCIENCE & TECHNOLOGY (THEORY)
NO.OF HOURS: 60 **CREDITS:- 4**

CREDIT I: BASICS OF FOOD SCIENCE, CEREALS & MILLETS 15 Hours

1.1 Definition of food science and food technology. Brief objectives of cooking and cooking methods.
1.2 Cereals & millets: Cereal - (Rice and Wheat)-Structure, Nutritive value, Composition, role in cookery
1.3 Millets-Types of millets – Jowar & Maize
1.4 Milling of wheat and corn.
1.5 Role of gluten in dough formation, factors affecting gluten.

CREDIT II: PULSES & LEGUMES, MILK & MILK PRODUCTS 15 Hours

2.1 Pulses & legumes: Nutritive value, germination, Anti-nutritional factors, elimination, the role of pulses in cookery
2.2 Processing- Milling of pulses, legume protein concentrate, quick-cooking legumes.
2.3 Milk & milk products: types, nutritive value, composition, processing if milk, role in cookery.
2.4 Different types of Fermented & non-fermented milk product.
2.5 Processing of Cheese & Curd.
2.6 Processing of Paneer & Khoa.

CREDIT III: FLESHY FOODS, SPICES, CONDIMENTS & BEVERAGES 15 Hours

3.1 Fleshy foods (a) Meat: sources & types, nutrient composition, post mortem changes & processing of Meat-Ageing, tenderization and curing.
(b) Fish: Classification & types of fish, selection of fish.
(C) Eggs: Structure, composition, nutritive value, the role of egg in cookery
3.2 Spices and condiments: List of various spices and condiments in Indian Cookery Cinnamon, Clove, Fenugreek Seed, Ginger, Garlic, Onion, Turmeric, Fennel Seeds active compounds and medicinal values
3.3 Beverages – Definition, Classification, Processing- black tea, green tea and wine.

CREDIT IV: VEGETABLES & FRUITS, SUGAR & JAGGERY, FATS & OILS

15 HOURS

4.1 Vegetable: Classification, composition- pigments, organic acids, enzymes, flavor, compounds, Nutrition value.

4.2 Fruits: Definition, classification, composition- pigments, water content , cellulose & peptic substance, flavor constituents, polyphones, nutritive value, changes during ripening, enzymatic browning

4.3 Sugar & jaggery: sources, types, roles in cookery

4.4 Fats & oils: Sources, types, spoilage - rancidity, refining of oils, role in cookery

RECOMMENDED BOOKS:

1. Textbook of Sri Lakshmi B - food science 5th edition, New age international publishers, New Delhi – 110002, 2011

2. Norman Potter N - food science, CBS publishers & distributers, New Delhi – 110002, 2007

3. Food processing and preservation, G.Subbalakshmi and shobha A.Udipi, New age international publishers, 2010.

4. Food processing and preservation, G.Subbulakshmi and Shoba A. Udipi, New age international publishers, 2010

4. Food preservation and processing, Monoranjan Kalia, Sangita Sood, Kalyani publishers, New Delhi, 2018.

SUGGESTED READING:

1. Shankuntala Manays N - Foods Facts & Principles, New Age International Publishers, New Delhi - 110002, 2005

B.SC. II YEAR & III - SEMESTER
BS305, DSC-1C
PAPER III- FOOD SCIENCE & TECHNOLOGY (PRACTICALS)

Total No. of Practical's: 7

1. Demonstration of Standard Weights & Measures, Types of cut: Julienne, Chiffonade, Diagonal, Roll cut, Cubes and flower cut

2. Cookery Practical's in:

   i. Cereals & Pulses.

   ii. Milk & Its product, Fleshy Foods- Meat, Fish & Eggs

iii. Vegetables & Fruits.

4. Estimation of Gluten
5. Evaluation of Egg quality – candle test & floating test
6. Stage of sugar cookery:
    i. Thread – Gulabjamun
    ii. Softball – Barfi
    iii. Hard crack - Chikki

III-SEMESTER

PAPER- BS301, SEC-1

FOOD SERVICE MANAGEMENT

NO. OF HOURS 30 **CREDITS 2**

CREDITS I : MANAGEMENT OF FOOD & FOOD SERVICE ESTABLISHMENTS

15 Hours

1.1 Principles of management, types of food services institution - commercial & Non-commercial

1.2 Food management: Construction of the menu, Importance of menu planning, types of menu - A 'la carte ' table d'hôte, combination & food service style

CREDIT II: SETTING UP A FOOD SERVICE CREDIT & FINANCIAL MANAGEMENT **11 Hours**

2.1 Setting up food service; layout & design, planning team, architectural features, process flow, time managements.

2.2 Financial management: Component of Cost control, factors affecting losses

RECOMMENDED BOOKS:

1. Catering Management – An integrated approach – Mohini Sethi, Surjeet Malhan, 3rd edition , New Age International Publisher.

2. Institutional Food Management – Mohini Sheti, New Age International Publisher

III-SEMESTER
PAPER- BS302, SEC-2

Patient Counselling Skills

30 Hours
Hours/week 2 Credits 2

Credit I : Diet and Nutrition History 15 Hours

1.1 The Medical Record and Patient profile, Dietary Intake Assessment and Nutrition History: diet history, Food Frequency Questionnaire and 24 Hour recall.

1.2 Definition of Counseling, Nutrition counseling goals- the people involved, Communication process in counseling.

Credit II : Counseling skills, Weight Management 15 Hours

2.1 Counseling skills for behavior change, Developing behavior change strategies, Problems in Communication, Resources and Aids in Counseling.

2.2 Counseling for Weight Management- Assessment, Types of obesity, Causes, Counseling overweight and obese subjects.

Suggested Readings

Kathy King and Bridget Klawitter, Nutrition Therapy: Advanced Counseling Skills, Third Edition, Lippincott Williams and Wilkins, 2007.

Sylvia Escott Stump, Nutrition and Diagnosis – Related Care, Sixth Edition, Lippincott Williams and Wilkins, 2008.

Krause M, Kathleen. L Mahan and Sylvia Escott Stump, Food Nutrition and Diet Therapy, 11th Edition, W.B Saunders Co, Philadelphia, 2004.

SEMESTER 4 -PAPER 4

FAMILY & COMMUNITY NUTRITION

Credits: Theory-4, Practicals-2 Theory: 60 Lectures

COURSE OUTCOMES

Unit 1: Basics of Meal Planning

CO 1: Understand the concept of a balanced diet and RDA concept.

CO 2: Understand menu planning principles, and the needs of different physiological age groups.

Unit 2: Nutritional Requirement During Pregnancy, Lactation & Infancy

CO 3: Understand the changes and complications during pregnancy and nutrient requirements of pregnant and lactating women.

CO 4: Identify the many stages of infant development and growth. Acquire knowledge on factors to be considered while preparing & introducing supplementary foods.

Unit 3: Nutrient Requirement for Pre-Schoolers, School Going Child & Adolescent

CO 5: Identify feeding issues and factors affecting nutritional status in Preschoolers.

CO 6: Understand the nutritional concerns during pre-school, school going and adolescent ages, planning of packed lunches.

Unit 4: Nutrition Requirement for Geriatric Group & Nutritional Assessment

CO 7: Understand the nutritional needs of the elderly, basics and importance of Nutritional Assessment in clinical practice.

CO 8: Understand the method of Assessment of Nutritional status.

B.SC. II YEAR & IV-SEMESTER
BS 405, DSC-ID
PAPER – IV: FAMILY & COMMUNITY NUTRITION (THEORY)

NO. OF HOURS – 60 HOURS **CREDITS 4**

Credit I: Basics Of Meal Planning **(14 Hours)**

1.1 Definition of Balanced diets. RDA. Factors affecting RDA, ICMR recommendations.
1.2 Food pyramid, my food plate.
1.3 Food Exchange List (raw), food composition tables.
1.4 Principles & Objective of meal planning.
1.5 Nutrient requirement & meal planning for adults, changes in nutrient requirement according to sex, age & activity.

Credit II: Nutritional Requirement During Pregnancy, Lactation & Infancy **(16 Hours)**

Nutrient requirement & RDA for
2.1 Expectant mother- physiological changes, dietary modification & complications.
2.2 Lactation- general dietary guidelines & role of special foods.
2.3 Infancy- growth & development , breast feeding v/s artificial feeding. Factors to be considered while preparing & introducing supplementary foods.

Credit III : Nutrient Requirement For Pre Schoolers, School Going Child & Adolescent **(15 Hours)**

3.1 Preschoolers – problems in feeding. Factors affecting nutritional status.
3.2 School going child- the importance of breakfast, packed lunch & mid-day meal programs- ICDS, SNP.
3.3 Adolescence - eating disorder, anemia, anemia prophylaxis program.

Credit IV: Nutrition Requirement For Geriatric Group & Nutritional Assessment **(15 Hours)**

4.1 Geriatrics- RDA & Nutritional requirement during old age, physiological changes & dietary modification.
4.2 Nutritional Assessment – Method of Assessment of Nutritional status, Anthropometric, Biochemical, Clinical methods & Diet surveys.

REFERENCE BOOKS

1. Sri Lakshmi B -Dietetics New Age International Publisher, New Delhi - 110002, 2011.
2. Sri Lakshmi B -Nutrition science, 5th Edition, New Age International Publisher, New Delhi -110002, 2011

SUGGESTED BOOKS:

1. Mahtab.S.Bamji, Kamala Krishnaswamy, G.N.V Brahman - A text on human Nutrition, 3rd edition, Oxford & IBH publishing, Co. PVT. LTD. New Delhi.

B.SC. II YEAR & IV-SEMESTER

BS 405, DSC-ID

PAPER – IV FAMILY & COMMUNITY NUTRITION (PRACTICAL)

CREDIT 2 **TOTAL NO. OF PRACTICAL: 10**

1. Planning of diets
    a. Adult-according to sex & activity
    b. Pregnant & lactating women
    c. School going child.
    d. Adolescents.
    e. Old age group
2. Preparation of diets – 4 practical sessions
3. Formulation & Preparation of weaning mix

B.SC. II YEAR & IV - SEMESTER

BS 401, SEC-3

QUANTITY FOOD PRODUCTION

NO.OF HOURS – 30 HOURS **CREDITS: 2**

CREDIT I: QUANTITY FOOD PRODUCTION, PLANNING AND CONTROL

15 HOURS

1.1 Principles of food production-menu, ingredient control etc. production control - use of standardized recipes

1.2 Safeguarding Food Production - Quality control in food preparation, control of the microbial quality of food

CREDIT II: FOOD MANAGEMENT **15 HOURS**

2.1 Purchasing – market and the buyer, mode of purchasing, methods of purchase, Storage, Cooking equipment. Records necessary for catering

2.2 Methods of delivery- centralized. Types of service-table / counter, self, tray

BOOKS RECOMMENDED

I. Catering Management – An Integrated Approach – MOHINI SHETI, SURJEET MALHAN, 3rd edition, New Age International Publishers

2. Institutional Food Management – Mohini Sethi, New Age International Publishers.

3. Food Service Management, principal and practices, 13th edition - June Pyne Palacio, Monica thiece, person publishers

B.SC. II YEAR & IV -SEMESTER

SKILL ENHANCEMENT COURSE 4

NUTRITION AND FITNESS **30 Hrs**
Code BS 401, SEC- 4 **2 Hours/week Credits 2**

Credit I : Introduction, Types of exercise, physical activity 15 Hours

1.1 Definition of Physical fitness, Nutrition and health related fitness. General guidelines for Exercise, Guidelines for Healthy eating.

1.2 Nutritional recommendations for better physical performance. Nutritional supplements. Types of Exercise Programs

1.3 Physical Activity - frequency, intensity and types with examples.

Credit II : Management, Guidelines, Physical activity pyramid 15 Hours

2.1 Weight Management: Regulation of Body weight, Causes of overweight and obesity.

2.2 Assessment and dietary management of overweight and obesity. Physical Activity Guidelines and physical activity pyramid.

2.3 Popular diets and practices.

Suggested Readings

Wardlaw GM and Smith AM. Contemporary Nutrition: A Functional Approach. Mc Graw Hill.

Williams Melvin. Nutrition for health, fitness and sports. 2004. Mc Graw Hill

Kathleen Mahan, Sylvia Escott-Stump and Raymond JL, Krause's Food & the Nutrition Care Process, 13th Edition, Elsevier, ISBN: 978-1-4377-2233-8

Joshi AS. Nutrition and Dietetics 2010. Tata Mc Graw Hill.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS), BEGUMPET, HYDERABAD

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DEPARTMENT OF BOTANY

B.Sc. COURSE STRUCTURE, SYLLABUS, POs, PSOs & COs

CHOICE BASED CREDIT SYSTEM (2020-21)

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes:

PSO1. Find jobs at, food products, life oriented material industries, etc.

PSO2. Explicate ecological interconnectedness of life

PSO3: Analyse the avenues and remedies for burning environmental issues

PSO4. Recognize the relationships between different structures and functions at different levels

PSO5: Demonstrate applications of biochemical and biological sciences

PSO6: Inculcating proficiency in all experimental techniques and methods of analysis

PSO7: Acquire, articulate, retain and demonstrate laboratory safety skills

PSO8: Inculcate strong fundamentals on modern and classical aspects of Botany.

PSO9. Build life skills in Edible mushroom cultivation, Biofertilizer production and Greenhouse maintenance through skill enhancement courses.

PSO10. Create platform for higher studies in Botany.

PSO11. Facilitate students to take-up successful career in Botany

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A) BEGUMPET

HYDERABAD.

(AUTONOMOUS) CBCS

DEPARTMENT OF BOTANY

Code	Paper/ Title	Course Type	HPW	Credits
FIRST YEAR		SEMESTER - I		
BS 104	PAPER-I : Microbial Diversity and Lower Plants	DSC-1A	4T+2P=6	4+1=5
FIRST YEAR		SEMESTER - II		
BS 204	PAPER-II: Gymnosperms, Taxonomy of Angiosperms and Ecology	DSC-1B	4T+2P=6	4+1=5
SECOND YEAR		SEMESTER - III		
BS 301	SEC-1: Nursery and Gardening	SEC I	2	2
BS 302	SEC-2 Biofertilizers and Organic Farming	SEC II	2	2
BS 304	PAPER-III: Plant Anatomy and Embryology	DSC-1C	4T+2P=6	4+1=5
SECOND YEAR		SEMESTER - IV		
BS 401	SEC-3: Greenhouse Technology	SEC-3	2	2
BS 402	SEC-4: Mushroom Culture Technology	SEC-4	2	2
BS 404	PAPER-IV : Cell Biology, Genetics & Plant Physiology	DSC-1D	4T+2P=6	4+1=5

AECC: Ability Enhancement Compulsory Course, SEC: Skill Enhancement Course, GE:Generic Elective, DSC: Discipline Specific Core, DSE: Discipline Specific Elective.

Annexure – I (Credits)

Proposed CBCS Scheme for B.Sc w.e.f 2019-20)

Courses		Papers	Total Credits	Credits for each paper / Semester					
				B.Sc.					
				I	II	III	IV	V	VI
Core Courses DSC	Optional-1	4	20	5	5	5	5	-	-
	Optional-2	4	20	5	5	5	5	-	-
	Optional-3	4	20	5	5	5	5	-	-
Elective Courses DSE	Optional-1	2	10	-	-	-	-	5	5
	Optional-2	2	10	-	-	-	-	5	5
	Optional-3	2	10	-	-	-	-	5	5
Language	English(First Language)	5	20	4	4	3	3	3	3
	Second Language	5	20	4	4	3	3	3	3
Ability Enhancement Compulsory Course AECC	Environmental Science / Basic Computer Skills	1	2	2	-	-	-	-	-
	Basic Computer Skills / Environmental Science	1	2	-	2	-	-	-	-
Skill Enhancement Course SEC	SEC1	1	2	-	-	2	-	-	-
	SEC2	1	2	-	-	2	-	-	-
	SEC3	1	2	-	-	-	2	-	-
	SEC4	1	2	-	-	-	2	-	-
Generic Elective GE	Open Stream	1	4	-	-	-	-	4	-
Project Work/Optionals		1	4	-	-	-	-	-	4
Total Credits in each semester				25	25	25	25	25	25
Total Credits in UG				150					
Credits under Non-CGPA		NSS/NCC /sports/ Extra curricular	6	Up to 6 (2 in each year)					
		Summer Internship	4	Up to 4 (2 in each, after I & II years)					

Annexure II Proposed New Grading System

SGPA (SEMESTER GRADE POINT AVERAGE)			
S. No.	Grade Point	Range of marks	Grade Letter
1	10	Equal to and above 90 Marks	A+
2	9	More than or equal to 80 and less than 90 Marks	A
3	8	More than or equal to 70 and less than 80 Marks	B+
4	7	More than or equal to 60 and less than 70 Marks	B
5	6	More than or equal to 55 and less than 60 Marks	C+
6	5	More than or equal to 50 and less than 55 Marks	C
7	4	More than or equal to 40 and less than 50 Marks	D
8	0	Below 40 Marks	F

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A) BEGUMPET

(AUTONOMOUS) CBCS

DEPARTMENT OF BOTANY
First Year, I -Semester
Paper-I
Microbial Diversity and Lower Plants
DSC - 1A (4 hrs./week) Credits- 4
Theory Syllabus (60 hours)

Course Outcomes

After completion of the course the students are able to:

CO1.Understand the characteristics of bacteria and viruses

CO2. Understand the classification and characteristics of Algae and fungi

CO 3.Understand the morphological diversity of Bryophytes and Pteridophytes

CO 4. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.

CO 5. Know the evolution of Bryophytes and Pteridophytes

UNIT – I (15 hours)

1) Bacteria: Structure, nutrition, reproduction and economic importance. Brief account of Archaebacteria, Actinomycetes and Mycoplasma with reference to little leaf of Brinjal and Papaya leaf curl
2) Viruses: Structure, replication and transmission; plant diseases caused by viruses and their control with reference to Tobacco Mosaic and Rice Tungro.
3) An outline of plant diseases of important crop plants caused by bacteria and their control with reference toAngular leaf spot of cotton and Bacterial blight of Rice.

UNIT-II (15 hours)
1) General characters, structure, reproduction and classification of algae (Fritsch)
2) Cyanobacteria: General characters, cell structure their significance as biofertilizers with special reference to *Oscillatoria*, *Nostoc* and *Anabaena*.
3) Structure and reproduction of the following:Chlorophyceae- *Volvox*, *Oedogonium* and *Chara;*Phaeophyceae- *Ectocarpus*; Rhodophyceae- *Polysiphonia*.

UNIT-III (15 hours)

1) General characters and classification of fungi (Ainsworth).

2) Structure and reproduction of the following: (a) Mastigimycotina- *Albugo* (b) Zygomycotina- *Mucor* (c) Ascomycotina- *Saccharomyces* and *Penicillium* (d) Basidiomycotina- *Puccinia* (e) Deuteromycotina- *Cercospora*.

3) Economic importance of lichens

UNIT-IV (15 hours)

1) Bryophytes: **General characters of Bryophytes**, Structure, reproduction, life cycle and systematic position of *Marchantia*, *Anthoceros* and *Polytrichum*, Evolution of Sporophyte in Bryophytes.

2) Pteridophytes: **General chararcters of Pteridophytes**, Structure, reproduction, life cycle and systematic position of *Rhynia*, *Lycopodium*, *Equisetum* and *Marsilea*.

3) Stelar evolution, heterospory and seed habit in Pteridophytes.

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1) Alexopolous, J. and W. M. Charles. 1988. Introduction to Mycology. Wiley Eastern, New Delhi.

2) Mckane, L. and K. Judy. 1996. Microbiology – Essentials and Applications. McGraw Hill, New York.

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4) Pandey, B. P. 2007. Botany for Degree Students: Diversity of Microbes, Cryptogams, Cell Biology and Genetics. S. Chand & Company Ltd, New Delhi.

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6) Sambamurthy, A. V. S. S. 2006. A Textbook of Algae. I. K. International Pvt. Ltd., New Delhi.

7) Sharma, O. P. 1992. Textbook of Thallophyta. McGraw Hill Publishing Co., New Delhi.

8) Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.

9) Vashishta, B. R., A. K. Sinha and V. P. Singh. 2008. Botany for Degree Students: Algae. S. Chand& Company Ltd, New Delhi.

10) Vashishta, B. R. 1990. Botany for Degree Students: Fungi, S. Chand & Company Ltd, New Delhi.

11) Dutta A.C. 2016. Botany for Degree Students.Oxford University Press.

12) Watson, E. V. 1974. The structure and life of Bryophytes, B. I. Publications, New Delhi.

13) Pandey, B. P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany.

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14) Vashishta, P. C., A. K. Sinha and Anil Kumar. 2006. Botany - Pteridophyta (Vascular Cryptogams). . Chand & Company Ltd, New Delhi.

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17) Thakur, A. K. and S. K. Bassi. 2008. A Textbook of Botany: Diversity of Microbes and Cryptogams. S. Chand & Company Ltd, New Delhi.

18) Vashishta, B. R., A. K. Sinha and Adarsha Kumar. 2008. Botany for Degree Students: Bryophyta. S. Chand & Company Ltd, New Delhi.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A) BEGUMPET
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year, I -Semester
Paper-I
Microbial Diversity and Lower Plants
Practical Syllabus (45 hours)

1. Study of viruses and bacteria using electron micrographs (photographs).

2. Gram staining of Bacteria.

3. Study of symptoms of plant diseases caused by viruses, bacteria, Mycoplasma and fungi:

Viruses: Tobacco mosaic

Bacteria: Angular leaf spot of cotton and Rice tungro.

Mycoplasma: Little leaf of Brinjal and Leaf curl of papaya

Fungi: White rust on Crucifers, Rust on wheat &Tikka disease of Groundnut.

4. Vegetative and reproductive structures of the following taxa:

Algae: *Oscillatoria*, *Nostoc*, *Volvox*, *Oedogonium*,*Chara*,*Ectocarpus* and *Polysiphonia*.

Fungi: *Albugo*, *Mucor*,*Saccharomyces*, *Penicillium*, *Puccinia* and *Cercospora*

5. Section cutting of diseased material infected by Fungi and identification of pathogens as per theory syllabus. White rust of Crucifers, Rust on wheat &Tikka disease of Groundnut.

6. Lichens: Different types of thalli and their external morphology

7. Examination of important microbial, fungal and algal products: Biofertilizers, protein capsules, antibiotics, mushrooms, Agar-agar etc.

8. Field visits to places of algal / microbial / fungal interest (e.g. Mushroom cultivation, water bodies).

9. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Bryophytes: *Marchantia*, *Anthoceros* and *Polytrichum*.

10. Study of Morphology (vegetative and reproductive structures) and anatomy of the following Pteridophytes: *Lycopodium*, *Equisetum* and *Marsilea*.

11. Study of Anatomical features of *Lycopodium* stem, *Equisetum* stem and *Marsilea* petiole& rhizome by preparing double stained permanent mounts.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year, I –Semester Paper-I
Practical Model Paper Max.Marks: 50
Time : 3 hrs

1. Identify the given components 'A'&'B' in the algal mixture .

Describe with neat labeled diagrams & give reasons for the classifications. 2 X 4 = 8M

2. Classify the given bacterial culture 'C' using Gram – staining technique. 6M

3. Take a thin transverse section of given diseased material 'D'.

Identify & describe the symptoms caused by the pathogen. 8M

4. Identify the given specimens 'E', 'F' & 'G' by giving reasons .

(Fungal-1, Bacteria-1 & Viral-1) 3 X 2 = 6M

5. Comment on the given slides ‘H’ & ‘I’ (Algae-1, Fungi-1) 2 X 4 = 8M

6. Identify the given specimen ‘J’ & slide ‘K’ (Bryophytes & Pteridophytes) 2 X 4 = 8M

7. Record & Viva 6M

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year, II -Semester
Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology
DSC-1B Credits-4
Theory Syllabus (60 hours)

Course Outcomes

After completion of the course the students are able to:

CO1. Understand the diversity of Gymnosperms and economic importance.

CO2. Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features

CO3**.** Know the conceptual development of “taxonomy” and “systematics”

CO4. Learn the types of classifications- Natural and phylogenetic.

CO5. Learn about the characters of biologically important families of angiosperms.

CO 6. Know the floral variations in angiospermic families, their phylogeny and evolution.

CO 7. Understand various rules, principles and recommendations of plant nomenclature in plant identification.

CO8. Understand the concept, components, energy flow in an ecosystem, food chain and food web

CO9. Study of herbarium techniques.

CO 10. Learn the taxonomic evidences from cytological, embryological, numerical and chemicals aspects

UNIT-I (15 hours)

1) Gymnosperms: **General charactersof Gymnosperms,** structure, reproduction and classification (Sporne's). Distribution and economic importance of Gymnosperms.
2) Morphology of vegetative and reproductive parts, systematic position and life cycle of *Pinus* and *Gnetum*.
3) Geological time scale Introduction to Palaeobotany, Types of fossils and fossilization, Importance of fossils.

UNIT-II (15 hours)
1) Introduction: Principles of plant systematics, Types of classification: Artificial, Natural and Phylogenetic; Systems of classification: Salient features and comparative account of Bentham & Hooker and Engler&Prantl classification systems. An introduction to Angiosperm Phylogeny Group (APG).
2)Current concepts in Angiosperm Taxonomy: Embryology in relation to taxonomy Cytotaxonomy, Chemotaxonomy and Numerical Taxonomy.
3) Nomenclature and Taxonomic resources: An introduction to ICN, Shenzhen code – a brief account. Herbarium: Concept, techniques and applications.

UNIT-III (15 hours)
1) Systematic study and economic importance of plants belonging to the following families:
Polypetalae: Annonaceae, Capparidaceae, Rutaceae, Fabaceae (Faboideae/Papilionoideae, Caesalpinioideae, Mimosoideae), Cucurbitaceae
2)Gamopetalae: Apiaceae, Asteraceae, Asclepiadaceae, Lamiaceae, Monochalmydeae: Amaranthaceae, Euphorbiaceae
3) Monocotyledons: Orchidaceae, Poaceae and Zingeberaceae.

UNIT-IV (15 hours)
1. Component of Eco system, energy flow, food chain and food webs.
2. Plants and environment, ecological adaptations of plants, Hydrophytes, Xerophytes and Mesophytes
3. Plant Succession serial stages, modification of environment, climax formation with reference to Hydrosere and Xerosere.

References:

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2. Pandey, B. P. 2006. College Botany, Vol. II: Pteridophyta, Gymnosperms and Paleobotany. S. Chand & Company Ltd, New Delhi.
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5. Pandey, B. P. 2001. College Botany, Vol. I: Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. S. Chand & Company Ltd, New Delhi.
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GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year, II -Semester
Paper-II
Gymnosperms, Taxonomy of Angiosperms and Ecology
Practical Syllabus (45 hours)

1. Study of Morphology (vegetative and reproductive structures) of the following taxa: Gymnosperms - *Pinus* and *Gnetum*.

2. Study of Anatomical features of *Pinus* needle and *Gnetum* stem by preparing double stained permanent mounts.

3. Fossil forms using permanent slides / photographs: Cycadeoidea.

Systematic study of locally available plants belonging to the families prescribed in theory Syllabus (Minimum of one plant representative for each family)

4. Study of morphological and anatomical characteristics of locally available plant species.

(*Eichhornia*, *Hydrilla*, *Pistia*, *Nymphaea, Asparagus*, *Opuntia*, *Euphorbia melii*)

5. Demonstration of herbarium techniques.

6. Candidate has to submit at least 30 herbarium sheets.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year, II -Semester
Paper-II Practical Model Paper

Time: 3 hrs

Max. Marks: 50

1. Prepare a mount of the given material 'A' (Hydrophytes /Xerophytes)

   Draw diagram & give reasons for identification. 8M

2. Prepare a double stained permanent mount of the given material 'B' (Gymnosperms)

   Draw diagram & give reasons for identification. 10M

3. Identify the given specimens C & D (Gymnosperms /Xerophytes) 2 X 4 =8M

4. Identify the given slides E&F (Gymnosperms /Xerophytes) 2 X 4 =8M

5. Technical description of the given plant twig ‘A’10M

6. Herbarium 3M

7. Record 3M

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
First Year & II Year
Paper-II Theory Model Question Paper
For DSC & DSE

Time:2.30 hrs Max. Marks: 60

Draw well-labeled diagrams wherever necessary.

I. Write short answer for any 5 of the following 5 X 4 = 20M

a. e.

b. f.

c. g.

d. h.

II. Essay Questions: 4X 10 = 40M

1. a. (OR) b.

2. a. (OR) b.

3. a. (OR) b.

4. a. (OR) b.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMP(AUTONOMOUS) CBCS

DEPARTMENT OF BOTANY B.Sc. BOTANY

II Year: Semester-III

Paper – III: Plant Anatomy and Embryology

DSC- 1C **Credits: 4**

Theory Syllabus **(60 hours)**

Course Outcomes

After completion of the course the students are able to:

CO1. Develop an understanding of concepts and fundamentals of plant anatomy

CO2. Examine the internal anatomy of plant systems and organs

CO3. Develop critical understanding on the evolution of concept of organization of shoot and root apex.

CO4. Identify and compare structural differences among different taxa of vascular plants.

CO6. Learn about double fertilization and their significance

CO 7. Know the structure and development of monocot and dicot embryos.

UNIT–I **(18h)**

1. Meristems: Types, histological organization of shoot and root apices and theories.
2. Tissues and Tissue Systems: Simple, complex and special tissues.
3. Leaf: Ontogeny, diversity of internal structure; stomata and epidermal out growths.
4. General account of adaptations in xerophytes and hydrophytes.

UNIT-II **(16h)**

5. Stem and root anatomy: Vascular cambium - Formation and function.
6. Anomalous secondary growth of Stem - *Achyranthes*, *Boerhaavia*, *Bignonia*,

Dracaena; Root– *Beta vulgaris*

7. Wood structure: General account. Study of local timbers- Teak (*Tectona grandis*), Rosewood (*Dalbergia latifolia*), Red sanders (*Pterocarpu ssantalinus*), Nallamaddi (*Terminalia tomentosa*) and Neem (*Azadirachta indica*).

UNIT–III **(10h)**

8. History and importance of Embryology.
9. Anther structure, Microsporogenesis and development of male gametophyte.
10. Ovule structure and types; Megasporogenesis; types and development of female gametophyte.

UNIT-IV **(16h)**

11.Pollen morphology, pollination and fertilization, Pollination Types, Pollen – pistil interaction, Double fertilization.

12. Seed – structure appendages and dispersal mechanisms

13.Endosperm – Development and types. Embryo development and types; Polyembryony and Apomixis – anoutline.

14.Palynology: Pollen morphology, NPC system, Applications of Palynology.

References:

1. Bhattacharya et. al. 2007. A textbook of Palynology, Central, NewDelhi.
2. Bhojwani, S. S. and S. P. Bhatnagar. 2000. The Embryology of Angiosperms (4th Ed.), Vikas Publishing House,Delhi.
3. M.R.Saxena- A textbook of Palynology.
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GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY B.Sc. BOTANY

B.Sc. BOTANY
II Year: Semester-III

Paper – III: Plant Anatomy and Embryology

DSC-1C **Credits-1**

Practical syllabus (45 hours)

1. Demonstration of double staining technique.
2. Tissue organization in root and shoot apices using permanent slides
3. Preparation of double stained Permanent slides

   Primary structure: Root - *Cicer, Canna;* Stem- *Tridax, Sorghu*m Secondary structure: Root – *Tridax* sp.; Stem- *Pongamia*

   Anomalous secondary structure: Examples as given in theory syllabus.
4. Anatomy of Xerophyte (*Nerium* leaf); Hydrophyte (*Hydrilla* stem).
5. Stomatal types using epidermal peels.
6. Structure of anther and microsporogenesis using permanent slides.
7. Structure of pollen grains using whole mounts - *Hibiscus, Acacia* and Grass).
8. Pollen viability test using Evans Blue –*Hibiscus*
9. Study of ovule types and developmental stages of embryosac.
10. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot embryos using permanent slides.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
B.Sc. BOTANY

Practical Model Paper

Time: 3hrs Max. marks: 50

1. Identify the given material"**A**", Prepare a double stained permanent mount of transverse section of given material.

15M

2. Prepare a temporary mount of epidermal peel of the given leaf material "**B**" and identify the stomatal type .

7M

3. Conduct the pollen viability test "**C**" (OR) Isolate the embryo from the given material.

6M

4. Identify and describe the specimens / slides with well labeled diagrams

(a) Embryology – **D** (b) Palynology – **E** (c) Anatomy – **F** 3 X 4 =12M

5. Record 5M

6. Viva 5M

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY

B.Sc. Botany

II Year: Semester-III

Skill Enhancement Course SEC-1(Credits -2)

Course Outcomes:

After completion of the course the students are able to:

CO1. Learn the importance of Nursery and Gardening, the career and occupational opportunities

CO2. Learn the techniques of gardening - Types, Operations

CO3. Acquire sufficient academic and practical experiences and become self-employed in the nursery ventures.

CO4.The students learn about how to prepare suitable soil media for potting up, seedling and cutting.

CO5. Acquire the skills like germinating seed and transplant seedlings and cutting into pots

CO6. Understand the entrepreneurial skills in nursery technology

Nursery and Gardening

Lectures: 30

Unit-I (15h)

1. Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants.
2. Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion - Seed production technology - seed testing and certification.
3. Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants –greenhouse - mist chamber, shed root, shade house and glass house.

Unit-II (15h)

4. Gardening: definition, objectives and scope - different types of gardening -landscape and home gardening - parks and its components - plant materials and design - computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.
5. Sowing/raising of seeds and seedlings - Transplanting of seedlings – Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes and carrots - Storage and marketing

   Features of a garden: Garden wall, Fencing, biofencing, Steps, Hedge, Edging, Lawn, Flower beds, Shrubbery, Borders, Water garden. Some Famous gardens of India Cultivation of Important cut flowers: Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Lilium, Orchids.

* Field trip is essential.

Suggested Readings

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford &IBH Publishing Co., NewDelhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore,Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco,USA.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.

(AUTONOMOUS) CBCS

DEPARTMENT OF BOTANY

B.Sc. Botany

II Year: Semester-III

SEC-2 (Credits -2)

Biofertilizers and Organic Farming (30h)

Course Outcomes:

After completion of the course the students are able to:

CO1. Study the method of large scale production of biofertilizer & Organic farming

CO2. Learn the characteristics, identification, cultural methods and maintenance of Azolla and Anabaena.

CO3. Know about Mycorrhiza – VAM association, types, occurrence, collection, isolation and inoculum production.

CO4. Acquire the knowledge regarding biofertilizers and its consequences in the environment.

CO5. Develop skill regarding isolation, identification and mass production of bacterial biofertilizers.

CO6. Develop skill on blue green algal biofertilizer production and its application.

CO7. Students get the awareness to mitigate the usage of synthetic fertilizers.

CO8. Learn about the benefits of organic farming and its relation to waste management.

Greenhouse Technology

UNIT-I:

(15h)

1. Manures and Biofertilizers: Types of fertilizers, manures. Manure composition. Manures for crop productivity.
2. Differences between fertilizers and biofertilizers: pH changes and water contamination.
3. Bacterial Biofertilizers: General account on the microbes used as biofertilizer.
4. Algal Biofertilizers: Associative effect of different microorganisms. *Azolla* and *Anabaena-azollae*
   association, nitrogen fixation, factors affecting growth, *Azolla* in rice cultivation.

UNIT- II:

(15h)

5. Fungal Biofertilizers: Mycorrhizal association, types of mycorrhizal association, occurrence and distribution, phosphorus nutrition, growth and yield, colonization of VAM – isolation and inoculum production of VAM, and its influence on growth and yield of crop plants.
6. Organic Farming: Green manuring and organic fertilizers, Recycling of bio-degradable municipal, agricultural and industrial wastes, Bio compost making- types, method of vermin composting, Panchakavya. Biological pest control (neem).

Suggested Readings

1. Dubey R.C. 2005. A Text book of Biotechnology. S.Chand& Co. New Delhi.
2. Kumaresan V. 2005. Biotechnology. Saras Publications. New Delhi.
3. John JothiPrakash E. 2004. Outlines of Plant Biotechnology.
   Emkay Publication. New Delhi.
4. Sathe T.V. 2004. Vermiculture and Organic Farming. Daya Publishers. New Delhi.
5. SubhaRao N.S. 2000. Soil Microbiology, Oxford &IBH Publishers. New Delhi.
6. Vayas S.C, Vayas S. and Modi H.A. 1998.Bio-fertilizers and
   organic Farming Akta Prakashan.Nadia

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.

(AUTONOMOUS) CBCS

DEPARTMENT OF BOTANY

II YEAR: Semester-IV

Paper IV: Cell Biology, Genetics and Plant Physiology

DSC-1D Credits-4

Theory Syllabus (60 hours)

Course Outcomes

After completion of the course the students are able to:

CO1. Know the structure of Cell wall components, Nucleus and their functions.

CO2 . Understand cell division types in plants.

CO3**.** Acquire the knowledge law of inheritance and genetic interaction

CO4. Understand linkage , crossing over and mutations .

CO5. Understand water relation of plants with respect to various physiological processes.

CO 6. Understand the nutrient deficiency symptoms in plants

CO 7. Understand the process of Photosynthesis and respiration

.

UNIT-I: (15h)

1. Plant cell envelops: Ultra structure of cell wall, Models of membrane structure, structure and functions of Semi permeable Plasma membrane.
2. Cell Organelles: Structure and semiautonomous nature of Mitochondria and Chloroplast.
3. Nucleus: Ultra structure, types and functions of DNA &RNA. Mitochondrial DNA & Plastid DNA and Plasmids.
4. Chromosomes: Morphology, organization of DNA in a chromosome, Euchromatin and Heterochromatin, Karyotype. Special types of chromosomes: Lampbrush and Polytene chromosomes.
5. Cell division: Cell and its regulation; mitosis, meiosis and their significance

UNIT–II (15h)

1. Mendalism: History, Principles of inheritance, Chromosome theory of inheritance, Autosomes and sex chromosomes, Incomplete dominance and Co-dominance. Multiple alleles, Lethal alleles, Epistasis, Recessive and Dominant traits, Polygenic inheritance.
2. Linkage and crossing over, Recombination frequency, two factor and three factor crosses; Interference and coincidence. Numericals based on gene mapping; Sex Linkage.
3. Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy
4. Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens-physical and chemical (Base analogs, deaminating, alkylating and inter chelating agents);

Unit-III

(15h)

5. Plant -water Relations: Water potential, osmosis, osmotic and pressure potential, absorption and transport of water.
6. Mineral Nutrition: Essential micro & macro nutrients and symptoms of mineral deficiency.
7. Transpiration: Stomatal structure and movement.
8. Mechanism of phloem transport.
9. Enzymes: Nomenclature, properties, Classification, Mechanism of enzyme action**.** Factors regulating enzyme activity.

UNIT- IV (15h)

10. Photosynthesis: Photosynthetic pigments, Cyclic and Non-cyclic Photo phosphorylation. Carbon assimilation pathways: C3, C4 and CAM.
11. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle and oxidative phosphorylation.
12. Nitrogen Metabolism: Biological nitrogen fixation. **Protein Synthesis, Mechanism of Protein Synthesis.**
13. Physiological role of Phytohormones: Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids

Reference:

1. Sharma, A. K. and A. Sharma. 1999. Plant Chromosomes: Analysis, Manipulation and Engineering. Harward Academic Publishers, Australia.
2. Shukla, R. S. and P. S. Chandel. 2007. Cytogenetics, Evolution, Biostatistics and Plant Breeding. S.Chand& Company Ltd., New Delhi.
3. Verma, P. S. and V. K. Agrawal. 2004. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd., New Delhi.1. Hopkins, W. G.1995.Introduction to Plant Physiology. John Wiley & Sons Inc., New York,USA

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8thedition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10thedition.
5. Watson J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6thedition.
6. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.
7. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.
8. Russell, P. J. (2010). iGenetics- A Molecular Approach. Benjamin Cummings, U.S.A. 3rdedition.
9. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.
10. Jain, J.L., S. Jain and Nitin Jain. 2008. Fundamentals of Biochemistry. S. Chand & Company Ltd., New Delhi.
11. Pandey, B. P. 2007. Botany for Degree Students: Plant Physiology, Biochemistry, Biotechnology, Ecology and Utilization of Plants. S. Chand & Company Ltd., New Delhi.
12. Salisbury, F. B. and C. W. Ross. 1992. Plant Physiology. 4thedn. (India Edition), Wordsworth, Thomson LearningInc.,USA.
13. Taiz, L. and E. Zeiger. 1998. Plant Physiology (2nd Ed.). Sinauer Associates, Inc., Publishers, Massachusetts, USA.
14. Dutta A.C. 2016. Botany for Degree Students. Oxford University Press.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
II YEAR: Semester-IV

Paper IV: Cell Biology, Genetics and Plant Physiology

DSC-1D Credits-1 Practical Syllabus (45 hours)

1. Demonstration of cytochemical methods: Fixation of plant material and nuclear staining for mitotic and meiotic studies.
2. Study of various stages of mitosis using cytological preparation of Onion root tips.
3. Study of ultra structure of cell organelles using photographs. Chloroplast, Mitochondria, Nucleus,
4. Study of Special types of Chromosomes (Polytene chromosome and Lampbrush chromosomes- Permanent slide)
5. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
6. Chromosome mapping using test cross data.
7. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1,9:3:4)
8. Determination of osmotic potential of vascular sap by Plasmolytic method using leaves of *Rheodiscolor*/*Tradescantia.*
9. Determination of rate of transpiration using Cobalt chloride method
10. Determination of stomatal frequency using leaf epidermal peelings /impressions
11. Determination of amylase activity using potato tubers by titration method
12. Separation of chloroplast pigments using paper chromatography technique
13. Estimation of protein by Biurette method
14. Mineral deficiency symptoms of Micro and Macronutrients

Practical Model Question Paper

Time:3 hrs **Max. marks: 50**

1. Prepare a cytological slide of given material "A" and identify& describe any two stages with well labeled diagrams. (12M)
2. Genetics problem (10M)
3. Physiology Experiment (12M)
4. Identify and Comment on A&B (2x3=6M)
   A. Micronutrient / Macronutrients Deficiency symptoms
   B. Cell organelles / Special type of Chromosomes
5. Record (5M)
6. Viva (5M)

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY

B.Sc. BOTANY II Year: Semester-IV

Skill Enhancement Course

SEC-3 **Credits-2**

Green house Technology (30h)

Course Outcomes:

After completion of the course the students are able to:

CO1. Understand the basic concepts of greenhouse technology.

CO2. Acquire knowledge on fertilizer application and irrigation systems in greenhouses.

CO3. Know about diseases of greenhouse plants.

CO4. Understand integrated pest management

UNIT-I: (15h)

1. Introduction; scope – classification of greenhouses – construction of green house- heating unit – cooling unit – environmental control (light and temperature).
2. Net- poly houses- low cost green houses. Root media for green houses
3. Fertilizers: Organic and inorganic, liquid fertilizers, application of fertilizers.
4. Water in the Greenhouses: Irrigation system in green houses–misting, Drip irrigation- micro irrigation, water quality, water sanitation.

UNIT-II (15h)

5. Plant Protection in Greenhouses: Diseases of greenhouse plants (bacterial, fungal, nematodes and viral diseases)
6. Management of pest and diseases – integrated pest management.
7. Applications of Greenhouse Technology: Importance of greenhouse technology. Micropropagation and greenhouse planting of tissue culture transplants
8. Advantages and disadvantages of greenhouse technology. Seed production, cut flower gardening.

Suggested Readings

1.Dubey R.C. 2006. A text book of Biotechnology. S.Chand and Company. New Delhi.

1. Sheela V.L. 2011. Horticulture.MJP Publishers. Chennai,
2. Prasad S., Kumar U. 2012. Green House Management for Horticultural Crops. Agrobios India.
3. Pant V. and Nelson. 1991. Green House Operation and Management. Bali Publication. New Delhi.
4. Introduction to soil science: http://www.agrimoon.com/wpcontent/uploads/Introduction-tosoil- science.pdf
5. Greenhouse applications: http://www.lindegas.com/en/products_and_supply/fumigants/carbondioxide_in_agriculture/greenhouse_applications/index.html
6. Role of greenhouse technology in agricultural engineering:

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY

B.Sc. BOTANY

II Year: Semester-IV

Skill Enhancement Course

SEC-4 **(Credits2)**

Course Outcomes:

After completion of the course the students are able to :

CO1. Acquire an adequate knowledge about mushroom types, medicinal value

CO2. Acquire the knowledge of nutritional value, cultivation unit and storage methods.

CO3. Learn about mushroom cultivation technology -spawn and spawning techniques.

CO4. Understand the factors influencing the mushroom cultivation and post harvesting methods.

CO5. Acquire sufficient academic and practical experiences and become self- employed

Mushroom Culture Technology

Lectures:30

UNIT-I(15h)

1. Introduction & history. Medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India –*Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus.*
2. Cultivation Technology: Infrastructure; substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag.
3. Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves.
4. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production.

UNIT-II (15h)

5. Storage: Short-term storage (Refrigeration – up to 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions.
6. Nutritional value of Mushrooms: Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content -Vitamins.
7. Food Preparation: Types of foods prepared from mushroom. Research Centres -National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

Suggested Readings

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore -560018.
3. Tewari, PankajKapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.
4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I &Vol.II.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
B.Sc. BOTANY Syllabus-Total Hrs of Teaching 45 @ 3HRS/WEEK
III YEAR-SEMESTER-V-PAPER-V(DSC)
(CELL BIOLOGY AND GENETICS)

Course Outcomes:

After completion of the course the students are able to:

CO1. Know the structure of Cell wall components, nucleus and their functions.

CO2 . Understand cell division in plants.

CO3. Acquire the knowledge of law of inheritance and Genetic interactions

CO4. Understand Chromosome morphology

CO5. Know about linkage , crossing over and mutations .

CELL BIOLOGY

UNIT-I **(10HRS)**

1.PLANT CELLENVELOPS:- Ultra structure of cell wall, molecular organization of cell membranes.
2. NUCLEUS:- Ultra structure, Nucleic acids- structure and replication of DNA; types and functions of RNA.

UNIT-II **(13HRS)**

3.CHROMOSOMES:- Morphology ,Organization of DNA in a chromosome, Euchromatin and Heterochromatin, Karyotype. Special types of chromosomes (Lamp brush, polytene and B-chromosomes).

4. Cell Division: Mitosis, Meiosis, cell cycle and its regulation, Hypertrophy and Hyperplasia.

GENETICS

UNIT-III **(12HRS)**

5.MENDELISM:- Genetic interactions/Modified Mendelian Ratios (Epistasis, complimentary supplementary and Inhibitory genes).

6.LINKAGE AND CROSSING OVER:- A brief account , construction of genetic maps,2-point and 3-point Test cross data.

7. MUTATIONS :-Chromosomal aberrations-structural and numerical changes; Gene mutations

UNIT-IV **(10HRS)**

8.GENE EXPRESSION AND EXTRA NUCLEAR GENOME: - organization of gene, transcription, translation, mechanism and regulation of gene expression in prokaryotes(Lac and Trp operon).

9.Mitochondrial (mt DNA),(cp DNA) and Plasmids.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY B.Sc. BOTANY
MODEL QUESTION PAPER AND SCHEME FOR VALUATION
B.Sc. III yr CBCS-BOTANY
Practical Paper-V: Cell Biology and Genetics

Time: 2 1/2 Hrs. Max.Marks:50

1. Carry out the cytological preparation and staining of the given material and report any two stages of cell division to the examiners. 16M

   Scheme for valuation: Procedure-3+ Slide preparation-6+ Observation or recording of results

   Figure-3, Inference-3

2. Solve the Three given genetic problems.(Out of 15 Genetic problems) 3x8=24M

   Scheme for valuation for each problem: Solution 3+Inference-2

3. RECORD 5M

4. Viva Voce 5M

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
Syllabus-Total Hrs of Teaching 45
B.sc. III YEAR -SEMESTER-V -PAPER-V I DSE-1
(ECOLOGY AND BIODIVERSITY)

Course Outcomes:

After completion of the course the students are able to :

CO1. Understand the interaction between biotic and abiotic components of the environment.

CO2 . Know about the concept of energy flow in the ecosystem

CO3. Understand the various concepts of Biodiversity, values and factor influence its loss

CO4. Identify the threats to biodiversity and its habitat loss.

CO5. Understand the need for conservation of biodiversity

ECOLOGY

UNIT-I (16Hrs)

1.CONCEPTS and COMPONENETS OF ECOSYSTEM:- Energy flow , food chains, food webs, ecological pyramids, Biogeochemical cycles –Carbon cycle (4h)
2.Definition of Environment; Atmosphere, Hydro sphere, lithosphere and Biosphere(3h)
3.PLANTS AND ENVIRONMENT:-Ecological factors-Climatic (light and temperature), and biotic, Ecological adaptations of plants. (5h)
4.Edaphic factors; Soil-formation, weathering, mode of formation; transported; Colluvial, Alluvial, Glacial and Eolian. Soil Erosion and Conservation (4h)

UNIT-II

5. POPULATION ECOLOGY:-Natality, mortality, growth curves, ecotypes and ecads (4h)
6. COMMUNITY ECOLOGY:- Frequency, density, cover, life forms, biological spectrum, ecological succession (Hydrosere, xerosere). (4h)
7. Community Dynamics: Succession-Serial stages, Modification of physical environment, climax formation with reference to Hydrosere and xerosere. (4h)
8. Production Ecology: Concepts of productivity- Primary and secondary productivity.(4h)

BIODIVERSITY

UNIT-III (6hrs)

9. BIODIVERSITY; Concepts, convention on biodiversity-Earth Summit.(Copenhagen)
10. Biodiversity: Levels, threats and Value
11. **Flora of Telangana: Vegetation and Endemics.**

UNIT-IV
(7hrs)
12. Hot Spots of India- North Eastern Himalayas, Western Ghats, Endemism IUCN Categories Red Data Book
13. PRINCIPLES OF CONSERVATION:- IUCN threat- categories, RED data book- threatened & endangered Plants of India. Role of organizations in the conservation of biodiversity-WWF& NBPGR

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.

(AUTONOMOUS) CBCS
B.Sc. III - BOTANY
QUESTION BANK
Practical Paper-VI Advanced Elective -1
Ecology and Biodiversity

1. Carryout analysis of the water sample and estimate the amount of carbonates

(OR) Bicarbonates

2. Carry out analysis of the Soil PH and Soil Texture

3. Critical notes on (FIVE) spotters of scientific interest

1. *Hydrilla*
2. *Pistia*
3. *Nymphea*.
4. *Vallisnaria*
5. *Asparagus*.
6. *Aloe vera*
7. *Euphorbia antiquorum*.
8. *Opuntia*
9. *Casuarina.*

10. *Nerium* leaf.
11. *Rhizophora.*
12. *Avecenia*.

SLIDES:

13. *Hydrilla* stem.
14. *Nymphaea* petiole. T.S.
15. *Vallisnaria* leaf T.S.
16. *Asparagu*s cladodeT.S.
17. *Nerium*, leaf T.S.
18. *Casuarina*stem T.S.
19. *Rhizophora* pneumatophores T.S.
20. *Avecennia* leaf T.S.

5. Record
6 VIVA VOCE (INTERACTIVE TESTING)

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.

(AUTONOMOUS) CBCS
B.Sc. III - BOTANY
QUESTION PATTERN
Practical Paper-VI DSE -1
Ecology and Biodiversity

Time:2 ½ Max.Marks:50

1. Carryout analysis of the water sample and estimate the amount of carbonates (OR) Bicarbonates. 15M
2. Carry out analysis of the Soil PH and Soil Texture.10 M
3. Critical notes on (FIVE) spotters of scientific interest 5x3 =15 M
4. Record 5M
5. VIVA VOCE (Interactive Testing) 5M

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET-HYDERABAD.
(AUTONOMOUS)CBCS
DEPARTMENT OF BOTANY
Semester-V: Elective

B.Sc. III Year Semester-V
Economic Botany
GE-1E (2 hrs/week) Credits-2 Generic Elective-I 30 hours

Course Outcomes:

After completion of the course the students are able to:

CO1. Know the economical important plants with special reference to the Botanical name, family, morphology of useful part and the uses

CO2. Learn about oil yielding and fiber yielding plants.

Theory Syllabus

Unit-I:

1. Cultivated Plants: Concept of origin, their importance.
2. Vegetables: Nutritional and Commercial values of Root crops, leafy and fruit vegetables.
3. Cereals: Rice, Wheat and maize -Origin, morphology and uses
4. Pulses: General account with special reference to Gram and soybean
5. Millets: Nutrient significance of Sorghum, Finger millet, Pearl millet, Foxtail millet.

Unit-2:

6. Spices: General account with special reference to clove and black pepper.
7. Fruits and nuts: Commercial and nutritional value of South Indian fruits. Cashew nut, Almond and Walnut.
8. Beverages: Tea & Coffee - morphology, processing, uses.
9. Oils and Fats: General description with special reference to groundnut and sunflower
10. Fiber Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses)

Suggested Readings

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, Mac Millan Publishers India Ltd., New Delhi.4th edition.

2. B.P. Pandey (2007). Economic Botany, S. Chand & Company Ltd. New Delhi. 17/e.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET-HYDERABAD.

(AUTONOMOUS)CBCS
DEPARTMENT OF BOTANY
B.Sc. III Year Semester-V
Skill Enhancement Course
SEC-3 (2 hrs/week) (Credits 2) Lectures: 30
Nursery and Gardening

Course Outcomes:

After completion of the course the students are able to :

CO1. Know the importance of Nursery and Gardening, the career and occupational opportunities

CO2. Know the techniques of gardening - Types, Operations.

CO3. Acquire sufficient academic and practical experiences and become self-employed in the nursery ventures.

CO4. Learn about how to prepare suitable soil media for potting up, seedling and cutting.

CO5. Acquire the skills like germinating seed and transplant seedlings and cutting into pots

CO6. Understand the entrepreneurial skills in nursery technology

Unit-I

1. Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4h)

2. Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion - Seed production technology - seed testing and certification. (6h)

3. Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants - green

house - mist chamber, shed root, shade house and glass house. (6h)

Unit-II

4. Gardening: definition, objectives and scope - different types of gardening - landscape and home gardening - parks and its components - plant materials and design - computer applications in landscaping- Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting.(8h)

5. Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study ofcultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6h)

Suggested Readings

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.

2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.

3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.

4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.

5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.

6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET –HYDERABAD.
(AUTONOMOUS) CBCS
DEPARTMENT OF BOTANY
Syllabus-Total Hrs of Teaching 45hrs@ 3hrs/week
B.sc. III YEAR -SEMESTER-VI -PAPER-VII-DSC
(PLANT PHYSIOLOGY)

Course Outcomes:

After completion of the course the students are able to :

CO1. Acquire the knowledge in plant and its water relations.

CO2. Know about the requirement of mineral nutrition for plant growth

CO3. Understand the process of Photosynthesis, Respiration and Nitrogen metabolism

CO4. Know about the Plant Growth hormones (Auxins, Gibberellins. Cytokinins, Ethylene)

UNIT-I (16 Hrs.)

1. WATER RELATIONS:- Importance of water to plant life, physical properties of water, diffusion, imbibition, Osmosis& osmotic pressure ,water potentials; absorption& transport of water, Ascent of sap; transpiration, Stomata structure and movements.

2.MINERAL NUTRITION; Criteria of Essentiality of Elements, Essential macro and micro mineral nutrients and their role; symptoms of mineral Deficiency; absorption of mineral ions; passive and active absorption.

UNIT-II- (16Hrs)

3.ENZYMES:- Nomenclature, IUB classification, mechanism and regulation of enzyme action. Enzyme kinetics factors regulating enzyme action.

4. PHOTOSYNTHESIS:- Photosynthetic pigments, absorption and action spectra; red drop and Emerson Enhancement effect; concept of two photo systems; mechanism of photosynthetic electron transport and evolution of oxygen; photo phosphorylation; carbon assimilation pathways:C3,C4 and CAM Photorespiration.

UNIT-III (12Hrs)

5.TRANSLOCATION OF ORGANIC SUBSTANCES:-Mechanism of phloem transport; source –Sink Relationships

6.RESPRIATION:- Aerobic and Anaerobic; Glycol sis, Krebs' cycle; Electron transport system Mechanism of Oxidative phosphorylation, Pentose phosphate pathway.

UNIT-IV- (16Hrs)

7.NITROGEN METABOLISM:-Biological Nitrogen fixation, Nitrate reduction, Ammonia assimilation. Protein Synthesis, mechanism of protein synthesis.

8.Growth Definition, phases and kinetics of growth Physiological effects of Phyto hormones- Auxins, Gibberellins, Cytokinin, ABA, Ethylene and Brassinosteroids.

B.Sc. III year (Practical) Syllabus and question Bank.
Semester VI –DSC
(Plant Physiology)

I. Conduct Major Physiology experiment(A)

1. Determination of Osmotic potential of vacuolar sap by plasmolytic method using leaves of / Rheo/Tradescantia.
2. Determination of rate of transpiration using cobalt chloride method.
3. Separation of chlorophyll pigments using paper chromatography technique.
4. Estimation of protein by biuret method.

II. Conduct Minor Physiology experiment (B)

5.Determination of stomatal frequency using leaf epidermal peeling impression
6.Determination of catalase activity using potato tubers by titration method.
7.Demonstration of Imbibition.

III. Spotters. (C, D,E,F)-

8. Plasmolysed cell.
9. Stomatal opening and closing.
10.Catalase activity-enzyme concentration.
11.Catalase activity- substrate concentration.
12.Catalase activity- temperature.
13.Chromatogram & Rf.

IV RECORD-

V.Viva Voce

MODEL QUESTION PAPER AND SCHEME FOR VALUATION
SEMESTER -VI
B.Sc. BOTANY – Practical
Practical Paper – VII
Plant Physiology(DSC)

Time: 21/2 hrs Max.Marks- 50

I. Conduct the Major physiology experiment (A) allotted to you . 15M

(Procedure :3, Experiment: 6M, Observation recording of results:3M, Inference:3M)

II. Conduct Minor Physiology experiment (B) 13M

(Procedure: 5M, Experiment:4M, Result & Inference :4M)

III. Spotters. (C, D, E&F) 4x3=12M.

IV.RECORD 5 M

V. Viva Voce 5 M

DEPARTMENT OF BOTANY
Syllabus-Total Hrs of Teaching 45@3hrs/week
B.sc. III YEAR -SEMESTER-VI -PAPER-VIII DSE-III
(TISSUE CULTURE & BIOTECHNOLOGY)

Course Outcomes:

After completion of the course the students are able to:

CO1. Understand the principles and techniques of plant tissue culture

CO 2 . Understand the basic knowledge about tissue culture tools, medium, sterilization and techniques of tissue culture.

CO3. Learn about tissue culture applications

CO4. Understand the fundamentals of Recombinant DNA Technology.

CO5. Know about the Gene libraries, PCR and its applications

CO6. Analyze the enzymes and vectors for genetic manipulations

CO7. Know the concepts, tools and techniques related to in vitro propagation of plants.

TISSUE CULTURE:

UNIT- I

1. Introduction, sterilization procedures, explants culture media-composition and preparation Micropropagation.

(4h).

2. Callus culture; cell and protoplast culture, somatic hybrids and cybrids (8h)

Unit-II

3. Application of tissue culture: production of pathogen free plants and soma clonal variants, production of Stress resistance plants, secondary metabolites and synthetic seeds. (6h)

4. Induction of hairy root and its application in production of secondary metabolites.(2h)

BIOTECHNOLOGY:

Unit- III

1. Introduction, history and scope and applications (3h)

2. DNA Recombinant Technology: Basic aspects of gene cloning. Enzymes used in gene cloning. Restriction enzymes Ligases, polymerases. (8h)

3. Applications of biotechnology in agriculture. (2h)

Unit-IV

1. Gene cloning: Vectors-cloning vehicles, (Cosmids, plasmids, Bacteriophages and Phasmids) applications of r-DNA technology. (8h)

2. Gene Libraries: Genomic Libraries, cDNA libraries. PCR and its applications. (4h)

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GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET-HYDERABAD.
(AUTONOMOUS)CBCS
DEPARTMENT OF BOTANY
B.Sc. III year Practical question bank
Semester VI –DSE-III
(Tissue Culture & Bio-technology)

I. Conduct the Tissue Culture, Biotechnology and Seed technology experiment (A) allotted to you write procedure. Give result and inference

1. Preparation of plant tissue culture medium (basal medium-MS medium)
2. Isolation and estimation of DNA
3. Testing of seed viability using 2, 3, 5 triphenyltetrazolium chloride (TTC)

II. Conduct the tissue culture/ biotechnology/ seed technology experiment (B) allotted to you and write procedure.

4. Demonstration of micro propagation using explants like axillary buds and shoot meristems [inoculation of explants]

5. Demonstration of seed dressing using fungicide to control diseases.
6. Demonstration of seed dressing using biofertilizers (rhizobium) to enrich nutrient supply

III. Critical notes on spotters (specimen / photograph / equipment / sketch without labeling) C D E F and G , (Tissue culture-3; Biotechnology-2)
C D E& F- TISSUE CULTURE & BIOTECHNOLOGY

7. Laminar airflow
8. Incubator
9. Autoclave
10. Culture medium
11. Micropropagation
12.Explantes
13. Callus
14. Somatic embryos
15Antibiotics
16. Vaccines
17. Biofertilizers (Rhizobium)
18. Single Cell protein
19Transgenic plants
20. Multiple shoots
21. Artificial/Synthetic seeds

IV.RECORD
V.Viva Voce

MODEL QUESTION PAPER AND SCHEME FOR VALUATION

SEMESTER - VI
B.Sc. BOTANY – Practical
Practical Paper – VIII: (Tissue Culture, Biotechnology)

Time: 21/2 hrs Max.Marks- 50

1. Conduct the Major experiment (Tissue Culture, Biotechnology and Seed technology) experiment (A) allotted to you .Give procedure, results and inference 15M

(Procedure :3, Experiment : 6M, Observation recording of results :3M, Inference:3M)

II.Conduct the Minor experiment (Tissue Culture, Biotechnology and Seed technology)experiment -13M

(Procedure: 5M, Experiment:4M, Result& Inference-4M)

III. Spotters. (C,D, E&F) 4x3=12M

IV.RECORD- 5 M

V.Viva Voce 5 M

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET-HYDERABAD.
(AUTONOMOUS)CBCS
DEPARTMENT OF BOTANY
B.Sc. II Year Semester-VI
Skill Enhancement Course
SEC-4 (2 hrs/week) (Credits 2) Lectures: 30
Mushroom Culture Technology

Course Outcomes:

After completion of the course the students are able to :

CO1. Acquire adequate knowledge about medicinal importance and types of mushroom.

CO2. Know the nutritional value, cultivation and storage methods.

CO3. Acquire knowledge in mushroom cultivation technology - spawn and spawning techniques.

CO4. Understand the factors influencing the mushroom cultivation and post harvesting methods.

CO5. Acquire sufficient academic and practical experiences and become self-employed.

UNIT-I

1. Introduction & history. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India –Volvariella volvacea, Pleurotus citrinopileatus, Agaricus bisporus. (5h)

2.Cultivation Technology. Infrastructure; substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves.(10h)

3. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production. (2h)

UNIT-II

4. Storage and nutrition : Short-term storage (Refrigeration – upto 24 hours) Long term Storage (canning, pickels, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. (8h)

5.Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad,
Export Value.(5h)

Suggested Readings

1.Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.

2.Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.

3.Tewari, PankajKapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4.Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET-HYDERABAD.
(AUTONOMOUS)CBCS
DEPARTMENT OF BOTANY
B.Sc. III Year Semester-VI
Plant Biodiversity and Human Welfare
GE-2E (2 hrs/week) Credits-2 Generic Elective-II 30 hours

Course Outcomes:

After completion of the course the students are able to:

CO1. Identify the natural resources which can be conserved for future and sustainable development.

CO2. Know the causes of biodiversity loss and about the organization continuously working for biodiversity management and sustainable development.

CO3.Create awareness in conservation of nature and natural resources.

Theory Syllabus

Unit-I:

1. Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-biodiversity and cultivated plant taxa, wild taxa. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes.

2.Loss of Biodiversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro-biodiversity, Projected scenario for biodiversity loss,

3.Conservation of Biodiversity: Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Biodiversity awareness programmes, Sustainable development.

Unit-II:

4.Role of plants in relation to Human Welfare; a) Importance of forestry their utilization and commercial aspects. b) Avenue trees. c) Ornamental plants of India.

d) Alcoholic beverages through ages. Wood and its uses.

5.Fruits and nuts: Important fruit crops their commercial importance.

6.Management of Plant Biodiversity: Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and communication.

Suggested Readings

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices.Oxford and IBH Publications Co. Pvt. Ltd. New Delhi

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD-16

Affiliated To Osmania University, Re-Accredited With 'B^{+}' Grade by NAAC

DEPARTMENT OF BIOTECHNOLOGY

SYLLABUS (2020-2021)

GOVERNMENT COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD – 500016
(AUTONOMOUS)
Composition of Board of Studies - 2018-2021

S.No	Name	
01.	**V.Rohini,** Assistant professor of Biotechnology**.**	Chairman BOS, GDC(w) Begumpet
02.	**Dr. Smitha C. Pawar** Board of Studies in Biotechnology Osmania university	Chairperson BOS, University Nominee, Osmania University
03.	**Dr. Praveen Mamidala** Associate Professor , Head- Department of Biotechnology, Telangana University, Nizamabad	Subject Expert Nominated by Academic Council
04.	**Dr. K. Prem Sagar**, Assistant Professor, Department of **B**iotechnology , Mahatma Gandhi University, Nalgonda	Subject Expert Nominated by Academic Council
05	**Mahesh Kyasani**, Sr Manager, Manufacturing Sciences, Biological E Limited, Shameerpet	Representative from Industry
06	G. Amulya, M.Sc. Biotechnology, University college for women, Koti, Hyderabad	Alumnus

Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities inTelangana
B.Sc - Biotechnology (*wef* 2019)

CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
FIRST YEAR- SEMESTER I				
BS 101	Environmental Science/Basic Computer Skills	AECC-1	2	2
BS 102	English	CC-1A	4	4
BS 103	Second language	CC-2A	4	4
BS 104	**Optional I- Cell biology and Genetics**	**DSC-1A**	**4T+3P=7**	**4+1=5**
BS 105	Optional II	DSC-2A	---------	4+1=5
BS 106	Optional III	DSC-3A	---------	4+1=5
	TOTAL			**25**
FIRST YEAR- SEMESTER II				
BS 201	Gender Sensitization	AECC-2	2	2
BS 202	English	CC-1B	4	4
BS 203	Second language	CC-2B	4	4
BS 204	**Optional I- Biological Chemistry and Microbiology**	**DSC-1B**	**4T+3P=7**	**4+1=5**
BS 205	Optional II	DSC-2B	-----	4+1=5
BS 206	Optional III	DSC-3B	-------	4+1=5
	TOTAL			**25**
SECOND YEAR- SEMESTER III				
BS 301	**SEC 1: Industrial Fermentations**	**SEC-1**	**2**	**2**
BS 302	**SEC 2: Immunological techniques**	**SEC-2**	**2**	**2**
BS 303	English	CC-1C	3	3
BS 304	Second language	CC-2C	3	3
BS 305	**Optional I- Molecular Biology and Recombinant DNA Technology**	**DSC-1C**	**4T+3P=7**	**4+1=5**
BS 306	Optional II	DSC-2C	---------	4+1=5
BS 307	Optional III	DSC-3C	----------	4+1=5
	TOTAL			**25**
SECOND YEAR- SEMESTER IV				
BS 401	**SEC 3: Molecular markers in plant breeding**	**SEC-3**	**2**	**2**
BS 402	**SEC 4: Drug designing**	**SEC-4**	**2**	**2**
BS 403	English	CC-1D	3	3
BS 404	Second language	CC-2D	3	3
BS 405	**Optional I- Bioinformatics and Biostatistics**	**DSC-1D**	**4T+3P=7**	**4+1=5**
BS 406	Optional II	DSC-2D	--------	4+1=5
BS 407	Optional III	DSC-3D	---------	4+1=5
	TOTAL			**25**

THIRD YEAR- SEMESTER V				
CODE	COURSE TITLE	COURSE TYPE	HPW	CREDITS
BS 501	English	CC-1E	3	3
BS 502	Second language	CC-2E	3	3
BS 503	**Basics in Biotechnology**	**GE**	**4**	**4**
BS 504	**Optional I- A/B** **(A) Plant Biotechnology** **or** **(B) Medical Biotechnology**	**DSE -1E**	**4T+3P=7**	**4+1=5**
BS 505	Optional- II **A/B**	DSE -2E	------	4+1=5
BS 506	Optional- III **A/B**	DSE -3E	-------	4+1=5
	TOTAL			**25**
THIRD YEAR- SEMESTER VI				
BS 601	**Project in Biotechnology/** **Optional I: (IPR, Biosafety and Entrepreneurship)**	**Project work/Opt.P**	**4**	**4**
BS 602	English	CC-1F	3	3
BS 603	Second language	CC-2F	3	3
BS 604	**Optional II- A/B** **(A) Animal Biotechnology** **or** **(B) Environmental Biotechnology**	**DSE-1F**	**4T+3P=7**	**4+1=5**
BS 605	Optional- II A/B	DSE -2F	--------	4+1=5
BS 606	Optional- III A/B	DSE -3F	-------	4+1=5
	TOTAL			**25**
	TOTAL Credits			**150**

Total credits= 164-12 (AECC 4 + SEC 8) =15

AECC: **A**bility **E**nhancement **C**ompulsory **C**ourse
SEC: **S**kill **E**nhancement **C**ourse
SEC*:SEC(UGC Recommended courses)
DSC: **D**iscipline **S**pecific **C**ourse
DSE: **D**iscipline **S**pecific **E**lective
GE: **G**eneric **E**lective

Previously recommended SEC 1: Enzyme Technology* and SEC 4: Intellectual Property Rights* have been changed to two UGC recommended SEC courses. SEC 1: **Industrial Fermentation*** and **SEC 4: Drug designing***

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAMME SPECIFIC OUTCOMES of B.Sc Biotechnology

1. Acquire knowledge on the fundamentals of biotechnology for sound and solid base which enables them to understand the emerging and advanced engineering concepts in life sciences.

2. Acquire knowledge in domain of biotechnology enabling their applications in industry and research.

3. Empower the students to acquire technological knowhow by connecting disciplinary and interdisciplinary aspects of biotechnology

4. Recognize the importance of Bioethics, IPR, entrepreneurship, Communication and management skills so as to usher next generation of Indian industrialists

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CREDITS-4 TEACHING HOUR/WEEK-4

SEMESTER-I CELL BIOLOGY AND GENETICS

Course objectives:

- The objective of this course is to have a firm foundation in the fundamentals of Cell Biology, deep understanding of cell biology and advanced knowledge for growth and control microorganisms.
- This course will aid students to acquire skills and competency in cell biology laboratory practices applicable to biological research or clinical methods, including accurately reporting observations and analysis.

B.Sc. Biotechnology I YEAR
SEMESTER- I DSC-Paper- I: CELL BIOLOGY AND GENETICS

Unit 1: Cell structure and Functions

1.1. Cell as basic unit of living organisms-bacterial, fungal, plant and animal cells
1.2. Ultrastructure of prokaryotic cell (cell membrane and plasmids, Nucleoid)
1.3. Ultrastructure of eukaryotic cell (cell wall, cell membrane, nucleus, mitochondria, chloroplast, endoplasmic reticulum, Golgi apparatus, vacuoles)
1.4. Fluid mosaic model, Sandwich model, Cell membrane permeability
1.5. Structure of chromosome-morphology, components of chromosomes (histones and nonhistones),
1.6. Specialized chromosomes (Polytene, Lampbrush) Structural and Numerical Aberrations

Unit 2: Cell cycle

2.1 Bacterial cell division
2.2 Eukaryotic cell cycle –phases
2.3 Mitosis - Stages -significance
2.4 Meiosis- Stages -significance
2.5 Senescence and necrosis
2.6 Apoptosis

Unit 3: Principles and mechanism of inheritance

3.1 Mendelian laws of inheritance- Monohybrid cross, Dihybrid Ratio, Trihybrid Ratio
3.2 Deviation from Mendel's laws- partial or incomplete dominance (eg: Flower Color in *Mirabilis jalapa*), Co-dominance (eg: Coat colour in cattle),
3.3 Gene interaction – Modified dihybrid ratios (12:3:1; 9:7; !5:1; 9:3:4:, 9:7; 13:3),
3.4 Multiple alleleism (eg: Coat color in Rabbits and ABO Blood groups, drosophila eye colour)
3.5 Penetrance and Expressivity (Polydactyly and Waardenburg syndrome, Pleiotropism – microcephaly and cleft lip
3.6 X-Y chromosomes - Sex determination in Drosophila, Birds, Man, Bonellia; X-linked

inheritance– Hemophilia and Color blindness; X-inactivation; Y-linked inheritance-Holandric genes

Unit 4: Linkage, Recombination and Extension to Mendel's Laws

4.1 Linkage and recombination- Stern's Cytological proof of crossing over in Drosophila, Mcclintock-Creighton experiment in maize Phases of linkage, recombination frequency. Gene mapping and map distance

4.2 Non-Mendelian Inheritance – Maternal effect (Shell coiling in snail), variegation in leaves of *Mirabilis jalapa*

4.3 Cytoplasmic Male sterility in Maize

4.4 Chloroplast inheritance in Chlamydomonas,

4.5 Mitochondrial inheritance in human

4.6 Hardy-Weinberg Equilibrium, allelic and genotypic distribution

Course outcomes:

- Students develop an understanding of the Cytoskeleton and Cell Membrane & discuss the structure of Microtubules, microfilaments & can differentiate the organisms by its cell structure

- Students can explain various process in cell division

- To understand the basic unit of the organism.

- To differentiate the organisms by its cell structure.

- To know Components of the Cell and their division.

- To explain the arrangement of Genes and their interaction.

- To describe the influence of environment on gene expression.

- To understand extra nuclear inheritance, linkage & crossing over

SEMESTER-II - Biochemistry and Microbiology

Course Objectives :

- To acquaint students with the concept of bioenergetics and various metabolic processes taking place inside the human body.

- understanding of advantages and hazards of microbial world and advanced knowledge for growth and control microorganisms.
- This course will aid students to acquire skills and competency in microbiological laboratory practices applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.

SEMESTER- II Paper- II: BIOLOGICAL CHEMISTRY AND MICROBIOLOGY

Unit 1: Biomolecules

1.1 Carbohydrates- importance, classification; structure and functions of monosaccharides (glucose & fructose), disaccharides (sucrose, lactose & maltose) and polysachharides (starch, glycogen & inulin)

1.2 Amino acids- importance, classification, structure, physical and chemical properties of amino acids; peptide bond formation

1.3 Proteins- importance, structure of proteins- primary, secondary, tertiary and quaternary

1.4 Lipids- importance, classification- simple lipids (triacylglycerides & waxes), complex lipids (phospholipids & glycolipids), derived lipids (steroids, terpenes & carotenoids)

1.5 Nucleic acids :structure and chemistry of DNA (Watson and crick) and RNA(TMV) Structure and forms of DNA (A, B and Z)

1.6 Enzymes- importance, classification and nomenclature; Michaelis-Menton Equation, factors influencing the enzyme reactions; enzyme inhibition (competitive, uncompetitive & mixed), co-enzymes

Unit 2: Bioenergetics

2.1 Glycolysis, Tricarboxylic Acid (TCA) Cycle,

2.2 Electron Transport, Oxidative Phosphorylation

2.3 Gluconeogenesis and its significance

2.4 Transamination and Oxidative deamination reactions of amino acids

2.5 B-Oxidation of Fatty acids

2.6 Glyoxalate cycle

3. Unit: Fundamentals of Microbiology

3.1 Historical development of microbiology and contributors of microbiology

3.2 Microscopy: Bright field microscopy, Dark field microscopy, Phase contrast microscopy, Fluorescent microscopy, Scanning and Transmission electron microscopy

3.3 Outlines of classification of microorganisms

3.4 Structure and general characteristics of bacteria and virus

3.5 Disease causing pathogens and symptoms (Eg: Mycobacterium, Hepatitis)

3.6 Structure and general characteristics of micro-algae and fungi

4. Unit : Culture and identification of microorganisms

4.1 Methods of sterilization- physical and chemical methods

4.2 Bacterial nutrition nutritional types of bacteria, essential macro& micro nutrients and growth

4.3 Bacterial growth curve-batch and continuous cultures, synchronous cultures measurement of bacterial growth-measurement of cell number and cell mass.
4.4 Factors affecting bacterial growth
4.5 Culturing of anaerobic bacteria and viruses
4.6 Pure cultures and its characteristics

Course outcomes

- After completion of Biochemistry program students will able to get exposed
- To strong theoretical and practical background in fundamental concepts.
- To get insights of multiple important technical areas of Biochemistry.
- To apply contextual knowledge and modern tools of biochemical research for solving problems.
- To give students a generalized idea about microbiology its basic aspects
- Course will provide practical knowledge about different types of bacteria, virus and fungi found in environment
- principles and applications of various types of Microscopy
- Students would know about the contribution of microbiologists, the principle and application of various types of microscopic techniques, and different staining protocols
- Study the morphology of bacteria and detailed account of bacterial cell structure
- Classify microorganisms through Bergey's manual and apply basic knowledge of nutrients required by different microorganisms for their growth
- Students would be able to understand characteristics of viruses, classification and life cycles of viruses
- Description of the structure and Classification, staining, culturing, physiology, of microorganisms

SEMESTER-III - MOLECULAR BIOLOGY & RECOMBINANT DNA TECHNOLOGY

Course Objectives

- To acquaint the students with basic and advanced knowledge of molecular biology.
- Students will be able to understand molecular Biological processes like DNA replication, transcription and repair systems
- Know how different genes are expressed and regulated in a cell by using operon model.
- Understand use the DNA replication mutants in the study of replication

Molecular Biology and Recombinant DNA Technology

Unit 1: Nucleic Acids and Genome organization

1.1 DNA as the genetic material- Griffith's experiments on transformation, Avery McCleod and McCarty experiment, Hershey-Chase experiment, RNA as Genetic Material

1.2 Genome organization in prokaryotes and Eukaryotes

1.3 Genome organization in Mitochondria and Chloroplast genome

1.4 DNA replication- Semi conservative DNA replication-Messelson and Stahl experiment

1.5 Replication in Prokaryotic Genome and Nuclear Genome of Eukaryotes

1.6 Mutation-Spontaneous and Induced , Physical and chemical Mutagens\

2 Gene expression in prokaryotes and Eukaryotes

2.1 Structure of prokaryotic and Eukaryotic gene ,Structure and functions of prokaryotic RNA polymerase

2.2 Transcriptional machinery of eukaryotes - Structure and functions of eukaryotic RNA polymerase

2.3 Genetic Code-Properties ,deciphering genetic code, wobble hypothesis

2.4 Prokaryotic Transcription- initiation, elongation , proof reading and termination (rho dependent and independent),

2.5 Eukaryotic Transcription- initiation, elongation and termination

2.6 Prokaryotic and eukaryotic- Translation- initiation, elongation and termination.

3. Unit: Gene regulation in Prokaryotes and Eukaryotes

3.1 Prokaryotic transcriptional regulation (inducible System)-Operon concept, Lac operon, glucose effect.

3.2 Prokaryotic transcriptional regulation (repressible system)- Tryptophan operon

3.3 Post transcriptional modifications – Capping and Poly adenylation

3.4 Splicing and alternate splicing

3.5 Post translational modification- glycosylation and adenylation and ubiquitination

3.6 Gal regulation in yeast-mating type gene switching

Unit 4: Recombinant DNA Technology

4.1 Enzymes useful in molecular cloning: Restriction endonuclease, DNA ligases, Polynucleotide kinase, DNA Polymerase, klenow enzyme, reverse transcriptase, Alkaline phosphatase, terminal nucleotidyltransferase

4.2 Cloning Vectors: pBR322, Bacteriophage, Cosmid, Phagemid, Shuttle vectors

4.3 Vectors for library preparation (lambda phage vector, Cosmid, BAC and YAC)

4.4 Gene transfer techniques: Physical, Chemical and Biological methods

4.5 Se;lection of recombinant clones-colony hybridization and library screening

4.6 Polymerase Chain Reaction and Applications of recombinant DNA technologies-Agriculture, Medicine

Course Outcomes

- Learning structural levels of nucleic acids- DNA and RNA and genome organization in prokaryotes and eukaryotes.
- Understanding the concept of Gene and the gene architecture.
- Overview of the central dogma of life and various molecular events
- Overview of the central dogma of life and various molecular events
- Understanding the principles and applications of Polymerase Chain Reaction(PCR).
- Molecular Events of Transcription and processing of transcripts, RNA editing.
- Described the knowledge of recombinant DNA technology
- Understood the tools of gene manipulation and gene transfer
- Knowledge of construction and labeling of molecular probe, construction of genomic library and protein engineering.
- Understood the techniques of recombinant DNA technology and its applications
- Came to know about the techniques and applications of human genome projects
- Molecular Events of Translation leading to protein synthesis and Post translational modification.
- Understanding the regulation of gene expression in prokaryotes using operon concept and Eukaryotes.
- Learn the methods of DNA sequencing and various tools and techniques of molecular biology.

SEMESTER IV- Bioinformatics and Biostatistics

Course objectives

- knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics
- existing software effectively to extract information from large databases and to use this information in computer modeling
- problem-solving skills, including the ability to develop new algorithms and analysis methods
- an understanding of the intersection of life and information sciences, the core of shared concepts, language and skills the ability to speak the language of structure-function relationships, information theory, gene expression, and database queries

Bioinformatics and Biostatistics

Unit 1: Introduction to Bioinformatics and Biological Databases

1.1 Bioinformatics – a history, Scope and applications

1.2 Bioinformatics tools and resources, internet basics, role of internet, free online tools, downloadable tools

1.3 Bioinformatics web portals-NCBI, EBI,ExPASy

1.4 Biological databases: classification of Databases primary (Genbank), Secondary (PIR),Tertiary and composite (KEGG)databases

1.5 Sequence Databases – DNA sequence databases

1.6 Protein data sequence databases-(swissprot and PROSITE)

Unit 2: Sequence Alignment

2.1 Basics of sequence alignment – match, mismatch , gaps, gap penalties, Scoring alignment

2.2 Types of sequence alignment- pairwise and multiple alignment, local and Global alignment

2.3 Dot matrix comparison of sequences

2.4 Scoring matrices – PAM and BLOSUM

2.5 Pair wise sequence similarity search by BLAST and FASTA

2.6 Concepts of phylogeny- distance based (NJ Method) and Character based (ML method) ,Tree construction methods

Unit 3: Descriptive Biostatistics and Probability

3.1 Introduction to Biostatistics, kinds of data and variables, based on nature (numerical, discrete and continuous, categorical –ordinal and nominal), based on source (primary and secondary data) sample size, sampling methods and sampling errors

3.2 Data tabulation and representation methods, graphical methods (stem and leaf plot, line diagram, bar graphs, histogram, frequency polygon & frequency curve)diagrammatic method(pie diagram)

3.3 Measures of central tendency- arithmetic mean, median, mode (merits and demerits)

3.4 Measures of dispersion- range, mean deviation, variance and standard deviation, Standard error and Co efficient of Variation -merits and demerits

3.5 Concepts of probability-random experiment, events and Probability of an event, probability rules (addition and multiplication), uses of permutation and combinations, random variables(discrete and continuous)

3.6 Probability distributions-Binomial, Poisson for discrete variables and Normal distribution for continuous varialbles

Unit 4: Applications of Biostatistics

4.1 Hypothesis testing- steps in testing for statistical hypothesis, null and alternative hypothesis level of significance- type 1 and type 2 errors

4.2 Test of significance- for small samples- student's t- test(one sample amd two samples)

4.3 Test of significance- for large samples – Z test for means and proportions

4.4 Chi-square test- and their applications –goodness of fit, test of independence

4.5 Analysis of Varience (ANOVA)- one way analysis

Course Outcomes

- Bioinformatics is the science of storing, extracting, organizing, analyzing, interpreting and using information.
- The approaches to the discipline of bioinformatics incorporate expertise from the biological sciences, computer science and mathematics.
- The major in bioinformatics is designed for students interested in molecular biology and genetics, information technologies and computer science.

- Bioinformaticists are involved in the analysis of the human genome, identification of targets for drug discovery, development of new algorithms and analysis methods, the study of structural and functional relationships, and molecular evolution.
- Store and Retrieve drug related information using online tools
- Comprehend the utility of tools & databases available in genomic & proteomics
- Understand simple calculations
- Statistics helps to analyze data, interpret, and present information
- Publishing research data
- Calculate; analyse and compare observed data; perform simple sums in proportions and algebraic functions

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD.
AUTONOMOUS (CBCS)
B.Sc BIOTECHNOLOGY III YEAR (2020-21)
SEMESTER V CORE THEORY- V
MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY

COURSE OUTCOMES **CREDITS-4 TEACHING HOUR/WEEK-4**

After completion of the course student will understand:

- Structural levels of nucleic acids- DNA and RNA and genome organization in prokaryotes and eukaryotes.
- The concept of Gene and the gene architecture.
- Molecular Events of Transcription and processing of transcripts
- The knowledge of recombinant DNA technology

Unit 1: Gene expression in prokaryotes

1.1 Structure of prokaryotic gene (promoter, initiator & terminator regions), Structure and functions of RNA polymerase
1.2 Transcription and Translation mechanism- initiation, elongation & proof reading.
1.3 Genetic code, wobble hypothesis
1.4. Gene regulation and Operon concept.

Unit 2: Gene expression in eukaryotes

2.1 Structure of eukaryotic gene (promoter, exons, introns, terminator, enhancer & silencer)
2.2 Transcription- initiation, elongation and termination
2.3 Translation- initiation, elongation and termination
2.4Post-transcriptional modifications- capping, polyadenylation, Splicing (self &protein mediated) and alternative splicing, Post Translational modification.

Unit 3: Recombinant DNA Technology

3.1 Enzymes useful in molecular cloning: Restriction endonuclease, DNA ligases, Polynucleotide kinase,
3.2 DNA Polymerase- I, klenow enzyme, reverse transcriptase,
3.3 Alkaline phosphatase, terminal nucleotidyltransferase
3.2 Cloning Vectors: pBR322, pUC19, Expression Vectors
3.4 Bacteriophage, Cosmids, Phagemid, Shuttle vectors

Unit 4: Applications Recombinant DNA Technology

4.1 Gene transfer techniques: Physical, Chemical and Biological methods
4.2 Blotting techniques (Southern, Northern, Western, Zooblot)
4.3 Polymerase Chain Reaction and its applications, DNA sequencing and DNA fingerprinting & its applications
4.4 Applications of recombinant DNA technologies- Agriculture, Medicine.

CORE-V PRACTICALS
MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY

1. Isolation of DNA from bacterial cells
2. Isolation of plasmid DNA
3. Agarose gel electrophoresis of DNA
4. Quantification of DNA by Spectrophotometer
5. Separation of proteins by SDS-PAGE
6. Polymerase Chain Reaction
7. Restriction digestion of DNA
8. Bacterial Transformation (Selection of transformants with blue white selection)

REFERENCE BOOKS

1. Molecular Biology of the cell. Alberts, B; Bray, D, Lews, J., Raff, M., Roberts, K and Watson, J.D. Garland publishers, Oxford
2. Molecular Biology of the Gene - By Watson, Hopkins, Goberts, Steitz and Weiner (Pearson Education)
3. Text Book of Biotechnology - By H.K. Das (Wiley Publications)
4. Gene Structure & Expression - By J.D. Howkins, Publ: Cambridge
5. Test Book of Molecular Biology - By K.S. Sastry, G. Padmanabhan& C. Subramanyan, Publ: Macmillan India
6. Principles of Gene Manipulation - By R.W. Old & S.B. Primrose, Publ: Blackwell
7. Genes - By B. Lewin - Oxford Univ. Press
8. Molecular Biology &Biotechnol. - By H.D. Kumar, Publ: Vikas
9. Methods for General & Molecular Bacteriology - By P. Gerhardf et al., Publ: ASM
10. Molecular Biotechnology - By G.R. Click and J.J. Pasternak, Publ: Panima
11. Genes and Genomes – By Maxine Singer and Paul Berg
12. Molecular Biology - By D. Freifelder, Publ: Narosa
13. Molecular biology. By;F.Weaver. WCB/McGraw Hill.
14. Gene, Genomics and Genetic Engineering - By Irfan Ali Khan and AtiyaKhanum (Ukaaz Publications).

SEMESTER V Plant Biotechnology

Course objectives:

- To make students aware of various tissue culture techniques and their application in biotechnology for commercial purpose and to acquaint students with applications of genetic engineering like transgenic plants

- The course will provide complete exposure as how plant and animal cells are isolated, cultured and genetically manipulated in laboratory. Also the course will provide information how cell suspension cultures can be utilized for molecular farming for commercially synthesizing products such as vaccines, hormones, proteins, enzymes, etc

SEMESTER V PLANT BIOTECHNOLOGY

Unit 1: Basics of Plant Biotechnology

1.1 Introduction to plant tissue culture, totipotency of plant cells (Dedifferentiation, redifferentiation, regeneration of whole plant) Initiation of callus cultures
1.2 Nutritional requirements for plant tissue culture: Plant growth regulators (cytokinins, auxins, gibberellins).
1.3 Preparation of media, selection and surface sterilization of explants, inoculation, incubation (temperature and light regime), regeneration of plants.
1.4 Regeneration of Plants (Organogenesis & Embryogenesis)

Unit 2: Methods in Plant Tissue Culture

2.1 Meristem culture and production of disease free plants
2.2 Micropropagation: Factors affecting and applications
2.3Cell suspension culture- Batch and Continous Culture for production of secondary metabolites.
2.4 Virus resistant plants: Transgenic plants with viral coat protein and viral nucleoprotein

Unit 3: Applications of Plant Tissue Culture

3.1 Encapsulation and production of synthetics seeds
3.2 ; Protoplast culture and fusion, Development of somatic hybrids
3.3, production of haploids, Anther and pollen culture
3.4 Methods of cryopreservation for conservation of plant germplasm

Unit 4: Transgenic plants and applications

4.1 Gene Transfer techniques for production of transgenic Plants
4.2 Engineering Biotic and Abiotic Resistance in plants: Bt cotton, Stress tolerant, Heat Tolerance, Fungal resistance in plants
4.3 Transgenic plants with enhanced nutritive values: Vitamin A, Vitamin E
4.4 Transgenic plants as Bioreactor: Antibody production in plants, Biodegradable plastics

Course outcomes

- Learning important milestones in the plant tissue culture.
- Understanding the concepts and principles of Plant tissue culture.
- Learning the techniques of sterilization and monitoring method of sterilization.
- Learning different pathways of plant regeneration under in vitro conditions - organogenesis and somatic embryogenesis.

- Techniques of establishing cell suspension culture. Synthetic seeds and applications.
- Understanding the techniques of virus elimination – methods of virus indexing. Meristem and Shoot tip culture and Applications.
- Performing procedures for Micropropagation techniques in rose and banana.
- Culturing of reproductive structures - anther, microspores, embryos, endosperm, Ovule and ovary cultures and methods to produce haploids.
- Protoplast isolation, culture and protoplast fusion - applications -. Somaclonal variation - applications.
- Learning methods to conserve germplasm under In vitro. Production of Secondary metabolites production through cell culture.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD.
AUTONOMOUS (CBCS)
B.Sc BIOTECHNOLOGY III YEAR (2020-21)
SEMESTER-VI CORE THEORY VI
MICROBIAL TECHNOLOGY

COURSE OUTCOMES **CREDITS-4 TEACHING HOUR/WEEK-4**

After completion of the course student will understand:

- Useful microorganism used industry.
- Culturing the microorganisms used industry.
- Will be able to explain the production of industrial products from microorganisms with fermentation.
- Will be able to list the fermentation media.

Unit 1: Introduction to Microbial technology
1.1. Exploitation of microorganisms and their products
1.2. Isolation and screening of microorganisms for industrial products
1.3. Strategies for Strain improvement (mutation, selection, recombination)
1.4. Preservation of industrial microorganisms

Unit 2: Microbial fermentation
2.1 Principles of Fermentation technology
2.2 Fermentation concept and design
2.3 Types of fermentation
2.4 Formulation and design of fermentation media

Unit 3: Methods of Microbial fermentation

3.1 Factors affecting fermentation process
3.2 Substrates used as Carbon and Nitrogen Inoculum development
3.3 Microbial production of Organic acids (Lactic acid, citric acid), Aminoacids (Glutamic acid, Aspartic acid)
3.4 Fermentation by microbes for food additives: dairy products (Cheese, Yogurt)

Unit4: Microbial technology products and applications

4.1 Therapeutic drugs: Recombinant vaccines – (Hepatitis B, insulin and Monoclonal antibodies)
4.2 Biofuel:Hydrogen, Alcohol, Methane
4.3 Biomining (Extraction of Copper, Uranium)
4.4 Bioremediation (Soil and Ground water)

CORE-VI PRACTICAL
MICROBIAL TECHNOLOGY

1. Screening of Microorganisms (Primary selection, secondary selection)
2. Production of Citric acid
3. Screening of amylase producing microorganisms
4. Production of wine using common yeast
5. Production of alcohol by fermentation and Estimation of alcohol by colorimetry
6. Production of antibiotic
7. Production of biofertilizers (Azolla)
8. Isolation of microbes from soil or industrial effluents
9. Quality testing of milk by MBRT

REFERENCE BOOKS

1. Text Book of Biotechnology - By H.K. Das (Wiley Publications)
2. Biotechnology -By H.J. Rehm and G. Reed. VIH Publications, Germany
3. Biogas Technology - By b.T. Nijaguna
4. Biotechnology - By K. Trehan
5. Industrial Microbiology - By L.E. Casida
6. Food Microbiology - By M.R. Adams and M.O. Moss
7. Introduction to Biotechnology - By P.K. Gupta
8. Essentials of Biotechnology for Students - By Satya N. Das
9. Bioethics – Readings and Cases - By B.A. Brody and H. T. Engelhardt. Jr. (Pearson Education)
10. Biotechnology, IPRs and Biodiversity - By M.B. Rao and Manjula Guru (Pearson Education)
11. Bioprocess Engineering - By Shuler (Pearson Education)
12. Essentials of Biotechnology - By Irfan Ali Khan and AtiyaKhanum (Ukaaz Publications)

SEMESTER VI - Animal Biotechnology

Course objectives :

- The application of biotechnology to animals will be learned in detail.
- Challenges facing the intensive and extensive livestock industries, as well as wildlife management and conservation, will be discussed
- Problems specific farm animals will be also considered.
- The contribution of biotechnology to laboratory animal models for human and animal disease will be addressed.
- In addition, the use of biotechnology for animal related issues such as food safety, disease control and biosecurity will be considered.
- Different reproductive technologies will be introduced
- The integration of these technologies to improve animal production, health and welfare will be explored.

Unit 1: **Animal tissue culture: principles and applications**
1.1 Cell culture technique: cell culture media, sterilization techniques
1.2 Cell lines, characteristic feature of cell lines and maintenance
1.3 Methods of separation of various cell types (physical and enzymatic methods)
1.4 Stem cell: Features, culture, embryonic stem cells and adult stem culture

Unit 2: **Animal improvement for desired traits by biotechnology interventions**
2.1 Scope for biotechnological interventions (Buffalo as multipurpose livestock)
2.2 Model organisms and their significance (Cattle, Fish)
2.3 DNA micromanipulation
2.4 Somatic cell nuclear transfer, Embryo sexing

Unit 3: **Developments in Molecular markers in Livestock and Transgenic Animals**
3.1 Gene mapping and identification of genes of economic importance in farm animals
3.2 Developments in Livestock Genomics (Estimated Breeding Value -EBV)
3.3 Molecular markers (RFLP, RAPD and SNP) and applications
3.4 Applications of cell culture: Cell based manufacturing (vaccines), toxicity testing and tissue engineering

Unit 4: **Applications in Animal Biotechnology**
4.1 Animal transgenesis- methods and applications
4.2 Animal cloning – Case study-Dolly
4.3 Applications of animal biotechnology: Gene therapy, milk production, meat production, Aquaculture production
4.4 Ethical consideration of Transgenic animals

Course outcomes

- Outline the history and structure of animal cell

- To illustrate the techniques, procedure and growth patterns of animal cell culture.
- To describe in vitro applications of animal cell culture
- To distinguish the structure of gametes and its application in animal cell culture.
- To use the assisted reproductive technology practised in livestock and its applications
- To construct the techniques in production of cloned animal and its applications.
- To predict the ethical, social and moral issues related to cloning
- To Construct techniques involved in transgenic animal technology and its applications
- To apply the applications of Gene therapy for the treatment of various diseases.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)

BEGUMPET, HYDERABAD

Affiliated to Osmania University

Bachelor of Business Administration(BBA)

COURSE STRUCTURE, SYLLABUS, POs, PSOs & COs

CHOICE BASED CREDIT SYSTEM 2020-21

BBA-PROGRAMME OUTCOMES

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAMME SPECIFIC OUTCOMES

PSO1	Ability to define analyse the solutions for different business problems And using logical reasoning patterns for evaluating information, materials and data for practical implementation
PSO2	Provides verbal ,reasoning ,data interpretation, Quantitative and communication skill to solve specific business problems and decision making
PSO3	Apply ethical principles and commitment towards professional ethics and responsibility
PSO4	Function effectively as a member ,leader, individual or group in diverse environment
PSO5	Ability to conceptualise a complex issue into a coherent written statement and oral presentation and to communicate effectively on complex activities with technical community.
PSO6	Providing an opportunity for the students to gain practical exposure towards the workplace and make them industry ready.
PSO7	Promotes entrepreneurship by providing understanding of the fundamentals of creating and managing innovation ,new business development and high growth potential entities.
PSO8	Ability to demonstrate technical competence in domestic and global arena of business through the study of major disciplines within the fields of business.

FIRST YEAR

SEMESTER-I

Course Code	*Course Title*	Course Type	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB101	**Environmental Science**	**AECC-1**	**2**	**2**		
BB102	**English**	**ELS-1A**	**4**	**4**		
BB103	**Second Language**	**SLS-1A**	**4**	**4**		
BB104	**Principles of Management**	**DSC-1A**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB105	**Basics of Marketing**	**DSC-2A**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB106	**Business Economics**	**DSC-3A**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

SEMESTER – II

Course Code	*Course Title*	Course Type	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB201	Basic Computer Skills	**AECC-2**	**2**	**2**		
BB202	**English**	**ELS-1B**	**4**	**4**		
BB203	**Second Language**	**SLS-1B**	**4**	**4**		
BB204	Organizational Behavior	**DSC-1B**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB205	Business Statistics	**DSC-2B**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB206	Financial Accounting	**DSC-3B**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

HPW- Hours per Week ; AEC-Ability Enhancement Course(Compulsory)

ELS-English Language Skill ; SLS Second Language Skill;
DSC – Discipline Specific Course (E) – External Assessment (I) – Internal Assessment

SECOND YEAR

SEMESTER-III

Course Code	*Course Title*	**Course Type**	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB301(a)	Personality Development-I	**SEC-1**	**2**	**2**	1 ½ Hrs.	40 E +10 I
BB301(b)	Basic Quality Management	**SEC-2**	**2**	**2**	1 ½ Hrs.	40 E + 10 I
BB302	English	**ELS-1C**	**3**	**3**		
BB303	Second Language	**SLS-1C**	**3**	**3**		
BB304	Human Resource Management	**DSC-1C**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB305	Information Technology for Business	**DSC-2C**	**4T+ 1P**	**5**	**2 ½ Hrs.**	**60 E + 20I+ 20 P**
BB306	Financial Management	**DSC-3C**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

SEMESTER – IV

Course Code	*Course Title*	**Course Type**	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB401(a)	Personality Development - II	**SEC-3**	**2**	**2**	1 ½ Hrs	40 E + 10 I
BB401(b)	Start Up Management	**SEC-4**	**2**	**2**	1 ½ Hrs	40 E + 10 I
BB402	English	**ELS-1D**	**4**	**4**		
BB403	Second Language	**SLS-1D**	**4**	**4**		
BB404	Financial Accounting	**DSC-1D**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB405	Market Research	**DSC-2D**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB406	Management Science	**DSC-3D**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

HPW- Hours per Week ; AEC-Ability Enhancement Course(Compulsory)
ELS-English Language Skill ; SLS Second Language Skill;
DSC – Discipline Specific Course (E) – External Assessment (I) – Internal Assessment

THIRD YEAR
SEMESTER-V

Course Code	*Course Title*	Course Type	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB501	Mobile Commerce	**GE-1**	**4**	**4**	1 ½ Hrs.	40 E +10 I
BB502	English	**ELS-1C**	**3**	**3**		
BB503	Second Language	**SLS-1C**	**3**	**3**		
BB504	Brand Management	**DSC-1E**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB505	Retail Management	**DSC-2E**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB506	Customer Relationship Management	**DSC-3E**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

SEMESTER – VI

Course Code	*Course Title*	Course Type	*HPW*	*Credits*	*Exam Hrs.*	*Marks*
BB601	Business Analytics	**GE-2**	**4**	**4**	1 ½ Hrs	40 E + 10 I
BB602	English	**ELS-1D**	**4**	**4**		
BB603	Second Language	**SLS-1D**	**4**	**4**		
BB604	Buyer Behavior	**DSC-1F**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB605	Advertising and Sales Promotion	**DSC-2F**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
BB606	Rural Marketing	**DSC-3F**	**5**	**5**	**2 ½ Hrs.**	**60 E + 40 I**
	Total Semester Credits		**25**	**25**		

HPW- Hours per Week ; AEC-Ability Enhancement Course(Compulsory)
ELS-English Language Skill ; SLS Second Language Skill;
DSC – Discipline Specific Course (E) – External Assessment (I) – Internal Assessment

SEMESTER-I

BBA SEM-1 (CBCS) SYLLABUS 2021-22

PAPER CODE: BB104 PRINCIPLES OF MANAGEMENT

Course Objective

The general objective of this course is to provide a broad and integrative introduction to the the theories and practice of management. In particular, the course focuses on the basic areas of the management process and functions from an organizational viewpoint. The course also attempts to enable students to understand the role, challenges, and opportunities of management in contributing to the successful operations and performance of organizations.

Course Outcomes

CO-1: To make student understand the meaning, principles and evolution of management and further to enhance their knowledge in its functions.

CO-2: To present the importance of Planning and Decision Making.

CO-3: To acquaint student the concepts of Organizing, Span of Management, Patterns of organization and Common organizational structures.

CO-4: To present the sources of recruitment and Training.

CO-5 : To present the emerging issues in management.

SYLLABUS

UNIT - I : INTRODUCTION TO MANAGEMENT :

Meaning, definition, concept, scope and principles of management; Evolution of management thought - Management theories- classical, behaviour, system, contingency and contemporary perspectives on management. Management art or science and management as profession. Process and levels of Management. Introduction to Functions (POSDCORB) of Management.

UNIT - II : PLANNING – IMPORTANCE :

Planning – Importance, objectives, process, policies and procedures, types of planning, Decision making - Process of decision making, Types of decision, Problems involved in decision making.

UNIT - III : ORGANIZING :

Meaning, importance, principles of organizing, span of management, Patterns of organization – formal and informal organizations, Common organizational structures; departmentalization, Authority-delegation, centralization and decentralization, Responsibility – line and staff relationship;

UNIT - IV : STAFFING :

Sources of recruitment, Selection process, Training, Directing, Controlling – Meaning and importance, Function, span of control, Process and types of Control, Motivation, Co- ordination – Need and types and techniques of co-ordination - Distinction between coordination and co-operation - Requisites for excellent co-ordination - Systems Approaches and co-ordination.

UNIT - V : EMERGING ISSUES IN MANAGEMENT :

Total Quality management, Technology Management, Talent and Knowledge Management, Leadership, Organizational change and Development, Corporate Social responsibility

SUGGESTED BOOKS :

1. Robbins, S. P., & DeCenzo, A. D. Fundamentals of Management. New Delhi: Pearson Education.
2. Harold Koontz & Heinj Weihrich, (2018) Essentials of Management, 10th Edition, Tata McGraw-Hill Education,
3. T.Ramasamy (2018) Principles of Management, Himalaya Publishing House, Mumbai.
4. L.M. Prasad, Principle and Practice of Management, Sultan Chand and Sons, 6thedition.
5. Gupta, Sharma and Bhalla; Principles of Business Management; Kalyani Publications; 1st ed.
6. P.C. Tripathi & P.N. Reddy, (2015) Principles of Management, 5th Edition, Tata McGraw-Hill Education, New Delhi.

BBA SEM-1 (CBCS) SYLLABUS 2021-22

PAPER CODE: BB105 BASICS OF MARKETING

Course Objective

To provide an exposure to the students pertaining to the nature and Scope of marketing, which they are expected to possess when they enter the industry as practitioners. To give them an understanding of the basic philosophies and tools of marketing management.

Course Outcomes

CO-1: To understand the concept of Marketing and Selling.
CO-2: To understand the concept of Market Segmentation and its importance in marketing.
CO-3: To present process of new product development.
CO-4: To present the techniques New Product Development and Pricing decisions during the life of a product.
CO-5: To understand the importance and effectiveness of Promotional Mix.

SYLLABUS

UNIT - I : INTRODUCTION OF MARKETING :

Nature, Scope and Importance of Marketing, Evolution of Marketing; Core marketing concepts; Production concept, Product concept, Selling concept, Marketing concept. Marketing Environment: Micro and Macro Environment

UNIT - II : MARKET SEGMENTATION :

Target Market and Product Positioning: Levels of Market Segmentation, Bases for Segmenting Consumer Markets, Bases for Segmenting Industrial Markets. Target Market and Product Positioning Tools.

UNIT - III : NEW PRODUCT DEVELOPMENT :

Introduction, Meaning of a New Product. Need and Limitations for Development of a New Product, Reasons for Failure of a New Product, Stages in New Product Development and Consumer Adoptions Process.

UNIT - IV : PRODUCT & PRICING DECISIONS :

Concept of Product, Product Life Cycle (PLC), PLC marketing strategies, Product Classification, Product Line Decision, Product Mix Decision, Pricing Decisions: Concept of Price, PricingMethods and Pricing Strategies

UNIT - V : PROMOTION MIX :

Concept of Promotion Mix, Factors determining promotion mix, Promotional Tools – Types of Advertisement, Sales Promotion, Public Relations & Publicity and Personal Selling; Distribution: Designing Marketing Channels Channel functions, Types of Intermediaries.

SUGGESTED BOOKS :

1. Kotler Philip, Garyarmstrong, Prafullay. Agnihotri, EU Haque, "Principles of Marketing",2018, 18th Ed, Pearson Education Prentice Hall of Indi..
2. Paul Baines, Chris Fill, Kelly page, "Marketing Management", 2018, 15 Ed., OxfordUniversity Press.
3. Kotler, P., Armstrong, G., Agnihotri, P. Y., & Ul Haq, E.: Principles of Marketing: A SouthAsian
4. Dr. Sreeramulu, "Basics of Marketing, (2019), HPH
5. Ramaswamy, V.S. & Namakumari, S.: Marketing Management: Global Perspective-Indian,2019
6. Context, Macmillan Publishers India Limited.4. Rajan Saxena, "Marketing Management",2009, 4th Ed. Tata McGraw H

BBA SEM-1 (CBCS) SYLLABUS 2021-22

PAPER CODE: BB106 BUSINESS ECONOMICS

COURSE OBJECTIVE:

The Purpose of this course is to apply micro economic concepts and tools for analyzing business problems and making accurate decision pertaining to the business firms. The emphasis is given to tools and techniques of micro economics

Course Outcomes

CO-1: To understand nature and scope of Business Economics.

CO-2: To comprehend the Demand Concepts and Elasticity of Demand.
CO-3: To apprehend theory of production and cost concepts.
CO-4: To learn short and long run cost curves and economies and diseconomies of scale.
CO-5: To grasp the concept of market and its structures.

SYLLABUS:

UNIT - I : BUSINESS ECONOMICS NATURE AND SCOPE :

Introduction to business economics, characteristics, nature and scope concept of opportunities Cost, Incremental cost. Time perspective, Discounting and equi-marginal principle

UNIT – II : DEMAND CONCEPTS & ELASTICITY OF DEMAND :

Concept of Demand Determinates of demand , law of demand, exception to the law of demand, elasticity of demand, types of demand elasticity, uses of demand elasticity. Concept of Supply, Determinants of Supply, Law of Supply, Elasticity of Supply.

UNIT – III : PRODUCTION AND COST CONCEPTS :

Theory of production, production function, input output combination, short run production laws, law of diminishing marginal returns to scale, ISO-quant curves, ISO-cost curves

UNIT – IV : BUDGET LINE :

Cost concepts, cost classification, short run cost curves and long run cost curves, Experience curve. Economies and diseconomies to the scale, economies of scope.

UNIT – V : MARKET STRUCTURES AND PRICING :

Concept of market, structures, perfect competition market and price determination, monopoly andabnormal profits, monopolistic completion market price determination, price discrimination. Oligopoly, features of oligopoly, syndicating in oligopoly, kinked demand curve, price leadership and market positioning.

SUGGESTED BOOKS :

1. Dominik Salvotore, (2015) Principal of Micro Economics (7th Edn) oxford UniversityPress.
2. Dr. D N Mithani, (2018) Managerial Economics Theory and Appliocation, HPH
3. Varshiney & Maheswari, Managerial Economics, Juptan Publication, New Delhi
4. Lipsey and Crystal (2008) Economics International (15th Edn) Oxford University Press..
5. Kutosynnis (1979) Modern Mircro Economics (5th Edn) Mc millan Publishers

II - SEMESTER

BBA SEM-II (CBCS) SYLLABUS 2021-22

PAPER CODE: BB204 ORGANIZATIONAL BEHAVIOUR

COURSE OBJECTIVE:

The main objective is to explain the fundamentals of managing business and to understand individual and group behavior at work place so as to improve the effectiveness of an organization.

Course Outcomes

CO-1: To understand nature, factors influencing and scope of Organizational development.
CO-2: To comprehend the concept, importance and theories of motivation and Leadership.
CO-3: To apprehend of groups and group dynamics.
CO-4: To understand the concept of management of Change.
CO-5: To grasp the concept of Organizational Culture, Conflict and Effectiveness.

SYLLABUS:

UNIT - I : ORGANIZATIONAL BEHAVIOR :

Meaning, importance and historical development of organizational behavior, Factors influencing organizational behavior. Perception and Attribution- concept, nature and process, Factors influencing perception. Values and Attitudes. Personality - Stages of personality development, Determinants of personality. Concept and theories of learning.

UNIT – II : MOTIVATION :

Concept, importance and theories of motivation. Leadership - concept, characteristics, theories and styles of leadership, Managerial grid, Leadership continuum and Leadership effectiveness.

UNIT - III : GROUP DYNAMICS :

Meaning of groups and group dynamics, Formation, Characteristics and Types of groups, Theories of group dynamics, Group cohesiveness - Factors influencing group cohesiveness - Group decision making process. Types of teams. Analysis of Interpersonal Relationship: Transactional Analysis, Johari Window.

UNIT – IV : MANAGEMENT OF CHANGE :

Meaning and importance of change, Factors contributing to organizational change, Change agents, Resistance to change – causes of and dealing with resistance to change, Organizational Development - meaning and process.

UNIT - V : ORGANIZATIONAL CULTURE, CONFLICT AND EFFECTIVENESS :

Concept of Organizational Culture, Distinction between organizational culture and organizational climate, Factors influencing organizational culture, Morale- concept and types of morale. Managing conflict, Organizational Effectiveness - Indicators of organizational effectiveness, Achieving organizational effectiveness. Organizational Power and Politics**.**

SUGGESTED BOOKS :

1. Robbins, P.Stephen - Organizational Behavior-concepts, controversies & Applications - Prentice Hall of India Ltd.,
2. Luthans Fred - Organizational Behavior - McGraw Hill Publishers Co. Ltd., New Delhi,1988.
3. Rao, VSP and Narayana, P.S. - Organization Theory & Behavior - Konark Publishers Pvt.Ltd., Delhi, 1987.
4. Prasad, L.M - Organizational Theory & Behavior - Sultan Chand & Sons, New Delhi, 1988.
5. Sekaran, Uma - Organizational Behavior-text & cases - Tata McGraw Hill Pub Ltd., New Delhi, 1989.
6. Aswathappa. K. - Organizational Behavior – Himalaya Publishing House, Mumbai, 18th Edition, 2018.
7. Afsaneh Nahavandi - Organizational Behavior – Sage Publications.
8. P Subba Rao – Organizational Behavior (2018), HPH, 18th Edition

BBA SEM-II (CBCS) SYLLABUS 2021-22

PAPER CODE: BB205 BUSINESS STATISTICS

COURSE OBJECTIVE:

The Objective of this course to provide a student an understanding of basic statistical tools to apply for management problems and analysis. The tools starting from data gathering , tabulation, presentation and analyzing using basic statistical techniques like measures of central tendency, dispersion, kurtosis, correlation and regression.

Course Outcomes

CO-1: To understand the importance of Statistics in Business decisions and classification of data.
CO-2: To introduce the measures of central tendency.
CO_-3: To understand the significance and requisites of measuring dispersions, Skewness and kurtosis.
CO-4: To help the students in understanding the importance of Index Numbers in business decisions.
CO-5: To understand the concept of Correlation and Regression in business decisions.

SYLLABUS:

UNIT – I : STATISTICS :

Definitions – Statistical methods – Importance and Scope – Limitations – Need for Data – Principals of Measurement. Tabulation and Presentation:

Classification of Data – Data Array – Frequency Distribution – Methods of data Classification – Types of Frequency Distributions / tabulation of Data – Objectives of Tabulation – Parts and Types of Tables – Graphical Presentation – Functions of Graphs – Advantages and limitations of Graphs.

UNIT – II : MEASURES OF CENTRAL TENDENCY :

Introduction to Averages – Requisites for a Measure of Central Tendency, Mean - Combined mean – Weighted mean, Median – Partition values – Quartiles, Deciles and Percentiles, Relationship between Partition values–Mode– Relationship between Mean, Median andMode.

Measures of Dispersion:

Introduction – Significance and Requisites of a Measure of dispersion, Range, QD, MD and SD- For Grouped and Ungrouped – Advantages and Disadvantages. Concept of Variation – Coefficient of Variation.

Skewness and Kurtosis (SK):

Introduction, Measures of SK, Relative measures of SK – Advantages and Disadvantages. Moments – concepts –Calculation – Kurtosis.

UNIT – III : INDEX NUMBERS :

Index Numbers - Introduction – Types – Characteristics – Construction weighted and unweighted index numbers – Price and Quantity/Volume index numbers – Tests – time reversal – Factor Reversal and Circular tests – Chain and Fixed base – Changing of base – Combining of two of more overlapping indices consumer

price Index – Problems in Construction.

UNIT – V : CORRELATION AND REGRESSION ANALYSIS :

Correlation Analysis: Scatter diagram, Positive and negative correlation, limits for coefficient of correlation, Karl Pearson's coefficient of correlation, Spearman's Rank correlation.

Regression Analysis: Concept, least square fit of a linear regression, two lines of regression, properties of regression coefficients(Simple problems only)

SUGGESTED BOOKS :

1. Gupta SC: "Fundamental of Statistics" 7th Ed, Himalaya Publishers House, 2019.
2. Sharma JK: "Business Statistics" 2nd Edition Pearson Education, 2007.
3. Arora, PN, Arora, Sumeet and Arora, Amit: "Managerial Statistics", S. Chand, Ist Ed., 2009.
4. Bharadwaj, RS: "Business Statistics" , Excel books, 2nd Ed, 2008.
5. J K Singh, Business Mathematics, 2018, HPH.

BBA SEM-II (CBCS) SYLLABUS 2021-22

PAPER CODE: BB206 FINANCIAL ACCOUNTING

COURSE OBJECTIVE:

To familiarize students with the mechanics of preparation of financial statements, understanding corporate financial statements, their analysis and interpretation.

Course Outcomes

CO-1 : To understand the purpose and principals of Accounting and nature of Accounts.
CO-2: To learn preparation of various types of books.
CO-3: To learn preparation of Financial Statements.
CO-4: To learn analyzing of Financial Statements,
CO-5: To understand the importance of Accounting Standards, procedure for issue and importance of IFRS and Ind-AS

SYLLABUS:

UNIT - I : INTRODUCTION TO FINANCIAL ACCOUNTING :

Accounting as an Information System, Importance and Scope, Limitations; Users of accounting information; Accounting Principles, Accounting Concepts, Principles and Conventions – Generally Accepted Accounting Principles (GAAP); Nature of Accounts

UNIT - II : TYPES OF BOOKS (PRIMARY AND SECONDARY) :

The Accounting Equation Rules of Debit and Credit; Recording Transactions in Journal; Preparation of Ledger Accounts; ledger balancing; Opening and Closing Entries, Preparation of Trial Balance.

UNIT - III : PREPARATION OF FINANCIAL STATEMENTS :

Trading Account, Profit & Loss Account and Balance Sheet, Adjustment Entries, Understanding contents of financial statements of a joint stock company as per the Companies Act2013.

UNIT - IV : FINANCIAL STATEMENT ANALYSIS USING RATIOS :

Objective of financial statement analysis, sources of information, Techniques of financial statement analysis: Horizontal analysis, Vertical analysis and Ratio Analysis; Financial Ratios: Meaning and Usefulness of Financial Ratios. Analysis of ratios- Liquidity Ratios, Solvency Ratios, ProfitabilityRatios and Turnover Ratios; Limitation of ratio analysis.

UNIT – V : INDIAN ACCOUNTING STANDARDS (IND-AS) :

Concept, benefits, procedure for issuing Ind- AS in India, salient features of Ind-AS issued by ICAI; International Financial Reporting Standards (IFRS): Main features, uses and objectives ofIFRS, IFRS issued by IASB.

SUGGESTED BOOKS :

1. Tulsian, P.C., Financial Accounting, Pearson
2. T.S. Grewal, Introduction to Accountancy, Sultan Chand
3. Maheshwari, S.N. & Maheshwari, S.K. , Financial Accounting for B. Com., CA, CS, & ICWA(Foundation) Courses, Vikas Publishing House Pvt. Ltd.
4. Ghosh, T.P., Financial Accounting for Managers, Taxmann Allied Services (P) Ltd.
5. Balwani, Nitin, Accounting and Finance for Managers

SEMESTER-III

BBA SEM-III (CBCS) SYLLABUS 2021-22

PAPER CODE: BB304 HUMAN RESOURCE MANAGEMENT

COURSE OBJECTIVE:

The aim of this course is to introduce to student the basic concepts related to Human Resource Management which can form foundation to understanding advanced concepts in managing human resources in an organization.

Course Outcomes

CO1- To Understand basic Human Resource Management concept and environment
CO2-To Acquire Human resources, its planning and job analysis.
CO3-To Understand developing about Human Resources such as Training, Career planning.
CO4-To Understand Labour Management
CO5- To Understand performance appraisal

SYLLABUS:

UNIT – I : INTRODUCTION TO HUMAN RESOURCE MANAGEMENT AND ENVIRONMENT :

Functions of Human Resource Management. Managerial and operative role of Human Resource Management. Personnel Management vs. Human Resource Management – Strategic Management Approach. The Role of Globalization in HR Policy and Practice.

UNIT – II : ACQUIRING HUMAN RESOURCES :

Human Resource Planning and Alignment – Job Analysis and Design. Job Description, Job Specification and Job Evaluation, Job- Restructuring – Job Rotation, Job Enlargement and Job Enrichment. Recruitment and Selection – Placement – Induction and Orientation. Line and Staff.

UNIT – III : DEVELOPING HUMAN RESOURCES :

Training and Development – Employee Training and Retraining – Assessing Training Needs and Designing Training Programmes. An overview on employee orientation: Career Planning and Development: Role and Significance of Career Planning – Impact of Career Planning on Productivity.

UNIT - IV: LABOUR MANAGEMENT :

Industrial Relations and Industrial Disputes. Principles and guidelines for effective handling of Industrial Disputes and Industrial Relations – Standing Orders – Role and Contents of standing orders – Labour Relations and Collective Bargaining – Employee Health and Safety.

UNIT – V : REWARDING HUMAN RESOURCES :

Performance Appraisal – Methods and needs for Performance Appraisal – Organization Climate and its impact on HRM. Components of Organization Culture. Quality of Work Life – Determinants of quality of work life. Impact of QWL on Organization Climate and Culture.

SUGGESTED BOOKS :

1. Human Resources - Bernandin H. John. TMH
2. Managing Human Resources – Wayne E. Casio. – TMH
3. Human Resources Management – David Lepak and Mary Gowan – Pearson
4. Human Resources Management – Decenzo and Robbins – John Willey
5. Human Resource Management. Texts and Cases. - TMH
6. Human Resource Management, P Subba Rao, HPH, 2009
7. Human Resource Management, Sen Gupta, 2018 1st Edition, Sage Publication

BBA SEM-III (CBCS) SYLLABUS 2021-22

PAPER CODE: BB305 INFORMATION TECHNOLOGY FOR BUSINESS

COURSE OBJECTIVE:

The Objective of this course is to familiarize management students to basics of IT, its applications and importance to present day management and organization.

Course Outcomes

CO1- Implement basic computer system such as Hardware, Software, Memory and Network & its Topologies.
CO2- To Understand the concepts of Information systems and DBMS
CO3- To Understand the concepts of multimedia
CO4- To Understand Internet concepts & security issues.
CO5- To Understand applications of office Management.

UNIT - I : INTRODUCTION TO IT :

Computer Systems- Hardware -I/O devices, Memory devices, Processors-Software - classification of software- systems software, Application software- Operating Systems- Definition- Types of OS- Understanding of GUI- Networks- Definition- Types of Network- LAN, WAN- Network Topologies- Physical Communication Media-TCP/IP, OSI Model.

UNIT – II : INTRODUCTION TO IS :

Definition of Data, Information & Knowledge, IS- MIS, DSS, Expert Systems–Types of IS- Operation, Tactical, Strategic IS- Executives Information Systems (EIS) – Definitions- Data Base, DBMS, Advantages & Disadvantages of DBMS-Ethical and Social Issues in IS.

UNIT - III : MULTIMEDIA CONCEPTS :

Definition of Multimedia - Multimedia devices - Multimedia Formats - Audio formats- Video formats - Compression/ Decompression issues - Business Applications of Multimedia.

UNIT – IV : INTERNET & SECURITY ISSUES :

Internet – History- Internet Addressing and architecture-WWW – Architecture-Browser-Servers- Search engines -Internet Services- Email- Chatting- Messaging- Groups- Social Networking- Internet in Business- definition of e-commerce, m-commerce- types of online business-Security Issues in Internet.

UNIT – V : OFFICE MANAGEMENT APPLICATIONS :

Intranets, Extranets, VPN- Internet Telephony - Group ware- audio and video Conferencing- Wireless Communication - WLANS- Definitions of Blue tooth - Wi Fi- Wi Max – RFID - Use of Spreadsheets for office - spread sheet applications (MS-EXEL) - Use of Databases for the Office (MS-ACCESS) - Database applications.

SUGGESTED BOOKS :

1.Kenneth C. Laudon & Jane P. Laudon - Management Information Systems - Managing the Digital Firm, Pearson Education, Fourth Edition 2008.
2.Turban, McLean, Wetherbe- Information Technology For Management, Wiley Student Edition- Fourth Edition.
3.Leonard Jessup, Joseph Valacich – Information Systems Today, Why IS matters, Pearson Education –Low Price Edition, Second Edition.
4.Effy Oz- Management Information systems, Thomson Course Technology, Fifth Edition.

BBA SEM-III (CBCS) SYLLABUS 2021-22

PAPER CODE: BB306 FINANCIAL MANAGEMENT

COURSE OBJECTIVE:

To acquaint students with the techniques of financial management and their applications forbusiness decision making.

Course Outcome

CO1- To understand the meaning of financial management and to know the difference between Profit Maximization and Wealth Maximization.
CO2- To understand the concept of Time value of Money and its importance in decision making.
CO3 – Awareness as to sources of long-term finances.
CO-4 - To understand how to manage Working Capital Management.
CO-5 - To understand how to manage Receivables.

SYLLABUS:

UNIT – I : NATURE OF FINANCIAL MANAGEMENT :

Finance and relation with other disciplines; Scope of Financial Management; Profit Maximization Vs. Wealth Maximization Vs. Value Maximum Traditional and Modern Approachof FM; Functions of finance – Objectives of Financial Management; Investment Decision, Financing Decision, Current Assets Management Decision and Dividend Decision - Organization of finance function;

UNIT – II : CONCEPT OF TIME VALUE OF MONEY :

Concept of Time Value of Money, compounding, discounting, present value, future value, and annuity; capital budgeting –meaning, features; applications of Discounted Cash Flow (DCF) in capital budgeting, calculation of NPV and IRR

UNIT - III : SOURCES OF LONG TERM FINANCE :

Sources of Long term finance- features of equity shares, preference shares, debentures, long term loans; Capital Structure – meaning, determinants of capital structure; cost of capital – component costs of capital, weighted average cost of capital; Dividend Policy Decision – types of dividend, determinants of dividend policy.

UNIT - IV: WORKING CAPITAL MANAGEMENT :

Gross Vs net working capital, determinants of working capital; Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique (Lock box, concentration banking)

UNIT - V: RECEIVABLES MANAGEMENT – OBJECTIVES :

Credit Policy, Cash Discount, Debtors Outstanding and Ageing Analysis; Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; EOQ (Basic Model); Reorder Level; Safety Stock.

SUGGESTED BOOKS :

1. Eugene.F. Brigham, Fundamentals of Financial Management, The Dryden Press, 6th edition, 1992
2. M.Y. Khan & P.K. Jain , Financial Management, Tata McGraw Hill Publishing Co. Ltd.
3. Prasanna Chandra, Fundamentals of Financial Management, McGraw Hill Education, 6th edition, 2015
4. I.M. Pandey, Financial Management, Vikas Publishing House, 11th edition, 2015
5. J.V. Horne & J.M. Wachowicz, Fundamentals of Financial Management, Prentice Hall ofIndia, 13th edition, 2009.
6. Rustogi, Financial Management, TaxMann, 5th edition, 2011.

SEMESTER-IV

BBA SEM-IV (CBCS) SYLLABUS 2021-22

COURSE- SEC-4 COURSE CODE: BB401(b)
START UP MANAGEMENT

OBJECTIVE:
It helps the students to acquaint themselves with the special challenges of starting new ventures andintroducing new product and service ideas.

UNIT – I: ENTREPRENEUR AND ENTREPRENEURSHIP :
Evolution of the Concept of Entrepreneur. Characteristics of an Entrepreneur. Distinction Betweenan entrepreneur and a Manager. Functions of an Entrepreneur. Traits/ Qualities of Entrepreneurs: Types of Entrepreneurs. Role of Entrepreneurship in Economic Development. Growth of Entrepreneurship in India. Problems and Development of Rural Entrepreneurship.

UNIT – II: ROLE OF SUPPORT INSTITUTIONS & MANAGEMENT OF SMALL ENTERPRISES:
Entrepreneurship Development Programmes (EDPs) – Phases of EDP's and Evaluation of EDPs. Institutional Finance to Entrepreneurs like Commercial Banks–Other Major Financial Institutions such as IDBI, IFCI, IIBI, LIC, UTI, NABARD, SFCs, SISI, SIDCs, SIDBI, and EXIM Bank and
venture capital firms. Role of Small Enterprises in Economic Development. Ownership Structures,MSME act.

SUGGESTED BOOKS :

1. Vasanth Desai, "Dynamics of Entrepreneurial Development and Management", 2007, HPH,Millenium Edition.
2. S.S. Khanka, "Entrepreneurial Development", 2007, S. Chand & Co. Ltd.
3. Poornima. M Charantimath, "Entrepreneurial Development and Small Business Enterprises"2006, Pearson Education.
4. David H. Hott, "Entrepreneurship New Venture Creation", 2004, PHI.
5. P. Narayana Reddy, "Entrepreneurship – Text and Cases", 2010, 1st Ed. Cengage Lerning.
6. Longencker, Morge, Mitchell, "Managing Small Business", Sage South Asia Edition.

BBA SEM-IV (CBCS) SYLLABUS 2021-22

PAPER CODE: BB404 BUSINESS LAW & ETHICS

COURSE OBJECTIVE:

It helps the students to understand importance of contracts companies act & ethics.It focuses on legal aspects of contracts.

COURSE OUTCOMES:

CO1: To understand Introduction of law & Indian Contract act and its case studies
CO2: To Understand about special contracts and sale of goods act.
CO3: To Understand about company , its formation, directors, meetings.
CO4: To understand consumer protection law in India, rights of consumer awareness, Pollution and Environmental Control Law
CO5: To Understand Business ethics and efficiency.

SYLLABUS:

UNIT - I : LAW OF CONTRACTS :

Definition of Contract and Agreement – Classification of Contracts, Essential elements of a valid Contract – Offer - Acceptance - Consideration - Capacity to Contract - Free consent, void Contracts– Legality of Object - Performance of Contract – Remedies for breach of Contract - QuasiContracts.

UNIT – II : LAW RELATING TO SPECIAL CONTRACTS :

Salient features of Contract of Agency, Bailment and Pledge, Indemnity and Guarantee. Sale of Goods Act – Distinction between Sale and agreement to sell - Conditions and Warranties.

UNIT – III : COMPANIES ACT :

Definition of company – Characteristics - Classification of Companies- Formation of Company - Memorandum and Articles of Association – Prospectus - Share holders meetings - Board meetings - Law relating to meetings and proceedings- Company - Management - Qualifications, Appointment, Powers, and legal position of Directors - Board - M.D and Chairman - Their powers.

UNIT - IV: CONSUMER PROTECTION LAW :

Introduction to consumer protection law in India - Consumer councils - Redressal machinery - Rights of consumers - Consumer awareness. Pollution Control Law - Air, water, and environmentpollution control.

UNIT - V: BUSINESS ETHICS :

Ethical and Value based Considerations – Need and Justification – Business ethics and efficiency – Social responsibility of business – Fair and just cooperation among owners, managers, workers and customers – Fair Market Wages – Integrity and ethical consideration in business operations – Indianvalue system and it's relevance in Management**.**

SUGGESTED BOOKS :

1. N.D. Kapoor, "Elements of Mercantile Law", 2015, Sultan Chand & Co.
2. K.R. Bulchandani, "Business Law for Management", 2018, HPH.
3. PPS Gogna, "A Text Book of Company Law", 2006, S. Chand
4. Marianne moody Jennings, "The Legal, Ethical and Global Environment of Business", 2009,South western Cengage learning, New Delhi.
5. Richard Schaffer, Agusti& Earle.
6. V. Ramakrishna Raju, "Business Laws and Economic Legislations", 2005, HPH.

BBA SEM-IV (CBCS) SYLLABUS 2021-22

PAPER CODE: BB405 MARKET RESEARCH

COURSE OBJECTIVE:

To provide an exposure to the students pertaining to the nature and Scope of marketing research, which they are expected to possess when they enter the industry as practitioners. To give them an understanding of the basic techniques and tools of marketing research.

Course Outcome

CO-1 : To understand need for marketing research and process of marketing research.
CO-2 : To present various sources of data and its collection.
CO-3 : To present various sources of secondary data
CO-4: To understand various measurement and scaling techniques.
CO-5: To understand various Sampling methods available.

SYLLABUS:

UNIT - I : MARKETING RESEARCH :

Nature and Scope of Marketing Research – Role of Marketing Research in Decision Making. The Research process – Steps in the Research Process; Designing the Research Proposal.

UNIT – II : SOURCES OF DATA :

Sources of data, Primary data and Secondary data, Survey method of data collection, Observation method – Types of observation, Interview, Depth interview , Focus group interview, Questionnaire, Method, Steps in design of a questionnaire

UNIT – III : SECONDARY METHOD OF DATA COLLECTION :

Advantages & Disadvantages of Secondary
Data, Criteria for evaluating secondary sources, Secondary sources of data in Indian Context,

UNIT – IV : MEASUREMENT AND SCALING :

Concept of measurement and scaling – Types of Scales – Nominal ,Ordinal, Interval and Ratio Scales - Attitude scales Thurstone, Likert, Semantic differential scales, Reliability and Validity of ascale.

UNIT – V : SAMPLING :

Sampling techniques, Data Analysis: Z test (mean, diff. of mean, diff. of proportion) t test (mean),paired t test, Chi square test. Introduction to theoretical concept of ANOVA,

SUGGESTED BOOKS :

1. Green E. Paul, Tull S.Donald & Albaum, Gerald: "Research for Marketing Decisions", 2018,PHI.
2. Tull and Hawckins, "Marketing Research", 2000, 4th Ed. Tata McGraw Hill.
3. Cooper & Schindler: Business Research Methods McGraw-Hill Education.
4. Martin callingam, "Market intelligence", 2009, Kogan Page Publishers.
5. G.C. Beri, "Marketing Research", 2008, 8th Ed, Tata McGraw Hill.
6. Malhotra, K. Naresh, "Marketing Research- And applied orientation", 2014.
7. Kumar, Marketing Research, 2015, Sage Publication.

BBA SEM-IV (CBCS) SYLLABUS 2021-22

PAPER CODE: BB406 MANAGEMENT SCIENCE

COURSE OBJECTIVE:

The objective of this course is to provide the student with adequate knowledge regarding the basic manufacturing facilities & how service activities have attained significance and need managerial skills to address the problems.

Course Outcome

CO-1: To understand the production and operations process and its functions.
CO-2 To understand the importance of capacity planning, factory location, plant layout, sequencing of operations and work study
CO-3: To present the various purchase and stores management techniques.
CO-4: To know the importance of Operations Research and Linear Programming.
CO-5: To understand Transportation, Assignment and Queuing techniques.

SYLLABUS:

UNIT – I : INTRODUCTION TO PRODUCTION & OPERATIONS MANAGEMENT :

Definition of Production and Operations. An overview of Manufacturing processes:
Functions of Production, Planning & Control. Interface of Product Life Cycle & Process Life Cycle. Process design – Project, Job, Batch, Assembly and Continuous process.

UNIT – II : PLANT MANAGEMENT AND WORK STUDY :

Capacity Planning, factory location, plant layout – types of layout.Sequencing of Operations: n-Jobs with one, two and three facilities.

Work Study: The concept and various techniques of methods analysis and work measurement.

UNIT – III : PURCHASE AND STORES MANAGEMENT :

Purchase Management: Sources of Supply of Materials, selection, evaluation of Vendors. Methodsof vendor rating.

Stores Management: Functions of Stores and Materials control. Classification, Codification, Simplification and Standardization of materials. Economic Order Quantity. Selective Inventory Control Techniques: ABC, VED, FNSD & XYZ.

UNIT – IV : INTRODUCTION TO OR :

Introduction to Operation Research: Introduction, Nature, Managerial applications and limitationsof OR. Types of Operation Research Models.

Linear Programming: Mathematical model, Formulation of LPP, assumptions underlying LPP,Solution by Graphical Method.

UNIT – V : TRANSPORTATION, ASSIGNMENT AND QUEUING THEORY :

Transportation Problem (TP) - Mathematical model, IBFS using North West Corner Rule, Least Cost Method (LCM) and Vogel's Approximation Method(VAM).

Assignment Problem (AP): Mathematical model, method of obtaining solution- Hungarian method. Queuing Theory - Concepts of Queue - General structure of a Queuing system-OperatingCharacteristics of Queues.

SUGGESTED BOOKS :

1. S.N. Chary, "Production & Operation Management" 5th Edition, Tata-McGraw – HillPublishing Company Ltd.
2. N.G. Nair, "Production and Operation Management", 2nd Edition, Tata-McGraw – HillPublishing Company Ltd.
3. Kanishka Bedi, "Production and Operations Management", 2007, 3rd Edition, Oxford UniversityPress.
4. N.D. Vohra, "Quantitative Techniques in Management", 2010, 4th Edition, Tata-McGraw – HillPublishing Company Ltd.
5. J.K. Sharma, "Operations Research Theory and Applications 2009, 4th Edition, Macmillan.

SEMESTER-V

BBA SEM-V (CBCS) SYLLABUS 2021-22

PAPER CODE: BB504 BRAND MANAGEMENT

COURSE OBJECTIVE:

To provide an understanding of Different Types of Brand Awareness, Equity.

Course Outcomes:

CO1-TO understand tje nature, scope and the meaning with significance of branding.
CO2- TO create the awareness in branding and advertising and their strategies.
C03- To understand the cincept of brand extensions .
C04- TO learn about the brand positioning and re-positioning personality.
C05- To understand the sources of branding and the concept of brand equity.

UNIT - I : INTRODUCTION TO BRAND MANAGEMENT :

Concept of Branding – Definition – Significance of Brand - Brand Types – Difference betweenBrand and Product – Braking – Brand Building – Brand Launching.

UNIT - II : BRAND AWARENESS :

Branding and Advertisement – Creating Brand Awareness – AIDA Model – Branding Strategies –Brand Communication.

UNIT - III : BRAND EXTENSION :

Brand Line Extension – Horizontal Extension Pros and Cons of Brand Extension – RelatedExtension – Unrelated Extension – Brand Generic Branding.

UNIT - IV : BRAND PERSONALITY :

Branding – Brand Personality – Brand Positioning – Re Positioning – Brand Positioning Strategies – Brand Positioning Variables.

UNIT - V : BRAND EQUITY :

Concept of Brand Equity – Brand Awareness – Personality – Positioning – Enhancing Brand Equity – Brand Management – Planning – Sources Brand.

SUGGESTED BOOKS :

1. Brand Management - Gulnar sharma, Karan Singh Khundia – Himalaya PublishingHouse
2. Brand Management: Principles and Practices - Kirti Dutta - Oxford University Press.
3. Brand Management: The Indian Context - YLR Moorthi - Vikas Publishing House

BBA SEM-V (CBCS) SYLLABUS 2021-22

PAPER CODE: BB505 RETAIL MANAGEMENT

COURSE OBJECTIVE:

This course introduces the role of retailing and various formats and theories.It focuses on distribution management.

Course Outcomes:

CO1- To understand the role of retailing and concept of FDI in Indian Retailing.
CO2- To understand the theories and formats of Retail Development.
CO3- To know the meaning of Merchandising and analysing performance.
CO4- To create the awareness of Retail store designs and its significance.
CO5- To know the role of physical distribution management.

SYLLABUS:

UNIT – I : INTRODUCTION TO RETAIL MANAGEMENT :

Retailing: Role, Relevance and Trends - Introduction to retailing - Types of Retailing, Characteristics of Retailing, Functions and activities of Retailing.
Emergence and growth of Retailing in India, FDI in Indian Retailing.

UNIT – II : RETAIL FORMATS AND THEORIES :

Traditional retail formats – cooperatives and Government and Modern Retail formats in India; Emergence of Malls in India; Franchising – Types of Franchising, Advantages and disadvantages of franchising; legal issues in franchising in India.
Theories of Retail Development – Environmental theory, cyclical theory, conflict Theory and Concept of Life cycle in retail

UNIT – III : MERCHANDISE MANAGEMENT :

Meaning of Merchandising, Factors influencing Merchandising, Functions of Merchandising Manager, Merchandise planning, Merchandise buying, Analyzing Merchandise performance

UNIT – IV : RETAIL STORE DESIGN :

Store layout, significance of Store layout, types of store layout, layout selection - Chief Considerations, Need and Importance of Store Environment, Visual Merchandising, Promotions Strategy, Retail Communication Mix and POP Displays.

UNIT – V : DISTRIBUTION MANAGEMENT :

Role and functions of channels of distribution, selecting channel Members – Criteria; Motivating the Channel participants, controlling channel participant, Managing Channel Conflicts, Physical Distribution System.

SUGGESTED BOOKS :

1. Retail Marketing Management - Second Edition – David Gilbert - Pearson Education
2. Retailing Management - Swapna Pradhan – Tata Mcgraw Hill
3. Contours of Retailing Management - S.A. Chunawalla - Himalaya Publishing House
4. Retail Management - Gibson G. Vedamani – Jaico Books
5. The Art of Retailing - A. J Lamba - Tata Mcgraw Hill
6. Sales and Distribution Management - Dr. S. Gupta - Excel Books
7. Sales and Distribution Management - Panda & Sahadev - Oxford University Press

BBA SEM-V (CBCS) SYLLABUS 2021-22

PAPER CODE: BB506 CUSTOMER RELATIONSHIP MANAGEMENT

COURSE OBJECTIVE:

To know the importance of customer involvement and relations with corporations making the student know and build beneficial relations.

Course Outcomes:

CO1- To understand the concept and evolution of Customer Relationship.
CO2- TO Know the CRM concepts and its significance.
CO3- To know the steos in planning and Strategy development process in CRM.
CO4- To understand the CRM marketing innitiatives and service sectors.
CO5- TO understand the Implementation problems in CRM.

UNIT – 1 : EVOLUTION OF CUSTOMER RELATIONSHIP :

CRM – Definition, Emergence of CRM Practice, Factors responsible for CRM growth, CRM Process, framework of CRM, Benefits of CRM, Types of CRM, Scope of CRM, Customer Profitability.

UNIT – II : CRM CONCEPTS :

Customer Value, Customer Expectation, Customer Satisfaction, Customer Acquisition, Customer Retention, Customer Loyalty, Customer Lifetime Value. Customer Experience Management, Customer Profitability.

UNIT – III : PLANNING FOR CRM :

Steps in Planning – Building Customer Centricity, Setting CRM Objectives, Defining Data Requirements, Planning Desired Outputs, Relevant issues while planning the Outputs, Elements ofCRM Plan, CRM Strategy: The Strategy Development Process.

UNIT – IV : CRM AND MARKETING STRATEGY :

CRM Marketing Initiatives, Sales Force Automation, Campaign Management, Call Centers.Practice of CRM. CRM in Consumer Markets, CRM in Services Sector.

UNIT – V : CRM PROBLEMS IN IMPLEMENTATION :

Issues and Problems in Implementing CRM, Information Technology Tools in CRM, Challenges of CRM Implementation. CRM Implementation Roadmap, Road Map (RM).

SUGGESTED BOOKS :

1. Jagdish N. Sheth, Atul Parvatiyar & G Shainesh, "Customer Relationship Management",Emerging Concepts, Tools and Application", TMH
2. Francis Buttle, "CRM: Concept and Technologies", Elsevier, a division of Read Elseview IndiaPvt. Ltd.
3. Dilip Soman & Sara N – Marandi, "Managing Customer Value" Cambridge.
4. Alok Kumar Rai, "Customer Relationship Management: Concepts and Cases", PHI.
5. Ken Burnett, the Handbook of Key "Customer Relationship Management", Pearson Education.
6. Mukesh Chaturvedi, Abinav Chaturvedi, "Customer Relationship Management – An Indian Perspective", Excel Books
7. K Govind Bhat, "Customer Relationship Management", (2018), HPH.

SEMESTER-VI

BBA SEM-VI (CBCS) SYLLABUS 2021-22

COURSE- GE-2 COURSE CODE: BB601(a)
BUSINESS ANALYTICS

OBJECTIVE:
The course aims to provide an understanding of basics concepts related to Business Analytics andpractical approach using MS-EXCEL and simple programming concepts in R.

UNIT – I : INTRODUCTION TO BUSINESS ANALYTICS :
Definition, Types of Analytics-Descriptive, Predictive and Prescriptive, Business Analytics Applications in Different Areas (BA in Practice), Big Data.

UNIT – II: DESCRIPTIVE ANALYTICS 1 :
Types of Data- Population and Sample Data, Quantitative and Categorical Data, Cross-Sectional and Time Series Data, Sources of data, Descriptive Statistics- Measures of Location (central Tendency)-Mean, Median and Mode and relationship between them – Problems.

UNIT – III: DESCRIPTIVE ANALYTICS 2 :
Measures of Variability-Range, Variance, Standard deviation, Coefficient of Variation, Percentiles, Quartiles, Analyzing Distributions – Empirical Rule, Identifying Outliers, Box Plots, Measures of Association -Scatter Charts, Covariance, Correlation Coefficient – Problems.

UNIT – IV: PREDICTIVE ANALYTICS :
Trend Analysis, Regression Analysis- Least Square Method, Assessing the Fit of Simple Linear Regression, Coefficient of Determination, Introduction to Data Mining- Definition, Methods of Data Mining, Applications of Data Mining.

SUGGESTED BOOKS :

1. Camm, Cochran, Fry, Ohlmann, Anderson, Sweeney, Williams- Essentials of BusinessAnalytics, Cengage Learning.
2. James Evans, Business Analytics, Pearson, Second Edition, 2017.
3. Albright Winston, Business Analytics- Data Analysis-Data Analysis and Decision Making,Cengage Learning, Reprint 2016.
4. Sahil Raj, Business Analytics, Cengage Learning.

BBA SEM-VI (CBCS) SYLLABUS 2021-22

COURSE: PROJECT CODE- BB601(b)

PROJECT REPORT AND VIVA

Student should choose a topic based on his elective chosen in the final year and make a study andprepare a report which will be evaluated through a viva-voce.

BBA SEM-VI (CBCS) SYLLABUS 2021-22

PAPER CODE: BB604 BUYER BEHAVIOUR

COURSE OBJECTIVE:

To understand the depth concept & theories of Consumer buying BehaviourTo Focus on Learning theories

To Know the impact of culture on Buyer Behaviour

Course Outcomes :

1. Be able to identify the dynamics of human behavior and the basic factors that influence the consumers' decision process .
2. To understand the depth concept & theories of Consumer buying Behavior
3. To Know the impact of culture on Buyer Behavior.
4. To understand and evaluate the alternatives in the buying decision process.
5. To understand different models of buyer behavior and be able to demonstrate how they may be applied to marketing strategy

SYLLABUS:

UNIT – I : INTRODUCTION TO BUYER BEHAVIOUR :

Understanding basics of Buyer Behaviour, Factors effecting Buyer Behaviour, Concept and theories of motivation, Personality and Attitudes. Perception and its implications. Role of behavioural factors in framing Marketing Strategies.

UNIT – II : THEORIES OF BUYER BEHAVIOUR :

Learning principles; Concepts of conditioning, important aspects of information processing theory. Promotional tools as source of information; encoding and Information Retention, Retrieval of information.

UNIT – III : IMPACT OF CULTURE ON BUYER BEHAVIOUR :

Social and Cultural Settings: Social Class, Indian Socio – Cultural frames; Culture, elements of culture, Sub-culture and Cross culture and Cross cultural marketing practices. Family Life Cycle- Changing aspects of family size.

UNIT – IV : BUYER BEHAVIOUR DECISION :

Buyer decision making: Information Search, sources of information, evaluation of alternatives. Steps between evaluation of alternatives and purchase decision. Buyer action and disposal of products.

UNIT – V : MODELS OF BUYER BEHAVIOUR :

Basic Model of Buyer Behaviour: Generic Model of Buyer Behaviour, Howard Sheth Model, Engels Consumer Theory, Consumerism, Buyer rights – Protection of Buyer rights in India.

SUGGESTED BOOKS :

1. Schiffman and Kannik, “Consumer Behavior”, 2018, Pearson Education / PHI.
2. Dinesh Kumar Consumer Behavior Consumer Behaviour, 2014, oxford University Press

3. Gary Lilien, "Marketing Models", 2018, PHI.
4. Suja R. Nair, "Consumer Behaviour in Indian perspective", 2010, HPH.
5. Sheth and Mittal, "Consumer Behavior", 2004, Thomson Learning.
6. Stish Batra, "Consumer Behavior", 2009, Excel Books New Delhi.

BBA SEM-VI (CBCS) SYLLABUS 2021-22

PAPER CODE: BB605 ADVERTISING AND SALES PROMOTION

COURSE OBJECTIVE:

It helps the students to understand the important of advertisements for promotion of products.It focuses on media planning, personal selling and sales promotion.

Course Outcomes:

1.It helps the students to understand the importance of advertisements for promotion of products.
2. To understand Communication decision process, Types of Advertisements, Creative Approaches and Execution styles. Advertisement Appeals.
3.Identify the different range and characteristics of media evaluate the effectiveness of different media in relation to advertising
4.students will have the ability to demonstrate the theories and concepts that are central to personal selling
5.To understand different types and tools of Sales promotion and Implement the best sales management strategy for organization

SYLLABUS:

UNIT – I : INTRODUCTION :

Introduction a promotion mix, Elements of Promotion mix, types of promotion budget, promotionStrategies – Push Strategy and Pull Strategy.

UNIT – II : CREATION OF ADVERTISEMENT :

Model of mortally Communication decision process. Advertisement, Types of Advertisements.Concept of creativity. Creative Approaches and Execution styles. Advertisement Appeals – Emotion and Rational Appeals.

UNIT – III : MEDIA PLANNING :

Media planning, Types of Media, Media Vehicles, Media Concentration V/s Media Disruption.Media scheduling.

UNIT – IV : PERSONAL SELLING :

Introduction to personal selling, Role and Importance of Personal Selling, Theories of PersonalSelling. Personal Selling process. Personal Selling in Service Industry.

UNIT – V : SALES PROMOTION :

Sales Promotion – Objectives Types of Sales Promotion – Trade oriented Sales Promotion andConsumer Oriented Sales Promotion.

Consumer Sales Promotion Tools : Off – Self Offers, Price Promotions, Premium Promotions.

SUGGESTED BOOKS :

1. David Aaker, "Advertisement Management", 2018, HPH
2. Belch & Belch, "Advertising and Promotion", TMH.
3. Aaker, Kumar, "Advertising Management", PHI.
4. S.A. Chunawalla, "Advertising Management", HPH.

5. Still Rechard, Sales Management, Latest Edition, 2018, Prentice Hall

BBA SEM-VI (CBCS) SYLLABUS 2021-22

PAPER CODE: BB606 RURAL MARKETING

COURSE OBJECTIVE:

The objective of the course is to introduce rural market dynamics to the students so that they canlearn about rural behavior and factor that differs from urban market.

Course Outcomes :

CO1.To expose the learners to the issues of Rural markets ,Reforms and Development in the last few decades.

CO2.To help the students in understanding the nature ,characteristics of rural markets and consumers and their buying decision process.

CO3.To understand Product Mix Decisions and Competitive product strategies for Rural Markets.

CO4. To understand Innovative pricing methods for Rural Markets ,Appropriate Media & Designing Right Promotion Mix.

CO5.To analyze appropriate channels of distribution and to explore new approaches to reach out rural markets

SYLLABUS:

UNIT – I : RURAL ECONOMY & DEVELOPMENT :

Rural Economy – Rural – Urban disparities – policy interventions required – Rural face to Reforms – The Development in the last few decades.

UNIT – II : RURAL MARKETING & RURAL BUYING DECISION PROCESS :

Rural Marketing – Concept and Scope – Nature of Rural Markets – Attractiveness of Rural Markets – Rural Vs Urban Marketing - Characteristics of Rural Consumers – Buying Decision Process –Potential and Size of the Rural Markets.

UNIT – III : PRODUCT MIX DECISIONS :

Product Strategy – Product Mix Decisions – Decisions Involved in Product, Branding, Packaging, Product Line and Product Mix Decisions. New Product Development, Product Life Cycle,Competitive product strategies for Rural Markets.

UNIT – IV : PRICING & PROMOTION STRATEGY :

Pricing Strategy – Pricing Policies – Innovative pricing methods for Rural Markets – Promotion Strategy – Appropriate Media – Designing Right Promotion Mix – Promotional Campaigns.

UNIT – V : RURAL DISTRIBUTION :

Distribution – Problems encountered – Selection of appropriate channels – New approaches to reach out rural markets – Electronic applications. Rural Marketing Information System.

SUGGESTED BOOKS :

1. Balaam Dogra & Karminder Ghuman, Rural Marketing: Concept & Cases, Tata McGraw HillPublishing Company, New Delhi.
2. CSG Krishnamachary & Lalitha Ramakrishna, Rural Marketing, Pearson Education, Asia
3. A K Singh & S Pandey, Rural Marketing, Indian Perspective, New Age International Publishers
4. Philip Kotler, Marketing Management, Prentice –Hall India Ltd, New Delhi
5. Ruddar Dust Sundaram, Indian Economy, Tata McGraw Hill Publishers, New Delhi

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.Com (COMPUTER APPLICATIONS / TAX PROCEDURES & PRACTICE)

(With effect from batch of students Admitted from the Academic year 2020-21 onwards under semester system of CBCS)

COURSE STRUCTURE, SYLLABUS, POs, PSOs & COs

PROGRAMME OUTCOMES

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAMME SPECIFIC OUTCOMES

PROGRAMME		SPECIFIC OUTCOMES
B.COM(GEN) E/M,T/M	**PSO 1**	To understand the nature, scope and concepts of Accounting, Business Operations and Management
	PSO 2	The Analysis the relationship between, Accounting, Auditing and taxation
	PSO 3	To understand the application of Corporate Accounting Principle and Practice in real time business situation
	PSO 4	To equip the students with leadership skills and knowledge in computing skills
	PSO 5	To make them learn the latest techniques and their application in modern business operation
B.COM (CA) E/M,T/M	**PSO 1**	To understand the nature, scope and concepts of Accounting, Business Operations and Management
	PSO2	To understand to enable the students to understand to concepts of computer software and its application in business operation
	PSO 3	To equip the students with business Analysis and E-commerce Skills
	PSO 4	To develop the students with Communication, leadership and environmental skills
	PSO 5	To make them learn the latest technologies and their application in modern business operation
B.COM (TAXATION AND ADVERTISING)	**PSO 1**	File income tax return and compute the tax liability of individuals
	PSO 2	To develop proficiency in the management of an organization
	PSO 3	Attain skills in conducting in Business transaction in online
	PSO 4	Students will understand the concepts of creativity in acts of depth with the knowing of growing of creativity in Ads in today's competitive world
	PSO5	The courses enables the students to develop skills required for jobs in Advertising, Personal selling and salesmanship
B.B.A	**PSO1**	Understand the functional areas in business , accounting, marketing, finance, Economics, Law and Management
	PSO 2	Understand the Process of identifying business, opportunities and threats
	PSO 3	Ability to address business problems and address ethical issues in the business environment
	PSO 4	Ability to predict the changes in business environment and their impact on global markets
	PSO 5	Employ effective communicative skills

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET,

HYD-16

FIRST YEAR
SEMESTER: I

(An autonomous college of Osmania University)
Re-Accredited by NAAC with "B" Grade

Faculty of Commerce

STRUCTURE OF B.COM Course w.e.f the academic year 2020-2021

B.COM (COMPUTER APPLICATIONS) PROGRAMME

SL.NO	CODE NO	TITLE OF THE PAPER	HPW	CREDITS	EXAM DURATION	MAX MARKS
1	AECC1	a)Environmental Science	2	2	1 ½ hours	50 marks
2	DSC101	Financial Accounting-I	5	5	2 ½ hours	60 E+40 I=100
3	DSC102	Business Organization and Management	5	5	2 ½ hours	60 E+40 I=100
4	DSC103	Fundamentals of Information Technology	3T+4P	5	2 ½ hours	60 E+40 I=100
		Total	19	17		

SEMESTER:II

SL.NO	CODE NO	TITLE OF THE PAPER	HPW	CREDITS	EXAM DURATION	MAX MARKS
1	DSC201	Financial Accounting-II	5	5	2 ½ hours	60 E+40I=100
2	DSC202	Business Laws	5	5	2 ½ hours	60 E+40I=100
3	DSC203	Programming with C & C++	3T+4P	5	2 ½ hours	60 E+40I=100
4	AECC2	a)Basic Computer Skills	2	2	1 ½ hours	50 marks
5		Total	19	17		

SECOND YEAR

SEMESTER:III

S. NO	CODE NO	TITLE OF THE PAPER	HPW	CREDITS	EXAM DURATION	MAX MARKS
1	DSC301	Advanced Accounting	5	5	2 ½ hours	60 E+40I=100
2	DSC302	Business Statistics I	5	5	2 ½ hours	60 E+40I=100
3	DSC303	Relational Database Management System	3T+4P	5	2 ½ hours	60 E+40I=100
4	SEC1 UGC Specified Course	Communication Skills	2	2	1½ hours	40 E +10I=50
5	SEC2 Dept. Specified Course	a)Principles of Insurance	2	2	1½ hours	40 E +10I=50

SEMESTER:IV

S. NO	CODE NO	TITLE OF THE PAPER	HPW	CREDITS	EXAM DURATION	MAX MARKS
1	DSC401	Income Tax	5	5	2 ½ hours	60 E+40I=100
2	DSC402	Business Statistics II	5	5	2 ½ hours	60 E+40I=100
3	DSC403	Web Technologies	3T+4P	5	2 ½ hours	60 E+40I=100
4	SEC3 UGC Specified Course	Leadership and management skills	2	2	1½ hours	40 E +10I=50
5	SEC4 Dept. Specified Course	a)Practice of Life and General Insurance	2	2	1½ hours	40 E +10I=50

THIRD YEAR

SEMESTER:V

S. NO	CODE NO	TITLE OF THE PAPER	HPW	CREDITS	EXAM DURATION	MAX MARKS
1	DSE501	a) Cost Accounting	5	5	2 ½ hours	60 E+40I=100
2	DSE502	a) Computerized Accounting	3T+4p	5	3 hours	50 E+35p+15I=100
3	DSE503	a)Management Information System	3T+4P	5	2 ½ hours	60 E+40I=100
4	GE	a)Business Economics	4	4	3 hours	100

SEMESTER:VI

S. NO	CODE NO	TITLE OF THE PAPER	HPW	EXAM DURATION	MAX MARKS	CREDITS
1	DSE601	a)Cost control and management accounting	5	5	2 ½ hours	60 E+40I=100
2	DSE602	a) Theory and Practice of GST	5	5	3 hours	50 E+35p+15I=100
3	DSE603	a) Multimedia Systems	3T+4P	5	2 ½ hours	60 E+40I=100
4	PR	Research Methodology and Project Report	2T+4R	4	1 ½ hours	40E+10I+35R+15V.V

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS / TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – I

FINANCIAL ACCOUNTING - I

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40 I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire conceptual knowledge of basics of accounting.
2. Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP.
3. Describe the role of accounting information and its limitations.
4. Equip with the knowledge of accounting process and preparation of final accounts of sole trader.
5. Identify and analyze the reasons for the difference between cash book and pass book balances.
6. Recognize circumstances providing for increased exposure to errors and frauds.

Objective: To acquire conceptual knowledge of basics of accounting and preparation of final accounts of sole trader.

UNIT-I: ACCOUNTING PROCESS: Financial Accounting: Introduction – Definition – Evolution – Functions- Advantages and Limitations –Users of Accounting Information- Branches of Accounting – Accounting Principles: Concepts and Conventions- Accounting Standards– Meaning – Importance – List of Accounting Standards issued by ASB -– Accounting System- Types of Accounts – Accounting Cycle- Journal- Ledger and Trial Balance. (Including problems)

UNIT-II: SUBSIDIARY BOOKS: Meaning –Types - Purchases Book - Purchases Returns Book - Sales Book - - Sales Returns Book - Bills Receivable Book - Bills Payable Book – Cash Book - Single Column, Two Column, Three Column and Petty Cash Book - Journal Proper.(Including problems)

UNIT-III: BANK RECONCILIATION STATEMENT: Meaning – Need - Reasons for differences between cash book and pass book balances – Favourable and over draft balances – Ascertainment of correct cash book balance (Amended Cash Book) - Preparation of Bank Reconciliation Statement. (Including problems)

UNIT-IV: RECTIFICATION OF ERRORS AND DEPRECIATION: Capital and Revenue Expenditure – Capital and Revenue Receipts: Meaning and Differences - Differed Revenue Expenditure. Errors and their Rectification: Types of Errors - Suspense Account – Effect of Errors on Profit. (Including problems) Depreciation (AS-6): Meaning – Causes – Difference between Depreciation, Amortization and Depletion - Objectives of providing for depreciation – Factors affecting depreciation – Accounting Treatment – Methods of depreciation: Straight Line Method - Diminishing Balance Method (Including problems)

UNIT-V: FINAL ACCOUNTS: Final Accounts of Sole Trader: Meaning -Uses -Preparation of Manufacturing, Trading and Profit & Loss Account and Balance Sheet – Adjustments – Closing Entries.(Including problems)

SUGGESTED READINGS: 1. Accountancy-I: Haneef and Mukherjee, Tata McGraw Hill Company.

2. Principles & Practice of Accounting: R.L.Gupta&V.K.Gupta, Sultan Chand.
3. Accountancy-I: S.P. Jain & K.L Narang, Kalyani Publishers.
4. Accountancy–I: Tulasian, Tata McGraw Hill Co.
5. Introduction to Accountancy: T.S.Grewal, S.Chand and Co.
6. Advanced Accountancy-I: S.N.Maheshwari&V.L.Maheswari, Vikas.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

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DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS / TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – I

BUSINESS ORGANISATION AND MANAGEMENT

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40 I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Understand the scope of Business, and its importance.
2. Describe the Social Responsibility and Ethics of Business
3. Analyse different forms of business organizations
4. Identify various vital documents of a company
5. Learn various sources Industrial Financial resources
6. Explain the functioning of Stock Exchanges & Mutual funds.

Objective: To acquaint the students with the basics of Commerce and Business concepts and functions, forms of Business Organization and functions of Management.

UNIT-I: INTRODUCTION AND FORMS OF BUSINESS ORGANISATIONS: Concepts of Business, Trade, Industry and Commerce - Objectives and functions of Business –Social Responsibility of a business - Forms of Business Organization - Meaning, Characteristics, Advantages and Disadvantages of Sole Proprietorship – Meaning, Characteristics, Advantages and Disadvantages of Partnership - Kinds of Partners - Partnership Deed -Concept of Limited liability partnership – Meaning, Characteristics, Advantages and Disadvantages of Hindu Undivided Family – Meaning, Advantages and Disadvantages of Co-Operative Organization.

UNIT-II: JOINT STOCK COMPANY: Joint Stock Company - Meaning - Definition - Characteristics - Advantages and Disadvantages - Kinds of Companies - Promotion - Stages of Promotion - Promoter - Characteristics - Kinds - Preparation of Important Documents - Memorandum of Association - Clauses - Articles of Association - Contents – Prospectus - Contents – Red herring Prospectus- Statement in lieu of Prospectus (As per Companies Act. 2013).

UNIT-III: INTRODUCTION TO FUNCTIONS OF MANAGEMENT: Management - Meaning - Characteristics - Functions of Management - Levels of Management – Skills of Management- Scientific Management - Meaning - Definition - Objectives - Criticism – Fayol's 14 Principles of Management .

UNIT-IV: PLANNING AND ORGANISING: Meaning - Definition - Characteristics - Types of Plans - Advantages and Disadvantages – Approaches to Planning - Management by Objectives (MBO) - Steps in MBO - Benefits – Weaknesses—Definition of Organizing-Organization-Process of Organizing - Principles of Organization - Formal and Informal Organizations - Line, Staff Organizations - Line and Staff Conflicts - Functional Organization - Span of Management - Meaning - Determining Span - Factors influencing the Span of Supervision.

UNIT-V: AUTHORITY, COORDINATION AND CONTROL: Meaning of Authority, Power, responsibility and accountability - Delegation of Authority - Decentralization of Authority - Definition, importance, process, and principles of Coordinationtechniques of Effective Coordination - Control - Meaning - Definition – Relationship between planning and control -Steps in Control – Types (post, current and pre-control) - Requirements for effective control.

SUGGESTED READINGS: 1.Business Organization & Management: Sharma Shashi K. Gupta, Kalyani Publishers 2.Business Organisation& Management: Patrick Anthony, Himalaya Publishing House 3.Business Organization & Management: Dr. Manish Gupta, PBP. 4.Organization & Management: R. D. Agarwal, McGraw Hill. 5.Modern Business Organization: S.A. Sherlekar, V.S. Sherlekar, Himalaya Publishing House 6.Business Organization & Management: C.R. Basu, Tata McGraw Hill 7.Business Organization & Management: M.C. Shukla S. Chand,

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

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DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS /TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – II

FINANCIAL ACCOUNTING-II

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:**5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Appreciate the need for negotiable instruments and procedure of accounting for them
2. Evaluate the concept of Consignment and learn its accounting treatment
3. Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture.
4. Determine the ascertainment of profit under Single Entry system.
5. Understand the meaning and features of Non-Profit Organizations
6. Prepare Receipts & Payment Account, Income & Expenditure Account and Balance Sheet for Non-Profit Organizations.

Objective: To acquire accounting knowledge of bills of exchange and other business accounting methods.

UNIT-I: BILLS OF EXCHANGE: Bills of Exchange - Definition- Distinction between Promissory note and Bills of exchange Accounting treatment of Trade bills: Books of Drawer and Acceptor- Honour and Dishonour of Bills- Renewal of bills- Retiring of bills under rebate- Accommodation bills.(Including problems)

UNIT-II: CONSIGNMENT ACCOUNTS: Consignment – Meaning – Features– Proforma invoice - Account sales – Del credere commission-Accounting treatment in the books of the consignor and the consignee - Valuation of consignment stock –Treatment of Normal and abnormal Loss - Invoice of goods at a price higher than the cost price. (Including problems)

UNIT-III: JOINT VENTURE ACCOUNTS: Joint Venture – Meaning –Features-Difference between Joint Venture and Consignment Accounting Procedure-Methods of Keeping Records for Joint Venture Accounts-Method of Recording in co-ventures books-Separate Set of Books Method- Joint Bank Account Memorandum Joint Venture Account (Including problems)

UNIT-IV: ACCOUNTS FROM INCOMPLETE RECORDS: Single Entry System – Meaning -Features–Difference between Single Entry and Double Entry systems -Defects in Single Entry System - Books and accounts maintained - Ascertainment of Profit - Statement of Affairs and Conversion method (Including problems)

UNIT-V: ACCOUNTING FOR NON-PROFIT ORGANIZATIONS: Non- Profit Organization – Meaning – Features – Receipts and Payments Account – Income and Expenditure Account – Balance Sheet(Including problems)

SUGGESTED READINGS: 1. Accountancy-I: Haneef and Mukherjee, Tata McGraw Hill Co.

2. Principles and Practice of Accounting: R.L. Gupta & V.K. Gupta,Sultan Chand & Sons.
3. Accountancy–I: Tulasian, Tata McGraw Hill Co.
4. Accountancy–I: S.P. Jain & K.L Narang, Kalyani.
5. Advanced Accountancy-I: S.N.Maheshwari&V.L.Maheswari, Vikas.
6. Advanced Accountancy: M Shrinivas& K Sreelatha Reddy, Himalaya Publishers.
7. Financial Accounting: M.N Arora, Tax Mann Publications.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM I YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – II

BUSINESS LAWS

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Demonstrate, understand and communicate all the Legal Terminology of Business.
2. Understanding Development of Business Law in India.
3. Outline Essentials of a valid Contract and agreements expressly declared to be void.
4. Wagering Agreements from Contingent contracts and classify different modes of Discharge.
5. Acquire knowledge about Sale of Goods Act 1930 and Consumer Protection Act 1986.
6. Explain Intellectuals Property Rights , Information Technology Act & Environmental Protection Act.

Objective: To understand basics of contract act, sales of goods act, IPRs and legal provisions applicable for establishment, management and winding up of companies in India.

UNIT–I: INDIAN CONTRACT ACT: Agreement and contract - Essentials of a valid contract - Types of contracts - Offer and Acceptance - Essentials of valid offer and acceptance - Communication and revocation of offer and acceptance – Consideration definition - Essentials of valid consideration -Modes of Discharge of a contract - Performance of Contracts - Breach of Contract - Remedies for Breach - Significance of Information Technology Act.

UNIT–II: SALE OF GOODS ACT AND CONSUMER PROTECTION ACT: Contract of Sale: Essentials of Valid Sale - Sale and Agreement to Sell – Definition and Types of Goods - Conditions and Warranties - Caveat Emptor - Exceptions - - Unpaid Seller - Rights of Unpaid Seller. Consumer Protection Act 1986: Definitions of Consumer – Person – Goods - Service -Consumer Dispute - Consumer Protection Councils - Consumer Dispute Redressal Agencies - Appeals.

UNIT–III: INTELLECTUAL PROPERTY RIGHTS: Trade Marks: Definition - Registration of Trade Marks - Patents: Definition - Kinds of Patents - Transfer of the Patent Rights - Rights of the Patentee - Copy Rights: Definition -- Rights of the Copyright Owner - Terms of Copy Right - Copy Rights Infringement - Other Intellectual Property Rights: Trade Secrets - Geographical Indications.

UNIT–IV: MANAGEMENT OF COMPANIES AND MEETINGS: Director: Qualification - Disqualification - Position - Appointment - Removal – Duties and Liabilities – Loans – Remuneration – Managing Director – Corporate Social Responsibility – Corporate Governance. Meeting: Meaning – Requisites - Notice – Proxy - Agenda – Quorum – Resolutions – Minutes – Kinds – Shareholder Meetings - Statutory Meeting - Annual General Body Meeting – Extraordinary General Body Meeting – Board Meetings.

UNIT–V: WINDING UP: Meaning – Modes of Winding Up –Winding Up by tribunal – Voluntary Winding Up – Compulsory Winding Up – Consequences of Winding Up – Removal of name of the company from Registrar of Companies – Insolvency and Bankruptcy code - 2016.

SUGGESTED READINGS: 1) Company Law: ND Kapoor, Sultan Chand and Co.
2) Company Law: Rajashree. – HPH
3) Business Law - Kavitha Krishna, Himalaya Publishing House
4) Business Laws – Dr. B. K. Hussain, Nagalakshmi – PBP
5) Company Law: Prof. G. Krishna Murthy, G. Kavitha, PBP
6) Company Law and Practice: GK Kapoor& Sanjay Dhamija, Taxmann Publication.
7) Company Law: Revised as per Companies Act- 2013: KC Garg et al, Kalyani Publication.
8) Corporate Law: PPS Gogna, S Chand.
9) Business Law: D.S. Vital, S Chand 10) Company Law: Bagrial AK, Vikas Publishing House.

SEMESTER - III

(2020-2021)

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATION/TAX PROCEDURES & PRACTICE S)CBCS

SEMESTER – III SKILL ENHANCEMENT COURSE (SEC-2)

PRINCIPLES OF INSURANCE

Applicable from the academic year 2020-21onwards

MAX MARKS :50(40E+10I) **HPW :2** **NO. Of Credits:2**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Identify and categories the various risks faced by an organization & individuals.
2. Relate to the role of Insurance in economic development of society and social security.
3. Understand the basic terminology and Principles of Insurance.
4. Describe the difference between Life & Non –Life insurance Products.
5. Able to understand the various policies of Insurance.

Objectives: To make Students to learn Principles of Insurance.

UNIT I: RISK MANAGEMENT AND INSURANCE & INSURANCE TERMINOLOGY: Risk Management -Types of Risks - Actual and Consequential Losses - Management of Risks - Risk of Dying Early - Risk of Living too Long - Different Classes of Insurance - Importance of Insurance - Management of Risk by Individuals and Insurers - Fixing of Premiums – Reinsurance - Role of Insurance in Economic Development and Social Security - Constituents of Insurance Market - Operations of Insurance Companies - Operations of Intermediaries - Specialist Insurance Companies - Role of Regulators - Common and specific terms in Life and Non-Life Insurance - Understanding Insurance Customers - Customer Behavior at Purchase Point - Customer Behavior when Claim Occurs - Importance of Ethical Behavior

UNIT II: INSURANCE CONTRACT AND INSURANCE PRODUCTS: Insurance Contract Terms - Principles of Insurance: Principle of Insurable Interest, Principle of Indemnity, Principle of Subrogation, Principle of Contribution, Relevant Information Disclosure, Principle of utmost Good Faith, Relevance of Proximate Cause - Life Insurance Products: Term Plans - Pure Endowment Plans - Combinations of Plans - Traditional Products - Linked Policies - Features of Annuities and Group Policies - General Insurance Products: Risks faced by Owner of Assets - Exposure to Perils - Features of Products Covering Fire and Allied Perils - Products covering Marine and Transit Risks - Products covering Financial Losses due to Accidents - Products covering Financial Losses due to Hospitalization - Products Covering Miscellaneous Risks

SUGGESTED READINGS: 1. Principles of Risk Management and Insurance: George E Rejda (13th Edition) 2. Risk Management and Insurance: Trieschman ,Gustavson and Hoyt . South Western College Publishing, 3. Principles of Insurance: A Publication of the Insurance Institute of India 4. Principles of Insurance: Telugu Academy, Hyderabad 5. Guide to Risk Management: SagarSanyal6. Principles of Insurance: Dr V Padmavathi,Dr V Jayalakshmi - PBP 7. Insurance and Risk Management : P.K. Gupta 8. Insurance Theory and Practice :Tripathi PHI 9. Principles of Insurance Management: Neelam C Gulati, Excel Books 10. Life and Health Insurance: Black, JR KENNETH & Harold Skipper, Pearson, Cincinnati,Ohio Suggested Websites: 1) www.irda.gov.in 2) www.polocyholder.gov.in

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – III

ADVANCED ACCOUNTING

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Prepare financial accounts for partnership firms in different situations .
2. Prepare financial statements for partnership firm on dissolution of the firm.
3. Apply the New Companies Act provisions regarding Company accounts.
4. Evaluate the different ways for a company to raise finances from public .
5. Understand Profits prior to incorporation of a Company.
6. Understand the need and methods of valuation of shares and goodwill.

Objective: To acquire accounting knowledge of partnership firms and joint stock companies

UNIT-I: PARTNERSHIP ACCOUNTS-I: Meaning – Partnership Deed - Capital Accounts (Fixed and Fluctuating) – Admission of a Partner – Retirement and Death of a Partner (Excluding Joint Life Policy)(Including problems)

UNIT-II: PARTNERSHIP ACCOUNTS–II: Dissolution of Partnership – Insolvency of a Partner (excluding Insolvency of all partners) – Sale to a Company (Including problems)

UNIT-III: ISSUE OF SHARES, DEBENTURES, UNDERWRITING AND BONUS SHARES: Issue of Shares at par, premium and discount – Pro-rata allotment – Forfeiture and Re-issue of Shares – Issue of Debentures with Conditions of Redemption – Underwriting: Meaning – Conditions- Bonus Shares: Meaning – SEBI Guidelines for Issue of Bonus Shares – Accounting of Bonus Shares(Including problems)

UNIT-IV: COMPANY FINAL ACCOUNTS AND PROFIT PRIOR TO INCORPORATION: Companies Act 2013: Structure – General Instructions for preparation of Balance Sheet and Statement of Profit and Loss – Part-I: Form of Balance Sheet – Part-II: Statement of Profit and Loss – Preparation of Final Accounts of Companies - Profits Prior to Incorporation- Accounting treatment. (Including problems)

UNIT-V: VALUATION OF GOODWILL AND SHARES: Valuation of Goodwill: Need – Methods: Average Profits, Super Profits and Capitalization Methods -Valuation of Shares: Need –Net Assets, Yield and Fair Value Methods. (Including problems)

SUGGESTED READINGS: 1. Principles and Practice of Accounting: R.L. Gupta & V.K. Gupta,Sultan Chand & Sons. 2. Advanced Accountancy: Shukla and Grewal, S.Chand& Co. 3. Advanced Accountancy: R.L.Gupta&Radhaswamy, Sultan Chand & Sons. 4. Advanced Accountancy (Vol-II): S.N.Maheshwari&V.L.Maheswari, Vikas. 5. Advanced Accountancy: Dr. G. Yogeshwaran, Julia Allen - PBP 6. Accountancy–III: Tulasian, Tata McGraw Hill Co. 7. Advanced Accountancy: Arulanandam; Himalaya. 8. Accountancy–III: S.P. Jain & K.L Narang, Kalyani Publishers. 9. Guidance Note on the Revised Schedule VI to the Companies Act, 1956, The Institute of Chartered Accounts of India. 10. Advanced Accounting (IPCC): D. G. Sharma, Tax Mann Publications.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – III

BUSINESS STATISTICS –I

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **HPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Express the fundamentals of Statistics.
2. Understand basic statistical concepts such as statistical collection, statistical series, tabular and graphical representation of data.
3. Calculate measures of central tendency, dispersion and asymmetry
4. Interpret the meaning of the calculated statistical indicators.
5. Choose a statistical method for solving practical problems.
6. Predict values of strategic variables using regression and correlation analysis.

Objective: to inculcate analytical and computational ability among the students.

UNIT-I: INTRODUCTION: Origin and Development of Statistics – Definition - Importance and Scope - Limitations of Statistics - Distrust of Statistics. Statistical Investigation: Planning of statistical investigation - Census and Sampling methods - Collection of primary and secondary data - Statistical errors and approximation - classification and Tabulation of data - Frequency distribution.

UNIT – II: DIAGRAMMATIC AND GRAPHIC PRESENTATION: Diagrammatic presentation: One Dimensional and Two Dimensional Diagrams – Pictograms – Cartograms Graphic presentation: Technique of Construction of Graphs - Graphs of Frequency Distribution - Graphs of Time Series or Histograms.

UNIT-III: MEASURES OF CENTRAL TENDENCY: Introduction –Significance -Arithmetic Mean- Geometric Mean - Harmonic Mean - Mode – Median - Quartiles and Percentiles - Simple and Weighted Averages - Uses and Limitations of different Averages.

UNIT-IV: MEASURES OF DISPERSION, SKEWNESS AND KURTOSIS: Measures of Dispersion: Significance - Characteristics - Absolute and Relative Measures - Range - Quartile Deviation - Mean Deviation- Standard Deviation - Coefficient of Variation. Measures of Skewness - Karl Pearson's Coefficient of Skewness - Bowley's Coefficient of Skewness - Kelly's Measure of Skewness – Kurtosis: Mesokurtosis, Platy kurtosis and Leptokurtosis.

UNIT-V: CORRELATION: Meaning -Types - Correlation and Causation – Methods: Scatter Diagram - Karl Person's Coefficient of Correlation - Probable Error and Interpretation of Coefficient of Correlation - Rank Correlation - Concurrent Deviation Method.

SUGGESTED READINGS: 1. Statistics for Management: Levin & Rubin, Pearson 2. Fundamentals of Statistics: Gupta S.C, Himalaya 3. Statistics: E. Narayanan Nadar, PHI Learning 4. Business Statstics –I: Dr. Obul Reddy, Dr. D. Shridevi - PBP 5. Business Statistics: Dr. J. K. Thukral, Taxmann Publications 6. Business Statistics: K. Alagar, Tata McGraw Hill 7. Fundamentals of Statistical: S. P Gupta, Sultan Chand 8. Business Statistics: J. K. Sharma, Vikas Publishers.

COMPUTER APPLICATION

SEMESTER - IV

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – IV SKILL ENHANCEMENT COURSE (SEC-4)

PRACTICE OF LIFE AND GENERAL INSURANCE

Applicable from the academic year 2020-21 onwards

MAX MARKS :50 **PPW : 2** **NO. Of Credits:2**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Analyse the growth of insurance business in India.
2. Explain the Organizational structure of LIC & various types of Policies.
3. Understand the meaning of various insurance policies offered to Organizations.
4. Apply the meaning of assignment & Nomination.
5. Describe about Policy claim procedure.
6. Evaluate survival benefits & various kinds of claims.

Objective: To make students to learn Practice of Life and General Insurance

UNIT-I: PREMIUM CALCULATION AND POLICY DOCUMENTS: Meaning of Premium, its calculation- Rebates – Mode of Rebates – Large sum assured Rebates – Premium Loading – Rider Premiums – Computation of Benefits – Surrender value – Paid up value -General Insurance Policy Documents and Forms - Rating and Premiums - concept of soft and hard markets

UNIT-II: SETTLEMENT OF CLAIMS RISK & UNDERWRITTINGS AND FINANCIAL PLANNING & TAX SAVING: Life Insurance: Settlement of claims: Intimation Procedure, documents and settlement procedures - Underwriting: The need for underwriting – Guiding principles of Underwriting – Factors affecting Insurability – Methods of Life Classification – Laws affecting Underwriting - Financial Planning and taxation: Savings – Insurance vis-à-vis-Investment in the Units Mutual Funds, Capital Markets – Life Insurance in Individual Financial Planning – Implications in IT treatment. General Insurance: Concept of Underwriting—Underwriting Process—Risk sharing and its methods—risk management and steps involved in it——Concept of Claim-understanding the process of claim management—claims fraud and fraud prevention—Insurance reserves and accounting—different types of reserves of insurance companies—reserving process followed by insurance companies—Insurance accounting.

SUGGESTED READINGS: 1. Practice of Life Insurance&General Insurance: Insurance Institute of India, Mumbai. 2. Insurance and Risk Management: P.K.Gupta, Himalaya Publishing House, Mumbai. 3. Fundamentals of Life Insurance Theories and Applications: Kanika Mishra, Prentice Hall 4. Principles of Life Insurance & Practice of General Insurance– Dr. V. Padmavathi, Dr. V. Jayalakshmi - PBP 5. Managing Life Insurance: Kutty, S.K., Prentice Hall of India: New Delhi 6. Life and Health Insurance: Black, Jr. Kenneth and Harold Skipper Jr., Prentice Hall, Inc., England. 7. Life Insurance: Principles and Practice: K.C. Mishra and C.S. Kumar, Cengage Learning, New Delhi. 8. Life Insurance in India: Sadhak, Respose Books, New Delhi. 9. Practice of General Insurance – D.S. Vittal-HPH, 10.Principles & Practice of Insurance- Dr. P. Periasamy – HPH. 11. Risk Management: A Publication of the Insurance Institute of India. 12.Insurance Theory and Practice: Tripathi PHI 13. Risk Management and Insurance: Trieschman, Gustavson and Hoyt 9. South Western College Publishing Cincinnati, Ohio.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – IV

INCOME TAX

Applicable from the academic year 2020-21onwards

MAX MARKS : 60 E+40I=100 **HPW : 5** **NO. Of Credits: 5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire the complete knowledge of basic concepts of income tax
2. Illustrate the concept of exempted incomes.
3. Calculate Residential status of a person.
4. Compute the income under the head" Income from Salary"
5. Compute income under the head "Income from House Property"
6. Compute income under the head "Income from Business or Profession"
7. Apply the conceptual and legal knowledge about Income Tax provisions .
8. Computation of Income from different heads with reference to an Individual Assessee.
9. Identify intra and inter head set of losses and carry forward of losses.
10. Understand clubbing of income and the term aggregation of income.
11. Identify various deductions under section u/s80 C to 80 U 6. Assessing income, calculate tax liability and file E-returns.

Objective: To acquire conceptual and legal knowledge about Income Tax provisions relating to computation of Income from different heads with reference to an Individual Assessee.

UNIT–I: INTRODUCTION: Direct and Indirect Taxes – Canons of Taxation - Features and History of Income Tax in India – Definitions and Basic Concepts of Income Tax: Assessee – Deemed Assessee – Assessee-in-default – Assessment Year – Previous Year - Person – Agricultural Income – Heads of Income – Gross Total Income – Total Income –– Incomes Exempt from Tax. Residential Status and Scope of Total Income: Meaning of Residential Status – Conditions applicable to an Individual Assessee – Incidence of Tax – Types of Incomes. (Theory only)

UNIT–II: INCOME FROM SALARIES: Definition of 'Salary' – Characteristics of Salary – Computation of Salary Income: Salary u/s 17(1) – Annual Accretion – Allowances – Perquisites – Profits in lieu of Salary – Deductions u/s. 16 – Problems on computation of Income from Salary.

UNIT–III: INCOME FROM HOUSE PROPERTY: Definition of 'House Property' – Exempted House Property incomes– Annual Value – Determination of Annual Value for Let-out House and Self-occupied House – Deductions u/s.24 – Problems on computation of Income from House Property.

UNIT–IV: PROFITS AND GAINS OF BUSINESS OR PROFESSION: Definition of 'Business and Profession' – Procedure for computation of Income from Business – Revenue and Capital nature of Incomes and Expenses – Allowable Expenses u/s. 30 to 37 – Expenses expressly disallowed – Deemed Profits – Miscellaneous provisions u/s 44. Depreciation: Meaning – Conditions for charge of depreciation – Problems on computation of Income from Business.Income from Profession: Rules– procedure – problems on computation of Income from Profession.

UNIT-V: CAPITAL GAINS AND INCOME FROM OTHER SOURCES: Introduction - Meaning – Scope of charge – Basis of charge – Short term and Long term Capital Assets – Transfer of Capital Asset – Deemed Transfer –Determination of Cost of Acquisition – Procedure for computation of Long-term and Short-term Capital Gains/Losses – Exemptions in respect of certain Capital Gains u/s. 54 – Problems on computation of capital gains - General Incomes u/s. 56(1) – Specific Incomes u/s. 56(2) – Dividends u/s. 2(22) – Winnings from lotteries Puzzles, crown world puzzles, Races – Interest on Securities – Gifts received by an Individual – Casual Income – Family Pension – Rent received on let out of Furniture- Plant and Machinery with/without Building – Deductions u/s. 57. (Theory only)

SUGGESTED READINGS: 1. Income Tax Law and Practice: V.P. Gaur & D.B Narang, Kalyani Publishers. 2. Taxation: Dr. M.N. Ravi, PBP. 3. Direct Taxes Law & Practice: Dr.Vinod K. Singhania&Dr.KapilSinghania, Taxmann 4. Income Tax: B.B. Lal, Pearson Education. 5. Taxation: R.G. Saha, Himalaya Publishing House Pvt. Ltd. 6. Income Tax: Johar, McGrawHill Education. 7. Taxation Law and Practice: Balachandran&Thothadri, PHI Learning. 8. Direct Tax Law and Practice : AhujaGirish

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM II YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – IV

BUSINESS STATISTICS – II

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **PPW :** 5 **NO. Of Credits:** 5

COURSE OUTCOMES

After completion of the course the student is able to:

1. Describe the various techniques of Advanced Statistics in the field of commerce.
2. Select appropriate statistical techniques for summarizing and displaying business data.
3. Analyze and draw inferences from business data using appropriate statistical methods.
4. Interpret and communicate the results of a statistical analysis in the context of a business problem.
5. Understand and use simple forecasting techniques.
6. Understand the concept of Index Numbers , Probability and theoretical distribution.

Objective: To inculcate analytical and computational ability among the students.

UNIT-I: REGRESSION: Introduction - Linear and Non Linear Regression – Correlation Vs. Regression - Lines of Regression - Derivation of Line of Regression of Y on X - Line of Regression of X on Y - Using Regression Lines for Prediction.

UNIT-II: INDEX NUMBERS: Introduction - Uses - Types - Problems in the Construction of Index Numbers - Methods of Constructing Index Numbers - Simple and Weighted Index Number (Laspeyre - Paasche, Marshall – Edgeworth) - Tests of Consistency of Index Number: Unit Test - Time Reversal Test - Factor Reversal Test - Circular Test - Base Shifting - Splicing and Deflating of Index Numbers.

UNIT-III: TIME SERIES: Introduction - Components – Methods-Semi Averages - Moving Averages – Least Square Method - Deseasonalisation of Data – Uses and Limitations of Time Series.

UNIT-IV: PROBABILITY: Probability – Meaning - Experiment – Event - Mutually Exclusive Events - Collectively Exhaustive Events - Independent Events - Simple and Compound Events - Basics of Set Theory – Permutation – Combination - Approaches to Probability: Classical – Empirical – Subjective - Axiomatic - Theorems of Probability: Addition – Multiplication - Baye's Theorem.

UNIT-V: THEORITECAL DISTRIBUTIONS: Binomial Distribution: Importance – Conditions – Constants - Fitting of Binomial Distribution. Poisson Distribution: – Importance – Conditions – Constants - Fitting of Poisson Distribution. Normal Distribution: – Importance - Central Limit Theorem - Characteristics – Fitting a Normal Distribution (Areas Method Only).

SUGGESTED READINGS: 1. Statistics for Management: Levin & Rubin, Pearson, 2. Fundamentals of Statistics: Gupta S.C, Himalaya 3. Business Statistics: Theory & Application, P. N. Jani, PHI Learning 4. Business Statics – II: Dr. OBul Reddy, Dr. D. Shridevi - PBP 5. Business Statistics: Dr. J. K. Thukral, Taxmann Publications 6. Business Statistics: K. Alagar, Tata McGraw Hill 7. Fundamentals of Statistical: S. P Gupta , Sultan Chand 8. Business Statistics: J. K. Sharma,Vikas Publishers 9. Business Statistics: Vora, Tata McGraw Hill 10. Statistics-Problems and Solutions: Kapoor V.K, S. Chand 11. Statistics-Teory, Methods and Applications: SanchetiD.C. &Kapoor V.K 12. Business Statistics: S. K. Chakravarty, New Age International Publishers 13. Business Statistics-G.Laxman,Vasudeva Reddy, K.Goud, TaxmannPublications,Hyderabad.

COMPUTER APPLICATION

SEMESTER - V

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – V

COST ACCOUNTING

Applicable from the academic year 2020-21onwards

MAX MARKS : 60 E+40I=100 **HPW :5** **NO. Of Credits:5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Imbibe conceptual knowledge of cost accounting.
2. Select the costs according to their impact on business.
3. Differentiate methods of schedule costs per unit of production and calculating stock consumption.
4. Identify the specifics of different costing methods and interpret the impact of the selected costs method.
5. Apply cost accounting methods to evaluate and project business performance.
6. Demonstrate mastery of costing systems, cost management systems, budgeting systems and performance measurement system.

Objective: To make the students acquire the knowledge of cost accounting methods.

UNIT-I: INTRODUCTION: Cost Accounting: Definition – Features – Objectives – Functions – Scope – Advantages and Limitations - Essentials of a good cost accounting system- Difference between Cost Accounting and Financial Accounting – Cost concepts – Cost Classification.

UNIT-II: MATERIAL: Direct and Indirect Material cost – Inventory Control Techniques – Stock Levels – EOQ – ABC Analysis – JIT - VED - FSND - Issue of Materials to Production – Pricing methods: FIFO - LIFO with Base Stock and Simple and Weighted Average methods.

UNIT-III: LABOUR AND OVERHEADS: Labour: Direct and Indirect Labour Cost – Methods of Payment of Wages (only Incentive Plans): Halsey, Rowan, Taylor Piece Rate and Merrick Multiple Piece Rate Methods. Overheads: Classification - Methods of Allocation - Apportionment and Absorption of overheads.

UNIT-IV: UNIT AND JOB COSTING: Unit Costing: Features - Cost Sheet – Tender and Estimated Cost Sheet. Job Costing: Features - Objectives – Procedure - Preparation of Job Cost Sheet.

UNIT-V: CONTRACT AND PROCESS COSTING: Contract Costing: Features – Advantages - Procedure of Contract Costing – Guidelines to Assess profit on incomplete Contracts. Process Costing: Meaning – Features – Preparation of Process Account – Normal and Abnormal Losses.

SUGGESTED READINGS: 1. Cost Accounting: Jain and Narang, Kalyani 2. Cost Accounting: Srihari Krishna Rao, Himalaya 3. Cost and Management Accounting: PrashantaAthma, Himalaya 4. Cost Accounting: Dr. G. Yogeshweran, PBP. 4. Cost Accounting: Jawaharlal, Tata Mcgraw Hill 5. Cost Accounting: Theory and Practice: Banerjee, PHI 6. Introduction to Cost Accounting: Tulsian, S.Chand 7. Cost Accounting: Horngren, Pearson 8. Cost Accounting: Ravi M. Kishore, Tax Mann Publications.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – V

COMPUTERIZED ACCOUNTING

Applicable from the academic year 2020-21 onwards

MAX MARKS : 50 E+35P+15I=100 **PPW :3T+4P** **NO. Of Credits:5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Acquire the knowledge of computer software.
2. Understand the limitations of manual accounting and advantages of computerized accounting.
3. Integrate technical skills with financial accounting procedures.
4. Explain the process of maintaining inventory and day-to-day transactions in Tally accounting software.
5. Manage account receivables and payables in ERP.
6. Able to generate MIS reports.

Objective: To make the students to acquire the knowledge of computer software

UNIT I: MAINTAINING CHART OF ACCOUNTS IN ERP: Introduction-Getting Started with ERP - Mouse/Keyboard Conventions-Company Creation-Shut a Company-Select a Company-Alter Company Details-Company Features and ConfigurationsF11: Company Features-F12: Configuration-Chart of Accounts-Ledger-Group-Ledger CreationSingle Ledger Creation-Multi Ledger Creation-Altering and Displaying Ledgers-Group Creation-Single Group Creation-Multiple Group Creation-Displaying Groups and LedgersDisplaying Groups-Display of Ledgers-Deletion of Groups and Ledgers – P2P procure to page. **UNIT II: MAINTAINING STOCK KEEPING UNITS (SKU):** Introduction-Inventory Masters in ERP - Creating Inventory Masters-Creation of Stock GroupCreation of Units of Measure-Creation of Stock Item-Creation of Godown-Defining of Stock Opening Balance in ERP Stock Category-Reports.

UNIT III: RECORDING DAY-TO-DAY TRANSACTIONS IN ERP: Introduction-Business Transactions-Source Document for Voucher-Recording Transactions in ERP - Accounting Vouchers-Receipt Voucher (F6)-Contra Voucher (F4)-Payment Voucher (F5)-Purchase Voucher (F9)-Sales Voucher (F8)-Debit Note Voucher-Credit Note (Ctrl+F8)- Journal Voucher (F7).

UNIT IV: ACCOUNTS RECEIVABLE AND PAYABLE MANAGEMENT: Introduction-Accounts Payables and Receivables-Maintaining Bill-wise Details-Activation of Maintain Bill-wise Details Feature-New Reference-Against Reference-Advance-On AccountStock Category Report-Changing the Financial Year in ERP.

UNIT V: MIS REPORTS: Introduction-Advantages of Management Information Systems-MIS Reports in ERP - Trial Balance - Balance Sheet-Profit and Loss Account-Cash Flow Statement-Ratio Analysis-Books and Reports - Day Book-Receipts and Payments-Purchase Register-Sales Register-Bills Receivable and Bills Payable.

SUGGESTED READINGS: 1. Computerised Accounting: GarimaAgarwal, Himalaya 2. Computerised Accounting: A. Murali Krishna, Vaagdevi publications 3. Computerised Accounting: Dr. G. Yogeshweran, PBP. 4. Aakash Business Tools: Spoken Tutorial Project IIT Bombay 5. Mastering Tally: Dinesh Maidasani, Firewal Media 6. Implementing Tally ERP 9: A.K Nadhani and K.K Nadhani, BPB Publications 7. Computerised Accounting and Business Systems: Kalyani Publications 8. Manuals of Respective Accounting Packages 9. Tally ERP 9: J.S. Arora, Kalyani Publications.

COMPUTER APPLICATION

SEMESTER - VI

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – VI

PR : RESEARCH METHODOLOGY & PROJECT REPORT

Applicable from the academic year 2020-21 onwards

MAX MARKS : 50 T + (35R + 15V=50 P) =100 marks HPW : 2T+4R NO. Of Credits:4

COURSE OUTCOMES

After completion of the course the student is able to:

1. understand some basic concepts of research and its methodologies .
2. identify appropriate research topics.
3. select and define appropriate research problem and parameters.
4. prepare a project proposal (to undertake a project).
5. organize and conduct research (advanced project) in a more appropriate manner.
6. write a research report and thesis.
7. write a research proposal (grants)

Objective: To introduce the basics of conducting research in social sciences.

UNIT-I: INTRODUCTION, MEASUREMENT AND HYPOTHESIS TESTING: Meaning of Research-Steps involved-Identification of Problem- Steps involved in the selection of problem-Research Design-Meaning and Types-Measurement Levels/Scales - Scaling Techniques-Hypothesis-Meaning - Types – Testing Procedure.

UNIT-II:PARAMETRIC AND NON PARAMETRIC TESTS AND RESEARCH REPORT: Introduction - t-Test - F-Test - Chi Square Test - Anova (One-Way Anova, Two-Way Anova).concepts only Contents of a Research Report.

SUGGESTED READINGS: 1. Research Methodology: Himalaya Publications. 2. Methodology of Research in Social Sciences: Krishna Swamy, 3. Research Methodology: Kothari &Garg, New Age Publication 4. Research Methodology: Paneerselvam R, PHI 5. Research Methodology: Dr Vijay Upagade& Dr ArvindShende, S. Chand Publications 6. Research Methodology: Ranjit Kumar, Pearson Publication 7. Reading in Research Methodology in Commerce & Business Management: Achalapathi KV, 8. Research Methodology: Sashi.K Gupta, PraneethRangi, Kalyani Publishers.

GUIDELINES FOR PROJECT WORK

1) Project work is a part of the prescribed curriculum to B. Com students. 2) Project work is allotted to a group of 4 students. 3) During the IV semester, students are expected to undergo internship at a business firm/ Government Department /Software organization/Voluntary organization as per the guidance of teacher concerned. 4) Students should get a certificate from the organization. 5) At the end of Semester-VI, the project reports would be evaluated by the external examiner designated by the Controller of Examinations, from the panel submitted by the Board of Studies in Commerce. The Examiner would evaluate the project reports for a maximum of 35 marks and conduct Viva-Voce examination for 15 marks. The award lists duly signed would be sent the Controller of Examinations. 6) Examiners will examine the following in the project report: i) Survey/Analysis on the topic chosen; ii) Method of data collection; iii) Presentation: Style, Comprehensiveness, graphs, charts etc.; iv) Analysis and inference and implications of the study; v) Bibliography. 7) Students must ensure that they maintain regular contact with their supervisor and also that they provide the supervisor with drafts of their work at regular intervals. 8) Students are required to submit a project report on a topic related/connected with trade, industry & commerce. Project can be done by taking the information from the select organization focusing on areas like marketing, finance, human resource, operations, general management etc. Faculty of Commerce OU 34 9) Project should be a practical, in-depth study of a problem, issue, opportunity, technique or procedure or some combination of these aspects of business. The Students are required to define an area of investigation, assemble relevant data, analyse the data, draw conclusions and make recommendations.

ORGANISATION OF PROJECT REPORT

Project report should be presented in the following sequence: i) Title page; ii) Student's declaration; iii) Supervisor's certificate; iv) Internship certificate; v) Abstract; vi) Acknowledgements; vii) Table of contents; viii) List of tables; ix) List of figures; x) List of appendices. 2) Chapter Design should be as follows:

Chapter-I: Introduction: this chapter includes the research problem, need for study/significance of the project, objectives, methodology (hypotheses, statistical tools, data source, scope, sample, chapter design).

Chapter-II:Company Profile: this chapter should contain a brief historical retrospect about the entity of your study.

Chapter-III: Data Analysis and interpretation: this chapter should present the data analysis and inferences.

Chapter-IV: Summary and Conclusions: This Chapter should give an overview of the project, conclusions, implications, recommendations and scope for further research. Bibliography: lists the books, articles, and websites that are referred and used for research on the topic of the specific project. Follow Harvard style of referencing. Appendices: the data, used to prepare the tables for analysis, may not be feasible to incorporate as part of chapters, may given as appendices.

TECHNICAL SPECIFICATIONS OF THE PROJECT

1) Project should be typed on A4 white paper, and be 1.5 spaced.

2) All pages should be numbered, and numbers should be placed at the centre of the bottom of the page.

3) All tables, figures and appendices should be consecutively numbered or lettered, and suitably labeled.

4) 3 bound copies&a soft-copy should be handed in to the principal/director of your college/institute at the time of submission.

5) bibliography and referencing: Referencing is necessary to avoid plagiarism, to verify quotations and to enable readers to follow-up and read more fully the cited author's arguments. Reference is given within the text of the project as well as at the end of the project. The basic difference between citation and a reference list (bibliography) is that the latter contains full details of all the in-text citations. Citation provides brief details of the author and date of publication for referencing the• work in the body of the text. Reference list is given at the end of the text and is a list of all references used with• additional details provided to help identify each source. Proper referencing is as crucial aspect of your project. You are therefore strongly advised to talk to your supervisor about this, in order to make sure that your project report follows the appropriate referencing system.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – VI

COST CONTROL AND MANAGEMENT ACCOUNTING

Applicable from the academic year 2020-21 onwards

MAX MARKS : 60 E+40I=100 **PPW : 5** **NO. Of Credits: 5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Understand various costing systems and management systems.
2. Analyse and provide recommendations to improve the operations of organisations through the application of Cost and Management accounting techniques.
3. Evaluate the costs and benefits of different conventional and contemporary costing systems.
4. Differentiate methods of schedule costs as per unit of production.
5. • Differentiate methods of calculating stock consumption.
6. Identify the specifics of different costing methods.
7. Analyze cost-volume-profit techniques to determine optimal managerial decisions.
8. Apply cost accounting methods for both manufacturing and service industry.

Objective: Tobe acquaint with Cost Control techniques, Managerial Accounting decision-making techniques and reporting methods.

UNIT-I: INTRODUCTION TO MANAGEMENT ACCOUNTING &MARGINAL COSTING: Meaning and Importance of Management Accounting – Marginal Cost Equation – Difference between Marginal Costing and Absorption Costing – Application of Marginal Costing – CVP Analysis – Break Even Analysis: Meaning – Assumptions – Importance - Limitations. Marginal Costing for Decision Making-Make or Buy – Add or Drop Products – Sell or Process Further – Operate or Shut-down – Special Order Pricing – Replace or Retain.

UNIT-II: BUDGETARY CONTROL AND STANDARD COSTING: Budget: Meaning – Objectives – Advantages and Limitations – Essentials of Budgets - Budgetary Control - Classification of Budgets - Preparation of Fixed and Flexible Budgets. Standard Costing: Meaning – Importance – Standard Costing and Historical Costing - Steps involved in Standard Costing. Variance Analysis: Material variance - Labour variance - Overhead variance .

UNIT-III: TECHNIQUES OF FINANICAL STATEMENT ANALYSIS: Meaning – Objectives - Techniques: Comparative Statement, Common Size Statement, Trend Analysis. Ratios- Meaning , Objectives and Classification—Computation of Activity, Liquidity, Solvency and Profitability Ratios.

UNIT-IV: FUNDS FLOW ANANLYSIS: Concept of Funds – Meaning and Importance – Limitations – Statement of Changes in Working Capital – Statement of Sources and Application of Funds.

UNIT-V: CASH FLOW ANALYSIS (AS-3): Meaning – Importance – Differences between Funds Flow and Cash Flow Statements – Procedure for preparation of Cash Flow Statement.

SUGGESTED READINGS: 1. Management Accounting- Principles & Practice: Sharma RK &Shashi K. Gupta, Kalyani 2. Advanced Managerial Accounting: Srihari Krishna Rao, Himalaya 3. Advanced Managerial Accounting: Dr. Sundaram, PBP 3. Advanced Management Accounting: Robert S. Kaplan & Anthony A. Atkinson, Prentice-Hall 4. Management Accounting: Rustagi R.P, Galgotia 5. Managerial Accounting: Ronald W. Hilton, TM

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF COMMERCE

B.COM III YEAR (COMPUTER APPLICATIONS/TAX PROCEDURES & PRACTICE)CBCS

SEMESTER – VI

THEORY AND PRACTICE OF GST

Applicable from the academic year 2020-21 onwards

MAX MARKS : 50 E+35P+15I=100 **PPW :3T+4P** **NO. Of Credits:5**

COURSE OUTCOMES

After completion of the course the student is able to:

1 . Know the various provisions of GST Act 2017.
2. Practice various provisions of GST in Tally ERP 9.1.
3. Learn and compare various tax rates for goods and services under GST .
4. Practice the advance entries and adjustments relating to various transactions.
5. Generate the various reports and upload in the GST portal .

Objective: To equip the students with the knowledge regarding Theory and Practice of GST.

UNIT I: INTRODUCTION TO GST: Introduction – GST - Taxes Subsumed under GST -Determination of Tax - Registration -Process of Registration - Cancellation and renovation of registration - Supply of Goods and Services - Transition to GST - Registered Business -Availed Input Tax Credit -Unavailed CENVAT credit and Input VAT on capital goods-Availing the input credit held in closing stock -Invoicing -Tax Invoice -Bill of Supply - Credit Note, Debit Note and Supplementary Invoice-Transportation of goods without issue of Invoice - Input Credit Mechanism - Input Tax - GST Returns - Payment of Tax.

UNIT II: GETTING STARTED WITH GST: Introduction - Enabling GST and Defining Tax Details-Transferring Input Tax credit to GST -Intrastate Supply of Goods-Intrastate Inward Supply -Intrastate Outward Supply -Interstate - Interstate Outward Supply - Return of Goods -Purchase Returns -Sales Returns -Supplies Inclusive of Tax -Defining Tax Rates at Master and Transaction Levels - Defining GST Rates at Stock Group Level-Defining GST Rate at Transaction Level -Hierarchy of Applying Tax Rate Details –Reports.

UNIT III: RECORDING ADVANCED ENTRIES, GST ADJUSTMENT AND RETURN FILING: Introduction -Accounting of GST Transactions -Purchases from Composition Dealer -Purchases from Unregistered Dealers-Exports -Imports - Exempted Goods -SEZ Sales -Advance Receipts and payments - Mixed Supply and Composite Supply under GST - Mixed Supply of Goods -Composite Supply of Goods -GST Reports - Generating GSTR- Report in ERP -Input Tax Credit Set Off -GST Tax Payment -Time line for payment of GST tax -Modes of Payment -Challan Reconciliation - Exporting GSTR- return and uploading in GST portal. **UNIT IV: GETTING STARTED WITH GST (SERVICES):** Introduction -Determination of supply of services -Determining the Place of Supply of Services -Enabling GST and Defining Tax Details-Transferring Input Tax credit to GST -Intrastate Supply of Goods - Intrastate Inward Supply- Intrastate Outward Supply -Interstate Supply -Interstate Outward Supply - Interstate Inward Supply -Interstate Outward Supply of Services -Cancellation of Services -Cancellation of Inward Supplies -Cancellation of Outward Supply of Services -Defining Tax Rates at Master and Transaction Levels.

UNIT V: RECORDING ADVANCED ENTRIES AND MIGRATION TO ERP: Introduction - Accounting Multiple Services in a Single Supply - Recording Partial Payment to Suppliers -Outward Supplies - Recording Outward Supply with Additional Expenses - Supply of services -Business to consumers - Time of Supply of Services - Place of Supply of Services - Determining place of supply of services - Exempt Supply of Services under GST -Export Supply of Services - Reverse Charge on Services under GST - Advance Receipts from Customers under GST - Advance Receipt and issuing Invoice on same month -Advance Receipt and issuing Invoice on different month - Reversal of GST on account of cancellation of advance receipt - Generating GSTR- Report in ERP - Input Tax Credit Set Off - Migration to ERP - Activate Goods and Services Tax (GST) in ERP - Set up GST rates - Update Masters - Update party GSTIN/UIN - Creation of GST Duty ledgers.

SUGGESTED READINGS: 1. Taxmann's Basics of GST 2. Taxmann's GST: A practical Approach 3. Theory & Practice of GST, Srivathsala, HPH 4. Theory & Practice of GST: Dr. Ravi M.N, PBP

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET

(AUTONOMOUS)

CHOICE BASED CREDIT SYSTEM

(CBCS)

SYLLABUS
For
B.Sc

Under Graduate Programme

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME OUTCOMES:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAMME SPECIFIC OUTCOMES

1. Ability to apply the knowledge gained during the course of the program from Mathematics, Basic Computing, Basic Sciences and Social Sciences in general and all computer science courses in particular to identify, formulate and solve real life complex engineering problems faced in industries and/or during research work with due consideration for the public health and safety, in the context of cultural, societal, and environmental situations.
2. Ability to provide socially acceptable technical solutions to complex computer science engineering problems with the application of modern and appropriate techniques for sustainable development relevant to professional engineering practice.
3. Ability to apply the knowledge of ethical and management principles required to work in a team as well as to lead a team. Ability to comprehend and write effective project reports in multidisciplinary environment in the context of changing technologies.

Syllabus for Computer Science

Proposed scheme for **B.Sc.** Programme under **Choice Based Credit System**

Code	Course Title	Course Type	HpW	Credits
	SEMESTER – I			
BS106	Programming in C	DSC–3A	4T+3P=7	4 + 1 =5
	SEMESTER – II			
BS206	Programming in C++	DSC–3B	4T+3P=7	4 + 1 =5
	SEMESTER – III			
BS301	Python-I	SEC–1	2T	2
BS306	Data Structures			
	SEMESTER – IV			
BS401	Python-II	SEC–2	2T	2
BS406	Database Management Systems	DSC–3D	4T+3P=7	4 + 1 =5
	SEMESTER – V			
BS501	Information Technologies –1	GE–1	2	2
BS502	E: Python – 1	SEC–3	2	2
	F: Computer Organization			
BS505	Programming in Java	DSC–3E	3T+2P=5	3 + 1 =4
BS506	Elective–A: Operating Systems	DSE–1E	3T+2P=5	3 + 1 =4
	Elective–B: Software Engineering	DSE–2E		
	SEMESTER – VI			
BS601	Information Technologies –2	GE–2	2T	2
BS602	G: Python – 2	SEC–4	2T	2
	H: Information Security			
BS605	Computer Networks	DSC–3F	3T+2P=5	3 + 1 =4
BS606	Elective–A: PHP with MySQL	DSE–1F	3T+2P=5	3 + 1 =4
	Elective–B: Web Technologies	DSE–2F		
		Total Number of Credits		**48**

Government Degree College for Women Begumpet, Hyderabad-500016

(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.SC I Year Examination
Semester – I
Subject: Computer Science
Paper- I–Programming in C

Theory **4 Hours/Week** **4 credits**

Course Outcomes:

1. Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
2. Demonstrate an understanding of computer programming language concepts. To be able to develop C programs on linux platform.
3. Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
4. Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures.
5. Student must be able to define union and enumeration user defined data types. Develop confidence for self education and ability for life-long learning needed for Computer language.

SYLLABUS

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS.
Program Fundamentals: Generation and Classification of Programming Languages, Writing First C Program.
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,
Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One and Two Dimensional Arrays, Character Arrays, Functions from ctype.h, string.h.

Unit – III

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.

Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Dynamic Memory Allocation.

Unit – IV

User-Defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Structures verses Unions, Enumeration Types.

Files: Introduction, UsingFiles, Working with Text Files and Binary Files, File Management Functions.

Text

Pradip Dey, Manas Ghosh, Computer Fundamentals and Programming in C (2e)

References

1. Ivor Horton, Beginning C
2. Herbert Schildt, The Complete Reference C
3. Paul Deitel, Harvey Deitel, C How To Program
4. Byron S. Gottfried, Theory and Problems of Programming with C
5. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language

Government Degree College for Women Begumpet, Hyderabad-500016

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Re-Accredited by NAAC with 'B+' Grade
B.SC I Year Examination
Semester – I
Subject: Computer Science
Paper- I–Programming in C

Credit :1

Course Outcomes:

1. Know concepts in problem solving ·
2. To do programming in C language ·
3. To write diversified solutions using C language

C PRACTICAL QUESTION BANK

1. Write a program to find the largest two numbers using if and conditional operator.
2. Write a program to calculate arithmetic operations of two numbers using switch.
3. Write a program to print the reverse of a given number.
4. Write a program to print whether the given number is a prime or not.
5. Write a program to find largest and smallest elements in a given list of numbers.
6. Write a program to find the sum of two matrices.
7. Write a program to find the product of two matrices.
8. Write a program to print the reverse of a given string.
9. Write a program to find the factorial of a positive integer using iteration and recursion.
10. Write a program to find the GCD of two positive integers using iteration and recursion.
11. Write a program to demonstrate the call by value and the call by reference concepts.
12. Write a program to illustrate the use of Enumeration data type.
13. Write a program to illustrate the use of structure concept.
14. Write a program to illustrate the use of union concept.
15. Write a program to write content into a file and display contents of a file
16. Write a program to copy content of one file into another file and display the content of new file.

Note

Write the Pseudo Code and draw Flow Chart for the above programs.

Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows 10.

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Re-Accredited by NAAC with 'B+' Grade
B.SC I Year Examination
Semester – II
Subject: Computer Science

Theory	**4 Hours/Week**	**4credits**
Practical	**3Hours/Week**	**1 credit**

Course Outcomes:

1. To understand how C++ improves C with object-oriented features.
2. To learn how to write inline functions for efficiency and performance.
3. To learn the syntax and semantics of the C++ programming language.
4. To learn how to design C++ classes for code reuse.
5. To learn how to implement copy constructors and class member functions.
6. To understand the concept of data abstraction and encapsulation.
7. To learn how to overload functions and operators in C++.
8. To learn how containment and inheritance promote code reuse in C++.
9. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
10. To learn how to design and implement generic classes with C++ templates.
11. To learn how to use exception handling in C++ programs.

SYLLABUS

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers.

Functions: Introduction, Prototype, Passing Data by Value, Passing data by reference, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.

Object Oriented Programming: Procedural Programming verses Object-Oriented Programming, Benefits, OOP Languages, and OOP Applications.

Unit – II

Classes: Introduction, Defining an Instance of a Class, Private Members, Class Specification, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friend function, Copy Constructors, Operator Overloading, Aggregation.

Unit – III

Inheritance: Introduction, Access Specifiers, Base Class ,Derived Class, Types of Inheritance Constructors and Destructors in Base and Derived Classes, Polymorphism,Virtual Member Functions, Abstract Base Classes , Pure Virtual Functions, Multiple Inheritance.

C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Re-throwing an Exception.

Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template.

Text Tony Gaddis, Starting out with C++: from control structures through objects (7e)

References

B. Lippman, C++ Primer
Bruce Eckel, Thinking in C++
K.R. Venugopal, Mastering C++
Herbert Schildt, C++: The Complete Reference
Bjarne Stroustrup, The C++ Programming Language
Sourav Sahay, Object Oriented Programming with C++

Government Degree College for Women Begumpet, Hyderabad-500016

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B.SC I Year Examination
Semester – II
Subject: Computer Science
Paper- II–Programming in C++

Practical **3Hours/Week** **1 credit**

Course Outcomes:

1. Creating simple programs using classes and objects in C++.
2. Implement Object Oriented Programming Concepts in C++.
3. Develop applications using stream I/O and file I/O.
4. Implement simple graphical user interfaces.
5. Implement Object Oriented Programs using templates and exceptional handling concepts.

PROGRAMMING IN C++ QUESTION BANK

1. Write a program to print the sum of digits of a given number
2. Write a program to check whether the given number is Armstrong or not
3. Write a program to check whether the given string is Palindrome or not
4. Write a program to read student name, roll no, marks and display the same using class .
5. Write a program to find area of a rectangle, circle, and square using class and object.
6. Write a program to implement inline function inside and outside of a class for

a. Finding the area of a square

b. Finding the area of a cube

7. Write a program to implement friend function and friend class
8. Write a program to implement constructor and destructor with in a class.
9. Write a program to demonstrate hierarchical inheritance.
10. Write a program to demonstrate multiple inheritances.
11. Write a program to demonstrate the constructor overloading.
12. Write a program to demonstrate static polymorphism.
13. Write a program to demonstrate dynamic polymorphism.

14. Write a program to implement polymorphism using pure virtual functions.

15. Write a program to demonstrate the function templates and class templates.

16. Write a program to demonstrate exception handling using try, catch, and finally.

Government College for Women Begumpet, Hyderabad-500016
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Re-Accredited by NAAC with 'B+' Grade
B.Sc II Year
Semester-III
Subject: Computer Science
Paper- III Data Structures using C++

Theory	**4 Hours/Week**	**4 credits**
Practical	**3 Hours/Week**	**1 credit**

Course Outcomes:

1. To impart the basic concepts of data structures and algorithms
2. To understand concepts about searching and sorting techniques
3. To Understand basic concepts about stacks,queues,lists,trees and graphs
4. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

SYLLABUS

Unit – I

Fundamental Concepts: Introduction to Data Structures, Types of Data Structures, Introduction to Algorithm, Pseudo-code, Flow Chart, Analysis of Algorithms.

Linear Data Structure Using Arrays: 1-D Arrays, 2-D Arrays, N-D Arrays, Concept of Ordered List, String Manipulation, Pros and Cons of Arrays.

Stacks: Concept, Primitive Operations, Abstract Data Type, Representation Stacks Using Arrays, Prefix, Infix, Postfix Notations for Arithmetic Expression, Applications of Stacks– Converting Infix Expression to Postfix Expression, Evaluating the Postfix Expression, Processing of Function Calls, Reversing a String.

Unit – II

Recursion: Introduction, Recurrence, Use of Stack in Recursion, Variants of Recursion, Execution of Recursive Calls, Recursive Functions, Iteration versus Recursion.

Queues: Concept, Primitive Operations, Abstract Data Type, Representation Queues Using Arrays, Circular Queue, Double-Ended Queue, Applications of Queues.

Linked Lists: Introduction, Concept, Terminology, Primitive Operations-creating, inserting, deleting, traversing, Representation of Linked Lists, Linked List Abstract Data Type, Linked List Variants - Singly Linked List, Doubly Linked List, Linear and Circular Linked List.

Unit – III

Trees: Introduction, Representation of a General Tree, Binary Tree Introduction, Binary Tree Abstract Data Type, Implementation of Binary Trees, Binary Tree Traversals – Preorder, In order, Post order Traversals, Applications of Binary Trees Briefly.

Graphs: Introduction, Graph Abstract Data Type, Representation of Graphs, Graph Traversal – Depth-First Search, Breadth-First Search, Spanning Tree – Prim's Algorithm, Kruskal's Algorithm.

Hashing: Introduction, Hash Functions.

Unit – IV

Searching and Sorting: Sequential (Linear) Search, Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, and Comparison of Sorting Techniques.

Heaps: Concept, Implementation, Abstract Data Type, Heap Sort.

Text Varsha H. Patil, Data Structures Using C++

References

Nell Dale, C++ Plus Data Structures

Seymor Lipschutz, Data Structures (Revised 1e)

Adam Drozdek, Data Structures and Algorithms in C++

Mark Allen Weiss, Data structures and Algorithm Analysis in C++ (4e)

D.S. Malik, C++ Programming: Program Design Including Data Structures (6e)

Michael Main, Walter Savitch, Data Structures and Other Objects Using C++ (4e)

Michael T. Goodrich, R. Tamassia, David M. Mount, Data Structures and Algorithms in C++

Yonghui Wu, Jiande Wang, Data Structure Practice for Collegiate Programming Contests and Education

Government Degree College for Women Begumpet, Hyderabad-500016
(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.Sc II Year Examination
Semester – III
Subject: Computer Science
Data Structures Using C++ Lab

Practical **3 Hours/Week** **1 credit**

Course Outcomes:

1 To impart the basic concepts of data structures and algorithms
2 To understand concepts about searching and sorting techniques
3 To Understand basic concepts about stacks,queues,lists,trees and graph
4 To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

DATA STRUCTURES USING C++ PRACTICAL QUESTION BANK

1 Write programs to implement the following using an array: a) Stack ADT b) Queue ADT.
2 Write a program to convert the given infix expression to postfix expression using stack.
3 Write a program to evaluate a postfix expression using stack.
4 Write a program to ensure the parentheses are nested correctly in an arithmetic expression.
5 Write a program to find following using Recursion
   a) Factorial of +ve Integer b) nth term of the FiboNAACi Sequence c) GCD of two +ve integers
6 Write a program to create a single linked list and write functions to implement the following operations.
a) Insert an element at a specified position
b) Delete a specified element in the list
c) Search for an element and find its position in the list
d) Sort the elements in the list ascending order
7 Write a program to create a double linked list and write functions to implement the following operations.
   a) Insert an element at a specified position
   b) Delete a specified element in the list
   c) Search for an element and find its position in the list
   d) Sort the elements in the list ascending order
8 Write a program to create singular circular linked lists and function to implement the following operations.
   a) Insert an element at a specified position
   b) Delete a specified element in the list
   c) Search for an element and find its position in the list
9 Write programs to implement the following using a single linked list:
   a) Stack ADT b) Queue ADT.
10 Write a program to implement Binary search technique using Iterative method and Recursive methods.
11 Write a program for sorting the given list numbers in ascending order using the following technique: Bubble sort and Selection sort

12 Write a program for sorting the given list numbers in ascending order using the following technique: Insertion sort and Quick sort

13 Write a program for sorting the given list numbers in ascending order using the following technique: Merge sort and Heap sort

14 Write a program to traverse a binary tree in following way.

a) Pre-order b) In-order c) Post-order

15 Write a program to the implementation graph traversals – BFS and DFS.

16 Write a program to find the minimum spanning tree for a weighted graph using

a) Prim's Algorithm b) Kruskal's Algorithm.

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Re-Accredited by NAAC with 'B+' Grade
B.Sc II Year Examination
Semester – III
Subject: Computer Science
Paper- Python – 1 (SEC-I)

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

SYLLABUS

Unit – I

Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle, Input, Processing, and Output, Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Operators, Type conversions, Expressions.

Decision Structures and Boolean Logic: if, if-else, if-elif-else Statements, Nested Decision Structures, Comparing Strings, Logical Operators, Boolean Variables.

Repetition Structures: Introduction, while loop, for loop, Nested Loops.

Unit – II

Functions: Introduction, Defining and Calling a Void Function, Designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions- Generating Random Numbers, Writing Our Own Value-Returning Functions, The math Module, Storing Functions inModules.

File and Exceptions: Introduction to File Input and Output, Using Loops to Process Files, Processing Records, Exceptions.

Text Tony Gaddis, Starting Out With Python(3e)

References

1. Kenneth A. Lambert, Fundamentals ofPython
2. Clinton W. Brownley, Foundations for Analytics withPython
3. JamesPayne,BeginningPythonusingPython2.6andPython3
4. Charles Dierach, Introduction to Computer Science usingPython
5. PaulGries,PracticalProgramming:AnIntroductiontoComputerScienceusingPython3

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(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.Sc II Year Examination
Semester – IV
Subject: Computer Science
Paper- Database Management Systems

Theory	**4 Hours/Week**	**4credits**
Practical	**3 Hours/Week**	**1credit**

Course Outcomes:

1. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
2. Design ER-models to represent simple database application scenarios
3. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
4. Improve the database design by normalization.
5. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

SYLLABUS

Unit – I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

Relational Model: Introduction, Terminology, Integrity Constraints, Views.

The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

Unit – II

SQL: Introduction SQL Commands- DDL, DML, DCL, TCL, Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, EXISTS and NOT EXIST, Database Updates.

SQL: The ISO SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Creating an Index, Removing an Index, Views–Creating a View, Removing a View, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, Transactions.

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

Unit – III

Entity–Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models–Fan Traps, Chasm Traps.

Enhanced Entity–Relationship Modeling: Specialization/Generalization, Aggregation, Composition. Functional–Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency, Multi Valued Dependency, Join Dependency.

Normalization: The Purpose of Normalization, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization,1NF, 2NF, 3NF, BCNF.

Unit – IV

Transaction Management: Transaction ,Acid–Properties,Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery–The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques.

Security: Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

Text

Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

References

Sharon Allen, Evan Terry, Beginning Relational Data Modeling

Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, Modern Database Management Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems

Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts

C Coronel, S Morris, Peter Rob, Database Systems: Design, Implementation, and Management

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(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.Sc II Year Examination
Semester – IV
Subject: Computer Science
Database Management Systems Lab

Practical **3 Hours/Week** **1 Credit**

Course Outcomes:

1. To explain basic database concepts, applications, data models, schemas and instances.
2. To demonstrate the use of constraints and relational algebra operations. IV. Describe the basics of SQL and construct queries using SQL.
3. To emphasize the importance of normalization in databases.
4. To facilitate students in Database design
5. To familiarize issues of concurrency control and transaction management.

DATABASE MANAGEMENT SYSTEMS QUESTION BANK

credit Consider the relational schema for part of the Dream Home case study is:
Branch (branchNo, street, city, postcode)
Staff (staffNo, fName, IName, position, sex, DOB, salary, branchNo)
Property For Rent (propertyNo, street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)
Client (clientNo, fName, IName, telNo, prefType, maxRent, eMail)
Private Owner (ownerNo, fName, IName, address, telNo, eMail, password)
Viewing (clientNo, propertyNo, viewDate, comment)
Registration (clientNo, branchNo, staffNo, dateJoined)

1. Create a database with name "DreamHome" and now create all the tables listed above with constraints.
2. Insert a new row into the table supplying data for all columns.
3. Modify data in the database using UPDAT.
4. Delete data from the database using DELETE
5. Changing a table definition using ALTER
6. Removing a table using DROP
7. Removing rows in table using TRUNCATE
8. Create an index and removing an index
9. Practice other standard SQL commands for creating, modifying, displaying data of tables.
10. List full details of all staff.
11. List all staff with a salary greater than £10000.
12. List the property numbers of all properties that have been viewed.
13. Produce a list of salaries for all staff, showing only the staffNo, fName, IName, and salary details.
14. List all cities where there is either a branch office or a property for rent.
15. List all cities where there is a branch office but no properties for rent.
16. List all cities where there is both a branch office and at least one property for rent.

17. List the names and comments of all clients who have viewed a property for rent.
18. Produce a status report on property viewings.
19. List complete details of all staff who work at the branch in Glasgow.
20. List the addresses of all branch offices in London or Glasgow
21. List all staff with a salary between £20,000 and £30,000.
22. Identify all clients who have viewed all properties with three rooms.
23. How many properties cost more than £350 per month to rent?
24. How many different properties were viewed in May 2013?
25. Find the total number of Managers and the sum of their salaries.
26. Find the minimum, maximum, and average staff salary.
27. Find the number of staff working in each branch and the sum of their salaries.
28. List all managers and supervisors.
29. Find all owners with the string 'Glasgow' in their address.
30. List the details of all viewings on property PG4 where a comment has not been supplied.
31. Produce a list of salaries for all staff, arranged in descending order of salary.
32. Produce an abbreviated list of properties arranged in order of property type.
33. Find the number of staff working in each branch and the sum of their salaries.
34. For each branch office with more than one member of staff, find the number of staff working in each branch and the sum of their salaries.
35. List the staff who work in the branch at '163 Main St'.
36. List all staff whose salary is greater than the average salary, and show by how much their salary is greater than the average.
37. List the properties that are handled by staff who work in the branch at '163 Main St'.
38. Find all staff whose salary is larger than the salary of at least one member of staff at branch B003.
39. Find all staff whose salary is larger than the salary of every member of staff at branch B003
40. List the names of all clients who have viewed a property, along with any comments supplied.
41. For each branch office, list the staff numbers and names of staff who manage properties and the properties that they manage.
42. For each branch, list the staff numbers and names of staff who manage properties, including the city in which the branch is located and the properties that the staff manage.
43. Find the number of properties handled by each staff member, along with the branch number of the member of staff.
44. List all branch offices and any properties that are in the same city.
45. List all properties and any branch offices that are in the same city.
46. List the branch offices and properties that are in the same city along with any unmatched branches or properties.
47. Find all staff who work in a London branch office.
48. Construct a list of all cities where there is either a branch office or a property.
49. Construct a list of all cities where there is both a branch office and a property.
50. Create a view so that the manager at branch B003 can see the details only for staff who work in his or her branch office.
51. Create a view of the staff details at branch B003 that excludes salary information, so that only managers can access the salary details for staff who work at their branch.
52. Create a view of staff who manage properties for rent, which includes the branch number they work at, their staff number, and the number of properties they manage.
53. Removing a view using DROP VIEW
54. Give the user with authorization identifier Manager all privileges on the Staff table.
55. Give users Personnel and Director the privileges SELECT and UPDATE on column salary of the Staff table.

56. Revoke the privilege SELECT on the Branch table from all users.
57. Revoke all privileges you have given to Director on the Staff table.
58. Demonstrate exceptions in PL/SQL
59. Demonstrate cursors in PL/SQL
60. Write PL/SQL queries to create procedures.
61. Write PL/SQL queries to create functions.
62. Write PL/SQL queries to create package.
63. Write PL/SQL queries to create triggers.
64. Write PL/SQL queries using recursion.

Consider the relational schema for part of the Hotel case study is:

Hotel (hotelNo, hotelName, city)
Room (roomNo, hotelNo, type, price)
Booking (hotelNo, guestNo, dateFrom, dateTo, roomNo)
Guest (guestNo, guestName, guestAddress)

65. Create a database with name "Hotel" and now create all the tables listed above with constraints.
66. Insert a new row into the table supplying data for all columns.
67. Modify data in the database using UPDATE
68. Delete data from the database using DELETE
69. Changing a table definition using ALTER
70. Removing a table using DROP
71. Removing rows in table using TRUNCATE
72. Practice other standard SQL commands for creating, modifying, displaying data of tables.
73. List full details of all hotels.
74. List full details of all hotels in London.
75. List the names and addresses of all guests living in London, alphabetically ordered by name.
76. List all double or family rooms with a price below £40.00 per night, in ascending order of price.
77. List the bookings for which no dateTo has been specified.
78. How many hotels are there?
79. What is the average price of a room?
80. What is the total revenue per night from all double rooms?
81. How many different guests have made bookings for August?
82. List the price and type of all rooms at the Grosvenor Hotel.
83. List all guests currently staying at the Grosvenor Hotel.
84. List the details of all rooms at the Grosvenor Hotel, including the name of the guest staying in the room.
85. What is the total income from bookings for the Grosvenor Hotel today?
86. List the rooms that are currently unoccupied at the Grosvenor Hotel.
87. What is the lost income from unoccupied rooms at the Grosvenor Hotel?
88. List the number of rooms in each hotel.
89. List the number of rooms in each hotel in London.
90. What is the average number of bookings for each hotel in August?
91. What is the most commonly booked room type for each hotel in London?
92. What is the lost income from unoccupied rooms at each hotel today?
93. Insert rows into each of these tables.
94. Update the price of all rooms by 5%.
95. Demonstrate that queries written using the UNION operator and same can be rewritten using the OR.
96. Apply the syntax for inserting data into a table.

97. Create a view containing the cheapest hotels in the world.
98. Create the Hotel table using the integrity enhancement features of SQL.
99. Create a database trigger for the following situations:
    (a) The price of all double rooms must be greater than £100.
    (b) The price of double rooms must be greater than the price of the highest single room.
    (c) A booking cannot be for a hotel room that is already booked for any of the specified dates.
    (d) A guest cannot make two bookings with overlapping dates.
    (e) Maintain an audit table with the names and addresses of all guests who make bookings for hotels in London (do not store duplicate guest details).

Given relation schemas are

Sailors (sid : **integer**, sname : string, rating : integer, age : real)
Boats (bid : integer, bname : string, color : string)
Reserves (sid : integer , bid : integer, day : date)

100. Find the names and ages of all sailors.
101. Find all sailors with a rating above 7.
102. Find the names of sailors who have reserved boat 103.
103. Find the sids of sailors who have reserved a red boat.
104. Find the names of sailors who have reserved a red boat.
105. Find the colors of boats reserved by Lubber.
106. Find the names of sailors who have reserved at least one boat.
107. Find the names of sailors who have reserved at least two boats.
108. Compute increments for the ratings of persons who have sailed two different boats on the same day.
109. Find the ages of sailors whose name begins and ends with B and has at least three characters.
110. Find the names of sailors who have reserved a red or a green boat.
111. Find the names of sailors who have reserved a red and a green boat.
112. Find the sids of all sailors who have reserved red boats but not green boats.
113. Find all sids of sailors who have a rating of 10 or have reserved boat 104.
114. Find the names of sailors who have not reserved a red boat.
115. Find sailors whose rating is better than some sailor called Horatio.
116. Find sailors whose rating is better than every sailor called Horatio.
117. Find the names of sailors who have reserved all boats.
118. Find the names of sailors who have reserved at least two boats.
119. Find the names of sailors who have reserved all boats called Interlake.
120. Find sailors who have reserved all red boats.
121. Find the sailor name, boat id, and reservation date for each reservation.
122. Find the sids of sailors with age over 20 who have not reserved a red boat.
123. Find the average age of all sailors.
124. Find the average age of sailors with a rating of 10.
125. Find the name and age of the oldest sailor.
126. Count the number of different sailor names.
127. Find the names of sailors who are older than the oldest sailor with a rating of 10.
128. Find the sailors with the highest rating.
129. Find the age of the youngest sailor for each rating level.
130. Find age of the youngest sailor who is eligible to vote for each rating level with at least 2 such sailors.

131. Find the average age of sailors for each rating level that has at least two sailors.
132. For each red boat, find the number of reservations for this boat.
133. Find the average age of sailors who are of voting age (i.e., at least 18 years old) for each level that has at least two sailors.
134. Delete the records of sailors who have rating 8 (deleting some rows in a table).
135. Loading data which is present in the text into the table.

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B.Sc II Year Examination
Semester – IV
Subject: Computer Science
Paper- Python – 2 (SEC-3)

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

SYLLABUS

Unit – I

Lists and Tuples: Sequences, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Processing Lists, Two-Dimensional Lists, Tuples.
Strings: Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings.
Dictionaries and Sets: Dictionaries, Sets, Serializing Objects.
Recursion: Introduction, Problem Solving with Recursion, Examples of Recursive Algorithms.

Unit – II

Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances, Techniques for Designing Classes, Inheritance, Polymorphism.
GUI Programming: Graphical User Interfaces, Using the tkinter Module, Display text with Label Widgets, Organizing
Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons.

Text Tony Gaddis, Starting Out With Python(3e)

References

1. Kenneth A. Lambert, Fundamentals ofPython
2. Clinton W. Brownley, Foundations for Analytics withPython
3. JamesPayne,BeginningPythonusingPython2.6andPython3
4. Charles Dierach, Introduction to Computer Science usingPython
5. PaulGries,PracticalProgramming:AnIntroductiontoComputerScienceusingPython3

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B.Sc (MSCS/MPCS) III Year
Semester-V
Subject: Computer Science
Paper- V Programming in JAVA

Theory	**3 Hours/Week**	**3 credits**
Practical	**2 Hours/Week**	**1 credit**

Course Outcomes:

1. Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
3. Understand the principles of inheritance, packages and interfaces.

SYLLABUS

Unit – I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Type Conversion, Casting, Conditional Statements, Loops, Branching Mechanism, Classes, Objects, Class Declaration, Creating Objects, Method Declaration and Invocation, Method Overloading.

Unit- II

Constructors– Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects, Class Variables & Methods-static Keyword, this Keyword, One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class.

Inheritance: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keywords, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

Packages–Creating and Using Packages, Access Protection, Wrapper Classes, String Class, String Buffer Class.

Unit - III

Exception: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

Multithreading: Introduction, Main Thread, Creation of New Threads – By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority, Synchronization.

Input/ Output: Introduction, java.io Package, File Class, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

Unit - IV

Applets: Introduction, Example, Life Cycle, Applet Class, Common Methods Used in Displaying the Output.

Event Handling: Introduction, Types of Events

AWT: Introduction, Button, Label, Checkbox, choice, list, panel, dialog.

Swing: Introduction, Differences between Swing and AWT, Jframe, Japplet, Jpanel, Layout Managers, Jtable, Dialog Box.

Database Handling Using JDBC: Introduction, Types of JDBC Drivers, Load the Driver, Establish Connection, Create Statement, Execute Query, Iterate Resultset, Scrollable Resultset, Developing a JDBS Application.

Text Sachin Malhotra, Saurabh Choudhary, Programming in Java (2e)

References

Bruce Eckel, Thinking in Java (4e)
Herbert Schildt, Java: The Complete Reference (9e)
Y. Daniel Liang, Introduction to Java Programming (10e)
Paul Deitel, Harvey Deitel, Java: How To Program (10e)
Cay S. Horsttnann, Core Java Volume I – Fundamentals (10e)
C. Thomas Wu, An introduction to object-oriented programming with Java (5e)
Tony Gaddis, Starting Out with Java From Control Structures Through Objects (6e)
Jeanne Boyarsky, Scott Selikoff, OCA: Oracle Certified Associate Java SE 8 Programmer–I Study Guide

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B.Sc (MSCS/MPCS) III Year Examination
Semester – V
Subject: Computer Science
Paper- V–PROGRAMMING IN JAVA LAB

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
2. Read and make elementary modifications to Java programs that solve real-world problems.
3. Validate input in a Java program.
4. Identify and fix defects and common security issues in code.
5. Document a Java program using Javadoc.
6. Use a version control system to track source code in a project.

PROGRAMMING IN JAVA QUESTION BANK

1. Write java programs to find the following
   a) largest of given three numbers b) reverses the digits of a number
   c) given number is prime or not d) GCD of given two integers
2. Write java programs that implement the following
   a) default constructor b) parameterized constructor c) constructor overloading
3. Write a java program to find the smallest of given list integers using array and scanner class.
4. Write a java program for multiplication of two matrices.
5. Write a java program for demonstrating an inner classes or nested classes.
6. Write a java program to implement method overloading, method overriding, dynamic method dispatch
7. Write a java program to implement single, multilevel, hierarchal, multiple, hybrid inheritances.
8. Write java programs that demonstrate the use of abstract, this, super, static, final keywords
9. a) Write a java program for creating a package and using a package.

b) Write a java program to demonstrate the use of wrapper classes.

10. a) Write a java program using all five keywords of exception handling mechanism.
    b) Write a java program for creating customized (user) exception
11. a) Write a java program that checks whether a given string is a palindrome or not.
    b) Write a java program for sorting a given list of names in ascending order.
12. a) Write a java program to create a file, write the data and display the data.
    b) Write a java program that reads a file name from user and displays its information.
13. a) Write a java program for controlling main thread.
    b) Write a java program for creating new thread by extending Thread class.
14. a) Write a java program for creating new thread by implementing Runnable interface.
    b) Write a java program for thread synchronization.
15. a) Write a java program to create following AWT components: Button, Checkbox and List.
    b) Write java programs to create AWT application using containers and layouts.
16. a) Write java programs to create a simple Applet and create swing based Applet.
    b) Write a java program to handle different types of events in a swing application.

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B.Sc (MSCS/MPCS) III Year Examination
Semester – V
Subject: Computer Science
Paper- VI–Operating System

Theory	**3 Hours/Week**	**3 credits**
Practical	**2 Hours/Week**	**1 credits**

Course Outcomes:

1. Identify the role of Operating System. To understand the design of control unit.
2. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems.
3. Describe the role of paging, segmentation and virtual memory in operating systems.
4. Description of protection and security and also the Comparison of UNIX and Windows based OS.
5. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling

SYLLABUS

Unit – I

Introduction: Computer-System Architecture, Computing Environments.
Operating-System Structures: Operating-System Services, User Interface for Operating-System, System Calls, Types of System Calls, Operating System Structure.
Process Management: Process Concept, Process Scheduling, Operations on Processes, Inter process Communication, Examples–Producer-Consumer Problem.

Unit - II

Process Synchronization: Critical-Section Problem, Peterson's Solution, Synchronization, Semaphores, Monitors.
CPU Scheduling: Concepts, Scheduling Criteria, Scheduling Algorithms.

Unit - III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.
Main Memory: Introduction, Swapping, Contiguous Memory Allocation, Segmentation, Paging. Virtual

Unit - IV

Memory: Introduction, Demand Paging, Page Replacement, Allocation of Frames, Thrashing. Mass-Storage Structure: Overview, Disk Scheduling, RAID Structure.
File Systems: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, Protection. File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

Text Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating System Concepts (9e)

References

Naresh Chauhan, Principles of Operating Systems Thomas W. Doeppner, Operating Systems in Depth Andrew S. Tanenbaum, Modern Operating Systems
William Stallings, Operating Systems – Internals and Design Principles
Dhananjay M. Dhandhere, Operating Systems – A Concept Based Approach

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B.Sc (MSCS/MPCS) III Year Examination
Semester – V
Subject: Computer Science
Paper- VI–Operating System Lab

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. Know how data is transmitted and checking of errors.,
2. Inter process communication including shared memory, pipes and messages Simulation of CPU Scheduling Algorithms. (FCFS, RR, SJF, Priority, Multilevel Queuing)
3. Simulation of Banker's Algorithm for Deadlock Avoidance, Prevention Program for FIFO, LRU, and OPTIMAL page replacement algorithm.
4. Pre requisite: Knowledge on Operating system principles and network principles.

OPERATING SYSTEM QUESTION BANK

1 a)Use vi editor to create different files, writing data into files, modifying data in files.

b) Use different types of Unix commands on the files created in first program.

2 Write shell programs using 'case', 'then' and 'if' & 'else' statements.

3 Write shell programs using while, do-while and for loop statements.

4 a) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

b) Write a shell script that takes a command –line argument and reports on whether it is directory, afile, or something else.

5. a)Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers..

b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

6. a)Write a shell script that displays a list of all the files in the current directory to which the User has read, write and execute permissions.

b)Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.

7. Write a program that simulate the following Unix commands like ls, mv, cp.

8 Write a program to convert upper case to lower case letters of a given ASCII file.

9 Write a program to program to search the given pattern in a file.

10 Write a program to demonstrate FCFS process schedules on the given data.

11 Write a program to demonstrate SJF process schedules on the given data.
12 Write a program to demonstrate Priority Scheduling on the given burst time and arrival times.
13 Write a program to demonstrate Round Robin Scheduling on the given burst time and arrival times.
14 Write a program to implementing Producer and Consumer problem using Semaphores.
15 Write a program to simulate FIFO, LRU, LFU Page replacement algorithms.
16 Write a program to simulate Sequential, Indexed, and Linked file allocation strategies.

Note:
Recommended to use Open Source Software like Fedora, Ubuntu, CentOS, etc...

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B.Sc (MSCS/MPCS) III Year Examination
Semester – V
GE: Information Technologies – 1

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

(1) To keep track of the latest developments in information technologies

(2) To use modern technologies to access, organize, store, manipulate, interpret and present information, and thus to empower them to be more ready for problem solving and creative applications in their respective disciplines using computer-aided means.

SYLLABUS

Unit – I

Introduction to Computers: What is a Computer? Characteristics of Computers, Generations of Computers, Classification of Computers, Basic Computer Organization, Applications of Computers.

Input and Output Devices: Input Devices, Output Devices, Soft Copy Devices, Hard Copy Devices.

Computer Memory and Processors: introduction, Memory Hierarchy, Processor Registers, Cache Memory, Primary Memory, Secondary Storage Devices, Hard Disks, Optical Drives, USB Flash Drives, Memory Cards.

Unit – II

Computer Software: Introduction, Classification of Computer Software, System Software, Applications Software, Firmware, Middleware, Acquiring Computer Software.

Operating Systems: Introduction, Evolution of OS, Process Management, Memory Management, File Management, Device Management, Security Management, Command Interpreter, Windows, Linux.

Text

Reema Thareja, Fundamentals of Computers

References

P. K. sinha, Computer Fundamentals
Anita Goel, Computer Fundamentals
V. Rajaraman, Fundamentals of Computers
E. Balagurusamy, Fundamentals of Computers
J. Glenn Brookshear, Dennis Brylow, Computer Science An Overview

Government Degree College for Women Begumpet, Hyderabad-500016

(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.Sc (MSCS/MPCS) III Year Examination
Semester – V
SEC: Python – 1

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

SYLLABUS

Unit - I

Introduction to Python: Python, Features of Python, Execution of a Python Program, Viewing the Byte Code, Flavors of Python, Python Virtual Machine, Frozen Binaries, Memory Management in Python, Garbage Collection in Python, Comparisons between C and Python, Comparisons between Java and Python.

Writing Our First Python Program: Installing Python for Windows, Installing numpy, Setting the Path to Python, Writing Our First Python Program, Executing a Python Program, Getting Help in Python, Getting Python Documentation Help, Reopening the Python Program in IDLE.

Data types in Python: Comments in Python, Doc strings, How Python Sees Variables, Data types in Python, Built-in data types, bool Data type, Sequences in Python, Sets, Literals in Python, Determining the Data type of a Variable, What about Characters, User-defined Data types, Constants in Python, Identifiers and Reserved words, Naming Conventions in Python.

Unit – II

Operators in Python: Arithmetic Operators, Assignment Operators, Unary Minus Operator, Relational Operators, Logical Operators, Boolean Operators, Bitwise Operators, Membership Operators, Identity Operators, Operator Precedence and Associativity, Mathematical Functions.

Input and Output: Output statements, Input Statements, Command Line Arguments.

Control Statements: Control Statements, The if Statement, A Word on Indentation, The if … else Statement, The if … elif … else Statement, The while Loop, The for Loop, Infinite Loops, Nested Loops, The else Suite, The break Statement, The continue Statement, The pass Statement, The assert Statement, The return Statement.

Text

R. Nageswara Rao, Corer Python Programming, Dreamtech Press

Reference s

Mark Lutz, Learning Python

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Re-Accredited by NAAC with 'B+' Grade
B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper- VII–COMPUTER NETWORKS

Theory	**3 Hours/Week**	**3 credits**
Practical	**2 Hours/Week**	**1 credit**

Course Outcomes:

1. Describe the general principles of data communication.
2. Describe how computer networks are organized with the concept of layered approach.
3. Describe how signals are used to transfer data between nodes.
4. Implement a simple LAN with hubs, bridges and switches.
5. Describe how packets in the Internet are delivered.
6. Analyze the contents in a given data link layer packet, based on the layer con¬cept.
7. Design logical sub-address blocks with a given address block.
8. Decide routing entries given a simple example of network topology
9. Describe what classless addressing scheme is.
10. Describe how routing protocols work.
11. Use C programming language to implement network programs.
12. Design and implement a network protocol.

SYLLABUS

Unit – I

Introduction: Data Communication Components, Line Configuration, Topologies, Transmission Mode, Categories of Networks, ISO Reference Model–Layered Architecture, Functions of Layers, TCP/IP Reference Model.

Transmission Media: Guided Media–Twisted Pair Cable, Coaxial Cable, Optical Fiber, Unguided Media– Satellite Communication, and Cellular Telephony.

Unit - II

Multiplexing: Frequency –Division Multiplexing, Time–Division Multiplexing.

Data Link Layer: Error Detection –VRC, LRC, CRC, Checksum, Error Correction–Hamming Code, Burst Error Correction, Line Discipline–ENQ/ACK, Poll/Select, Flow Control–Stop-and-Wait, Sliding Window, Error Control–Stop-and-Wait ARQ, Sliding Window ARQ Go-Back-n ARQ, Selective-Reject ARQ.

Unit - III

Local Area Networks: Introduction to IEEE 802, Ethernet-CSMA/CD, Implementation, Token Ring,-Token Passing, Implementation.

Switching: Circuit Switching, Packet Switching, Message Switching.

Unit - IV

Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Brouters, Switches, Distance Vector Routing Algorithm, Link State Routing Algorithm.

Transport Layer: Duties of Transport Layer, Connection.

Upper OSI Layers; Session Layer, Presentation Layer, Application Layer.

Text

Behrouz A. Forouzan, Data Communication and Networking (2e Update)

References

S.S. Shinde, Computer Networks
William Stallings, Data and Computer Communications
Andrew S. Tanenbaum, David J Wetherall, Computer Networks
Behrouz A Forouzan, Firouz Mosharraf, Computer Networks A Top-Down Approach

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B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper- VII–COMPUTER NETWORKS LAB

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. Understand the structure and organization of computer networks;
2. Including the division into network layers, role of each layer, and relationships between the layers.
    a. Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.
    b. In depth understanding of transport layer concepts and protocol design;
3. Including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.

COMPUTER NETWORKS QUESTION BANK

1 Write a program to create a socket and implement connect function.

2 Write a program to get MAC address.

3 Write a program to display hello world using signals.

4 Write a program for socket pair system call using IPC.

5 Write a program to implement the sliding window protocol.

6 Write a program to identify the category of IP address for a given IP address.

7 Write a program to print details of DNS host.

8 Write a program to implement listener and talker.

9 Write a program to implement TCP echo using client–server program.

10 Write a program to implement UDP echo using client–server program.

11 Write a UDP client–server program to convert lowercase letters to uppercase letters.

12 Write a TCP client–server program to convert a given string into reverse.

13 Write a UDP client–server program to convert a given string into reverse.

14 Write a program to implement TCP iterative client–server program.

15 Write a program to implement time service using TCP client–server program.

16 Write a program to implement time service using UDP client–server program.

Note:
Write above program using C language on Unix/Linux systems.

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B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper: VIII PHP with MySQL

Theory	**3 Hours/Week**	**3 credits**
Practical	**2 Hours/Week**	**1 credit**

Course Outcomes:

1. List the major elements of the PHP & MySQL work and explain why PHP is good for web development
2. Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.
3. Analyze the basic structure of a PHP web application and be able to install and maintain the web server, compile, and run a simple web application.
4. Learn how databases work and how to design one, as well as how to use php MyAdmin to work with MySQL.
5. Learn different ways of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data. Connect to SQL Server and other data sources

SYLLABUS

Unit – I

Introducing PHP – What is PHP? Why use PHP? Evolution of PHP, Installing PHP, Other ways to run PHP, Creating your first script. PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants. Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML.

Unit - II

Strings – Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings.

Arrays – Creating Arrays, Accessing Array Elements, Looping Through Arrays with for-each, Working with Multidimensional Arrays, Manipulating Arrays.

Functions – What is a Function? Why Functions are useful? Calling Functions, Working with Variable Functions, Writing your own Functions, Working with References, Writing Recursive Functions.

Unit - III

Objects – Introduction OOP Concepts, Creating Classes and Objects in PHP, Creating and using Properties, Working with Methods, Object Overloading with _get(), _set() and _call(), Using Inheritance to Extend Power of Objects, Constructors and Destructors, Automatically Loading Class Files, Storing as Strings.

Handling HTML Forms with PHP – How HTML form works, Capturing Form Data with PHP, Dealing with Multi-Value Fields, Generating Web Forms with PHP, Storing PHP Variables in Forms, Creating File Upload Forms, Redirecting After a Form Submission.

Unit – IV

Working with Files and Directories - Getting Information on Files, Opening and Closing Files, Reading and Writing to Files, Copying, Renaming, and Deleting Files, Working with Directories. **Introducing Databases and SQL** – Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL from PHP. **Retrieving Data from MySQL with PHP** – Setting Up the Book Club Database, Retrieving Data with SELECT, Creating a Member Record Viewer. Manipulating MySQL Data with PHP – Inserting, Updating, and Deleting Records, Building a Member Registration Application.

Text

Matt Doyle, Beginning PHP 5.3 (Wrox – Wiley Publishing)

References

Ellie Quigley, PHP and MySQL by Example
Joel Murach, Ray Harris, Murach's PHP and MySQL
Brett McLaughlin, PHP & MySQL: The Missing Manual
Luke Welling, Laura Thomson, PHP and MySQL Web Development
W. Jason Gilmore, Beginning PHP and MySQL From Novice to Professional
Andrew Curioso, Ronald Bradford, Patrick Galbraith, Expert PHP and MySQL

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B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper VIII PHP with MySQL Lab

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. The objective of this course is to provide the necessary knowledge to design and develop dynamic
2. Database-driven web applications using PHP version 5.
3. Students will learn how to connect to any ODBC-compliant database, and perform hands on practice with a MySQL database to create database-driven HTML forms and reports etc.
4. Students also learn how to configure PHP and Apache Web Server. Comprehensive lab exercises provide facilitated hands on practice crucial to develop competence web sites.

PHP WITH MYSQL QUESTION BANK

1 a) Write a PHP script to find the factorial of a given number.

b) Write a PHP script to find the sum of digits of a given number.

2 a) Write a PHP script to find whether the given number is a prime or not.

b) Write a PHP script to demonstrate the use of break, continue statements using nested loops.

3 a) Write a PHP script to display the FiboNAACi sequence with HTML page.

b) Write a PHP script to create a chess board.

4 a) Write a PHP script using built-in string function like strstr (), strops(), substr_count(), etc...

b) Write a PHP script to transform a string to uppercase, lowercase letters, make a string's first character uppercase.

5 a)Write a PHP script that inserts a new item in an array in any position.

b)Write a PHP function to check whether all array values are strings or not.

6 a)Write a PHP script to count number of elements in an array and display a range of array elements.

b) Write a PHP script to sort a multi-dimensional array set by a specific key.

7 a) Write a PHP script using a function to display the entered string in reverse.

b) Write a PHP script using function for sorting words in a block of text by length.

8 a) Write a PHP script for creating the FiboNAACi sequence with recursive function.

b) Write a PHP script using pass by value and pass by reference mechanisms in passing arguments to functions.

9 a) Write a PHP script to demonstrate the defining and using object properties.

b) Write a PHP script to demonstrate the inheritance.

10 a) Write a PHP script to demonstrate the object overloading with _get (), _set(), and _call().

b) Write a PHP script to demonstrate the overloading property accesses with _get () and _set().

11 a) Write a PHP script to demonstrate the method overloading and method overriding mechanisms.

b) Write a PHP script to demonstrate the use of final classes and final methods.

12 a) Write a PHP script to demonstrate the use interfaces.

b) Write a PHP script using constructors and destructors.

13 Write a PHP application to handling HTML forms with PHP script.

14 a) Write a PHP script to create a file, write data into file and display the file's data.

b) Write a PHP script to check and change file permissions, copying, renaming and deleting files.

15 a) Write a PHP application for connecting to MySQL and reading data from database table.

b) Write a PHP application for inserting, updating, deleting records in the database table.

16 Write a PHP application for student registration form.

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B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper: GE: Information Technologies – 2

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. competently use professional skills and knowledge in the systematic development of complex information systems
2. apply their skills and knowledge in a professionally responsible manner
3. communicate effectively with other computer scientists and the wider global community using a wide range of communication technologies
4. undertake research in information technology

SYLLABUS

Unit – I

Introduction to Algorithms and Programming Languages: Algorithm, Control Structures, Flowcharts, Pseudo code, Programming Languages, Generations of Programming Languages.

Database Systems: File Oriented Approach; Database Oriented Approach, Database Views, Three-Schema Architecture, Database Models, Components of DBMS, Introduction of SQL Queries.

Unit – II

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model.

The Internet: Internet Services, Types of Internet Connections, Internet Security.

Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, On0demand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

Text

Reema Thareja, Fundamentals of Computers

References

P. K. sinha, Computer Fundamentals
Anita Goel, Computer Fundamentals
V. Rajaraman, Fundamentals of Computers
E. Balagurusamy, Fundamentals of Computers
J. Glenn Brookshear, Dennis Brylow, Computer Science an Overview

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B.Sc (MSCS/MPCS) III Year Examination
Semester – VI
Subject: Computer Science
Paper: SEC: Python - 2

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

SYLLABUS

Unit - I

Arrays in Python: Array, Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Processing the Arrays, Types of Arrays, Working with Arrays using numpy, Creating Arrays using array(), linspace, logspace, arange(), zeros() and ones() Functions, Mathematical Operations on Arrays, Comparing Arrays, Aliasing the Arrays, Viewing and Copying Arrays, Slicing and Indexing in numpy Arrays, Dimensions of Arrays, Attributes of an Array, The reshape() Method, The flatten() Method, Working with Multi-dimensional Arrays, Indexing in Multi-dimensional Arrays, Slicing the Multi-dimensional Arrays, Matrices in numpy, Getting Diagonal Elements of a Matrix, Finding Maximum and Minimum Elements, Finding Sum and Average of Elements, Products of Elements, Sorting the Matrix, Transpose of a Matrix, Matrix Addition and Multiplication, Random Numbers.

Strings and Characters: Creating Strings, Length of a String, Indexing in Strings, Slicing the Strings, Repeating the Strings, Concatenation of Strings, Checking Membership, Comparing Strings, Removing Spaces from a String, Finding Sub Strings, Counting Substrings in a String, Strings are Immutable, Replacing a String with another String, Splitting and Joining Strings, Changing Case of a String, Checking Starting and Ending of a String, String Testing Methods, Formatting the Strings, Working with Characters, Sorting Strings, Searching in the Strings, Finding Number of Characters and Words, Inserting Sub String into a String.

Unit – II

Functions: Difference between a Function and a Method, Defining a Function, Calling a Function, Returning Results from a Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Local and Global Variables.

Lists and Tuples: List, Creating Lists using range() Function, Updating the Elements of a List, Concatenation of Two Lists, Repetition of Lists, Membership in Lists, Aliasing and Cloning Lists, Methods to Process Lists, Finding Biggest and Smallest Elements in a List, Sorting the List

Elements, Number of Occurrences of an Element in the List, Finding Common Elements in Two Lists, Storing Different Types of Data in a List, Nested Lists, Nested Lists as Matrices, List Comprehensions, Tuples, Creating Tuples, Accessing the Tuple Elements, Basic Operations on Tuples, Functions to Process Tuples, Nested Tuples, Inserting Elements in a Tuple, Modifying Elements of a Tuple, Deleting Elements from a Tuple.

Dictionaries: Operations on Dictionaries, Dictionary Methods, Using for Loop with Dictionaries, Sorting the Elements of a Dictionary using Lambdas, Converting Lists into Dictionary, Converting Strings into Dictionary.

Text

R. Nageswara Rao, Corer Python Programming, Dreamtech Press

References

Mark Lutz, Learning Python
Tony Gaddis, Starting Out With Python
Kenneth A. Lambert, Fundamentals of Python
James Payne, Beginning Python using Python 2.6 and Python 3
Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3

Government Degree College for Women Begumpet, Hyderabad-500016

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MODEL PAPER

Time: 2 1/2hr **Max Marks: 60**

SECTION-A

I Short Answer Questions
Answer any Five of the following questions **5x4=20marks**

1. **Question from unit -1.**
2. **Question from unit -1.**
3. **Question from unit -2.**
4. **Question from unit -2.**
5. **Question from unit -3.**
6. **Question from unit -3.**
7. **Question from unit -4.**
8. **Question from unit -4.**

SECTION-B

II Essay Questions
Answer all questions choosing any one bit from each question **4x10=40marks**

9. a) Question from unit-1.
(Or)

b) Question from unit-1

10. a) Question from unit-2.
(Or)

b)Question from unit-2

11. a) Question from unit-3.
(Or)

b) Question from unit-3.

12. a) Question from unit-4.
(Or)

b) Question from unit-4.

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SEC

MODEL PAPER

Time:1hrs **Max Marks: 40**

SECTION-A

I. Answer any 4 out of 6 questions. **4*4=16**

9. **Question from unit -1.**
10. **Question from unit -1.**
11. **Question from unit -1.**
12. **Question from unit -2.**
13. **Question from unit -2.**
14. **Question from unit -2.**

SECTION-B

II. Answer the following questions. **2x12=24**

1. a) Question from unit-1.
(Or)

b) Question from unit-1

2. a) Question from unit-2.
(Or)

b) Question from unit-2.

Practical Examinations

1. Practical examinations will be held at the end of each Semester.
2. 50 marks are allotted for the Practical examination consisting of External and Internal Evaluation.
3. Practical Question Bank is prepared & provided to the students from which practicals will be conducted.
4. Practicals shall be conducted in each Semester as per the Syllabus and Time table.
   Resolved to accept the above pattern of examination

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET

(AUTONOMOUS)

CHOICE BASED CREDIT SYSTEM

(CBCS)

SYLLABUS

For

B.A (COMPUTER APPLICATIONS)

Under Graduate Programme

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

(W.e.f. 2020 - 21 Session)

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAM SPECIFIC OUTCOMES

1) Ability to pursue careers in IT industry/ consultancy/ research and development, teaching and allied areas related to computer science.
2) Comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Multimedia, Web Design and Big Data Analytics for efficient design of computer-based systems of varying complexity.

GOVERNMENT DEGREE COLLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERABAD

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

ALLOCATION OF CREDITS

Course Code	Course Title	Course Type	Hours per Week	Credits
SEMESTER – I				
106	Programming in C	DSC-3A	4T+3P=7	4+1=5
SEMESTER – II				
206	Programming in C++	DSC-3B	4T+3P=7	4+1=5
SEMESTER – III				
301	A:Scilab - 1	SEC-1	2	2
	B: Python - 1			
306	Relational Database Management System	DSC-3C	4T+3P=7	4+1=5
SEMESTER – IV				
401	C: SciLab – 2	SEC-2	2	2
	D: Python – 2			
406	Multimedia Systems	DSC- 3C	4T+3P=7	4+1=5
SEMESTER – V				
501	Information Technologies – 1	GE–1	2	2
505	Multimedia Systems	DSC- 3E	3T+2P=5	3+1=4
506	Elective–A: Web Technologies	DSE-1E	3T+2P=5	3+1=4
	Elective–B: Visual Programming	DSE-2E	3T+2P=5	3+1=4
SEMESTER – VI				
601	Information Technologies – 2	GE–2	2	2

605	**Mobile Applications**	**DSC–3F**	**3T+2P=5**	**3+1=4**
606	**Elective–A: PHP Programming**	**DSE–1F**	**3T+2P=5**	**3+1=4**
	Elective–B: Information Security and Cyber Laws	**DSE–2F**	**3T+2P=5**	**3+1=4**
	PROJECT			**1**

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B.A (C/A) I YEAR
Semester-I
Subject: Computer Applications
Paper- I Programming in C

Theory: 4 **Hours/Week** **4 credits**

Course Outcome:

1) Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
2) Demonstrate an understanding of computer programming language concepts. To be able to develop C programs on Linux platform.
3) Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
4) Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures.
5) Student must be able to define union and enumeration user defined data types. Develop confidence for self education and ability for life-long learning needed for Computer language.

Syllabus

Unit – I

Computer Fundamentals: Introduction of Computers, Classification of Computers, Anatomy of a Computer, Memory Hierarchy, Introduction to OS.
Program Fundamentals: Generation and Classification of Programming Languages,Writing first C Program
Algorithms: Definitions, Different Ways of Stating Algorithms (Step-form, Pseudo-code, Flowchart), Strategy for Designing Algorithms.
Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Type Conversions.

Unit – II

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences,

Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements–while, for, do-while; Special Control Statement–goto, break, continue, return, exit.
Arrays and Strings: One and Two Dimensional Arrays, Character Arrays, Functions from ctype.h, string.h.

Unit – III
Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion.
Pointers: Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Dynamic Memory Allocation.

Unit – IV
User-Defined Data Types: Declaring a Structure (Union) and its members, Initialization Structure (Union), Accessing members of a Structure (Union), Structures verses Unions, Enumeration Types.
Files: Introduction, Using Files, Working with Text Files and Binary Files, Other File Management Functions.

Text
PradipDey, ManasGhosh, Computer Fundamentals and Programming in C (2e)
References

1. Ivor Horton, Beginning C
2. Herbert Schildt, The Complete Reference C
3. Paul Deitel, Harvey Deitel, C How To Program
4. Byron S. Gottfried, Theory and Problems of Programming with C
5. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language
6. B. A. Forouzan, R. F. Gilberg, A Structured Programming Approach Using C

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B.A (C/A) I YEAR
Semester-I
Subject: Computer Applications
Paper- I Programming in C

Course Outcome:

1) Know concepts in problem solving ·
2) To do programming in C language ·
3) To write diversified solutions using C language.

Practical Question Bank

Practical: 3 Hours/Week **1 credit**

1. Write a program to find the largest two numbers using if and conditional operator.
2. Write a program to calculate arithmetic operations of two numbers using switch.
3. Write a program to print the reverse of a given number.
4. Write a program to print whether the given number is a prime or not.
5. Write a program to find largest and smallest elements in a given list of numbers.
6. Write a program to find the sum of two matrices.
7. Write a program to find the product of two matrices.
8. Write a program to print the reverse of a given string.
9. Write a program to find the factorial of a positive integer using iteration and recursion.
10. Write a program to find the GCD of two positive integers using iteration and recursion.
11. Write a program to demonstrate the call by value and the call by reference concepts.
12. Write a program to illustrate the use of Enumeration data type.
13. Write a program to illustrate the use of structure concept.
14. Write a program to illustrate the use of union concept.

15. Write a program to write content into a file and display contents of a file

16. Write a program to copy content of one file into another file and display the content of new file.

Note

Write the Pseudo Code and draw Flow Chart for the above programs.

Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows 10.

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Re-Accredited by NAAC with 'B+' Grade
B.A (C/A) I YEAR
Semester-II
Subject: Computer Applications
Paper- II Programming in C++

Theory **4 Hours/Week** **4credits**

Course Outcome:

1) To understand how C++ improves C with object-oriented features.
2) To learn how to write inline functions for efficiency and performance.
3) To learn the syntax and semantics of the C++ programming language.
4) To learn how to design C++ classes for code reuse.
5) To learn how to implement copy constructors and class member functions.
6) To understand the concept of data abstraction and encapsulation.
7) To learn how to overload functions and operators in C++.
8) To learn how containment and inheritance promote code reuse in C++.
9) To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
10) To learn how to design and implement generic classes with C++ templates.
11) To learn how to use exception handling in C++ programs.

Syllabus

Unit – I

Introduction to C++: Applications, Example Programs, Tokens, Data Types, Operators, Expressions, Control Structures, Arrays, Strings, Pointers, Arrays.

Functions: Introduction, Prototype, Passing Data by Value, Reference Variables, Using Reference Variables as Parameters, Inline Functions, Default Arguments, Overloading Functions, Passing Arrays to Functions.

Unit – II

Object Oriented Programming: Procedural Programming verses Object-Oriented Programming, Terminology, Benefits, OOP Languages, and OOP Applications.

Classes: Introduction, Defining an Instance of a Class, Private Members, Inline Member Functions, Constructors, Passing Arguments to Constructors, Destructors, Overloading Constructors, Private Member Functions, Arrays of Objects, Instance and Static Members, Friends of Classes, Copy Constructors, Operator Overloading.

Unit – III

Inheritance: Introduction, Protected Members and Class Access, Base Class Access Specification, Constructors and Destructors in Base and Derived Classes, Polymorphism and Virtual Member Functions, Abstract Base Classes and Pure Virtual Functions, Multiple Inheritance.

C++ Streams: Stream Classes, Unformatted I/O Operations, Formatted I/O Operations.

Unit – IV

Exceptions: Introduction, Throwing an Exception, Handling an Exception, Object-Oriented Exception Handling with Classes, Multiple Exceptions, Re-throwing an Exception.

Templates: Function Templates–Introduction, Function Templates with Multiple Type, Overloading with Function Templates, Class Templates – Introduction, Defining Objects of the Class Template, Class Templates and Inheritance.

Text

Tony Gaddis, Starting out with C++: from control structures through objects (7e)

References

B. Lippman, C++ Primer
Bruce Eckel, Thinking in C++
K.R. Venugopal, Mastering C++
Herbert Schildt, C++: The Complete Reference
BjarneStroustrup, The C++ Programming Language
SouravSahay, Object Oriented Programming with C++

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B.A (C/A) I YEAR
Semester-II
Subject: Computer Applications
Paper- II Programming in C++

Practical **3Hours/Week** **1 credit**

Course Outcome:

1) Creating simple programs using classes and objects in C++.
2) Implement Object Oriented Programming Concepts in C++.
3) Develop applications using stream I/O and file I/O.
4) Implement simple graphical user interfaces.
5) Implement Object Oriented Programs using templates and exceptional handling concepts.

Practical Question Bank

1. Write a program to print the sum of digits of a given number
2. Write a program to check whether the given number is Armstrong or not
3. Write a program to check whether the given string is Palindrome or not
4. Write a program to read student name, roll no, marks and display the same using class and object.
5. Write a program to find area of a rectangle, circle, and square using class and object.
6. Write a program to implement inline function inside and outside of a class for
    a. Finding the area of a square
    b. Finding the area of a cube
7. Write a program to implement friend function and friend class
8. Write a program to implement constructor and destructor with in a class.

9. Write a program to demonstrate hierarchical inheritance.
10. Write a program to demonstrate multiple inheritances.
11. Write a program to demonstrate the constructor overloading.
12. Write a program to demonstrate static polymorphism.
13. Write a program to demonstrate dynamic polymorphism.
14. Write a program to implement polymorphism using pure virtual functions.
15. Write a program to demonstrate the function templates and class templates.
16. Write a program to demonstrate exception handling using try, catch, and finally.

Note: Recommended to use Open Source Software: GCC on Linux; DevC++ (or) CodeBlocks on Windows.

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B.A (C/A) II YEAR
Semester-III
Subject: Computer Applications

Theory **4 Hours/Week** **4credits**

Course Outcome:

a. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
b. Design ER-models to represent simple database application scenarios
c. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
d. Improve the database design by normalization.
e. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

Syllabus

Unit – I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Advantages and Disadvantages of DBMSs, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of a DBMS.

Relational Model: Introduction, Terminology, Integrity Constraints, Views.

Unit – II

SQL: Introduction, Data Manipulation Language commands, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Joins, EXISTS and NOT EXIST, Combining Result Tables.

SQL: The ISO SQL Data Types, Data Definition Language commands –Creating an Index, Removing an Index, Views–Creating a View, Removing a View, WITH CHECK OPTION, Advantages and Disadvantages of Views.

Unit – III

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

Entity–Relationship Modeling: Entity Types, Relationship Types, Attributes, Keys, Strong and Weak Entity Types, Problems with ER Models–Fan Traps, Chasm Traps.

Enhanced Entity–Relationship Modeling: Specialization/Generalization, Aggregation, and Composition.

Unit – IV

Functional–Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional Dependency.

Normalization: The Purpose of Normalization, Data Redundancy, Functional Dependencies, 1NF, 2NF, 3NF, BCNF.

Transaction Management: Transaction Support–Properties of Transactions, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods.

Text Books:

Text Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e)

Sharon Allen, Evan Terry, Beginning Relational Data Modeling

Reference

Jeffrey A. Hoffer, V. Ramesh, HeikkiTopi, Modern Database Management Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts

Carlos Coronel, Steven Morris, Peter Rob, Database Systems: Design, Implementation, and Management

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B.A (C/A) II YEAR
Semester-III
Subject: Computer Applications

Practical **2 Hours/Week** **1 credit**

Course Outcome:

1) To explain basic database concepts, applications, data models, schemas and instances.
2) To demonstrate the use of constraints and relational algebra operations. IV. Describe the basics of SQL and construct queries using SQL.
3) To emphasize the importance of normalization in databases.
4) To facilitate students in Database design .
5) To familiarize issues of concurrency control and transaction management.

Practical Question Bank

Consider the relational schema for part of the DreamHome case study is:
Branch (branchNo, street, city, postcode)
Staff (staffNo, fName, IName, position, sex, DOB, salary, branchNo)
PropertyForRent (propertyNo, street, city, postcode, type, rooms, rent, ownerNo, staffNo, branchNo)
Client (clientNo, fName, IName, telNo, prefType, maxRent, eMail)
PrivateOwner (ownerNo, fName, IName, address, telNo, eMail, password)
Viewing (clientNo, propertyNo, viewDate, comment)
Registration (clientNo, branchNo, staffNo, dateJoined)

1. Create a database with name "Dream Home" and now create all the tables listed above with constraints.
2. Insert a new row into the table supplying data for all columns.
3. Modify data in the database using UPDATE
4. Delete data from the database using DELETE
5. Changing a table definition using ALTER

6. Removing a table using DROP
7. Removing rows in table using TRUNCATE
8. Create an index and removing an index
9. Practice other standard SQL commands for creating, modifying, displaying data of tables.
10. List full details of all staff.
11. List all staff with a salary greater than £10000.
12. List the property numbers of all properties that have been viewed.
13. Produce a list of salaries for all staff, showing only the staffNo, fName, IName, and salary details.
14. List all cities where there is either a branch office or a property for rent.
15. List all cities where there is a branch office but no properties for rent.
16. List all cities where there is both a branch office and at least one property for rent.
17. List the names and comments of all clients who have viewed a property for rent.
18. Produce a status report on property viewings.
19. List complete details of all staff who work at the branch in Glasgow.
20. List the addresses of all branch offices in London or Glasgow.
21. List all staff with a salary between £20,000 and £30,000.
22. Identify all clients who have viewed all properties with three rooms.
23. How many properties cost more than £350 per month to rent?
24. How many different properties were viewed in May 2013?
25. Find the total number of Managers and the sum of their salaries.
26. Find the minimum, maximum and average staff salary.
27. Find the number of staff working in each branch and the sum of their salaries.
28. List all managers and supervisors.
29. Find all owners with the string ‘Glasgow’ in their address.
30. List the details of all viewings on property PG4 where a comment has not been supplied.
31. Produce a list of salaries for all staff, arranged in descending order of salary.
32. Produce an abbreviated list of properties arranged in order of property type.

33. Find the number of staff working in each branch and the sum of their salaries.

34. For each branch office with more than one member of staff, find the number of staff working in each branch and the sum of their salaries.

35. List the staff who work in the branch at '163 Main St'.

36. List all staff whose salary is greater than the average salary, and show by how much their salary is greater than the average.

37. List the properties that are handled by staff who work in the branch at '163 Main St'.

38. Find all staff whose salary is larger than the salary of at least one member of staff at branch B003.

39. Find all staff whose salary is larger than the salary of every member of staff at branch B003

40. List the names of all clients who have viewed a property, along with any comments supplied.

41. For each branch office, list the staff numbers and names of staff who manage properties and the properties that they manage.

42. For each branch, list the staff numbers and names of staff who manage properties, including the city in which the branch is located and the properties that the staff manage.

43. Find the number of properties handled by each staff member, along with the branch number of the member of staff.

44. List all branch offices and any properties that are in the same city.

45. List all properties and any branch offices that are in the same city.

46. List the branch offices and properties that are in the same city along with any unmatched branches or properties.

47. Find all staff who work in a London branch office.

48. Construct a list of all cities where there is either a branch office or a property.

49. Construct a list of all cities where there is both a branch office and a property.

50. Create a view so that the manager at branch B003 can see the details only for staff who work in his or her branch office.

51. Create a view of the staff details at branch B003 that excludes salary information, so that only managers can access the salary details for staff who work at their branch.

52. Create a view of staff who manage properties for rent, which includes the branch number they work at, their staff number, and the number of properties they manage.

53. Removing a view using DROP VIEW

54. Give the user with authorization identifier Manager all privileges on the Staff table.

55. Give users Personnel and Director the privileges SELECT and UPDATE on column salary of the Staff table.

56. Revoke the privilege SELECT on the Branch table from all users.

57. Revoke all privileges you have given to Director on the Staff table.

58. Demonstrate exceptions in PL/SQL

59. Demonstrate cursors in PL/SQL

60. Write PL/SQL queries to create procedures.

61. Write PL/SQL queries to create functions.

62. Write PL/SQL queries to create package.

63. Write PL/SQL queries to create triggers.

64. Write PL/SQL queries using recursion.

65. Create a database with name "Hotel" and now create all the tables listed above with constraints.

66. Insert a new row into the table supplying data for all columns.

67. Modify data in the database using UPDATE

68. Delete data from the database using DELETE

69. Changing a table definition using ALTER

70. Removing a table using DROP

71. Removing rows in table using TRUNCATE

72. Practice other standard SQL commands for creating, modifying, displaying data of tables.

73. List full details of all hotels.

74. List full details of all hotels in London.

75. List the names and addresses of all guests living in London, alphabetically ordered by name.

76. List all double or family rooms with a price below £40.00 per night, in ascending order of price.

77. List the bookings for which no dateTo has been specified.

78. How many hotels are there?

79. What is the average price of a room?

80. What is the total revenue per night from all double rooms?

81. How many different guests have made bookings for August?

82. List the price and type of all rooms at the Grosvenor Hotel.

83. List all guests currently staying at the Grosvenor Hotel.

84. List the details of all rooms at the Grosvenor Hotel, including the name of the guest staying in the room, if the room is occupied.

85. What is the total income from bookings for the Grosvenor Hotel today?

86. List the rooms that are currently unoccupied at the Grosvenor Hotel.

87. What is the lost income from unoccupied rooms at the Grosvenor Hotel?

88. List the number of rooms in each hotel.

89. List the number of rooms in each hotel in London.

90. What is the average number of bookings for each hotel in August?

91. What is the most commonly booked room type for each hotel in London?

92. What is the lost income from unoccupied rooms at each hotel today?

93. Insert rows into each of these tables.

94. Update the price of all rooms by 5%.

95. Investigate the SQL dialect on any DBMS that you are currently using. Determine the system's compliance with the DML statements of the ISO standard. Investigate the functionality of any extensions that the DBMS supports. Are there any functions not supported?

96. Demonstrate that queries written using the UNION operator can be rewritten using the OR operator to produce the same result.

97. Apply the syntax for inserting data into a table.

98. Create a view containing the cheapest hotels in the world.

99. Create the Hotel table using the integrity enhancement features of SQL.

100. Create a database trigger for the following situations:

(a) The price of all double rooms must be greater than £100.

(b) The price of double rooms must be greater than the price of the highest single room.

(c) A booking cannot be for a hotel room that is already booked for any of the specified dates.

(d) A guest cannot make two bookings with overlapping dates.

(e) Maintain an audit table with the names and addresses of all guests who make bookings for hotels in London (do not store duplicate guest detail

Government Degree College for Women Begumpet, Hyderabad-500016
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B.Sc II Year Examination
Semester – III
Subject: Computer Science
Paper- Python – 1 (SEC-I)
Syllabus

Theory **2 Hours/Week** **2 credits**

Course Outcome:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python.
3. To develop the skill of designing Graphical user Interfaces in Python .
4. To develop the ability to write database applications in Python.

Syllabus

Unit – I

Introduction to Python Programming: How a Program Works, Using Python, Program Development Cycle, Input, Processing, and Output, Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Operators, Type conversions, Expressions.

Decision Structures and Boolean Logic: if, if-else, if-elif-else Statements, Nested Decision Structures, Comparing Strings, Logical Operators, Boolean Variables.

Repetition Structures: Introduction, while loop, for loop, Nested Loops.

Unit – II

Functions: Introduction, Defining and Calling a Void Function, Designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions- Generating Random Numbers, Writing Our Own Value-Returning Functions, The math Module, Storing Functions inModules.

File and Exceptions: Introduction to File Input and Output, Using Loops to Process Files, Processing Records, Exceptions.

Text Tony Gaddis, Starting Out With Python(3e)

References

1. Kenneth A. Lambert, Fundamentals of Python
2. Clinton W. Brownley, Foundations for Analytics with Python
3. JamesPayne,BeginningPythonusingPython2.6andPython

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B.A (C/A) III YEAR
Semester-IV
Subject: Computer Applications
Paper- IV(Multimedia Systems)

Theory **3 Hours/Week** **3 credits**

Course Outcomes:

1) Student will develop multimedia skills understanding the principal players of individual players in multimedia teams in developing projects.
2) Students will work with all aspects of images.
3) Students will work with all aspects of sound.
4) Students will work with all aspects of video.
5) Students will learn copyright laws associated with multimedia.
6) Students will learn the cost involved in multimedia planning, designing, and producing.
7) Students will learn ways to present their multimedia projects.

Syllabus

Unit – I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality;

Text: Meaning, Fonts and Faces, Using Text in Multimedia, Computers and Text, Font Editing and Design Tools, Hypermedia and Hypertext.

Unit – II

Images: Making Still Images, Color.
Sound: The Power of Sound, Digital Audio, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Audio File Formats.

Unit – III

Animation: The Power of Motion, Principles of Animation, Making Animations.
Video: Using Video, Digital Video Containers, Shooting and Editing Video.
Making Multimedia: The Stages of a Multimedia Project, the Intangibles, Hardware, Software.

Unit – IV

The Internet and Multimedia: Internetworking, Multimedia on the Web.
Designing for the World Wide Web: Developing for the Web, Text for the Web, Images for the Web, Sound for the Web.

Text	Tay Vaughan, *Multimedia: Making it work (8e)*
	Keyes, *Multimedia Handbook*
References	K. Andleigh, K. Thakkar, *Multimedia System Design*
	Ralf Steinmetz, KlaraNaharstedt, *Multimedia: Computing, Communications Applications*

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B.A (C/A) III YEAR
Semester-IV
Subject: Computer Applications
Paper- IV (Multimedia Systems)

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. Identify the basic tools and components of a multimedia project.

2. Apply basic elements and principles of photo editing software to achieve a great photo effect by applying effects like color, shadows, alteration of backgrounds, cropping and collage making.

3. Create simple shapes using animation editing software and design simple animation by applying shape tweens and motion tweens.

4. Prepare and present a multimedia portfolio containing electronic media that demonstrates multimedia and problem-solving skills.

Practical Question Bank

Implement the followings using Blender-

1) Create an animation using the tools panel and the properties panel to draw the following – Line, oval, circle, pencil, brush, lasso tooletc...
2) Create an animation using the tools panel and the properties panel to draw the following – rectangle, square, triangle, diamond, octagon etc...
3) Create an animation using text tool to set the font, size, coloretc.
4) Create an animation using free transform tool that should use followings- Move Objects, Skew Objects, Stretch Objects, RotateObjects,
5) Stretch Objects while maintaining proportion, Rotate Objects after relocating the center dot
6) Create an animation using layers having following features- Insert layer, Delete layer, Guide layer, Masklayer.
7) Modify the document (changing background color etc.)using the following tools Eraser tool, Hand tool, Ink bottle tool, Zoom tool, Paint Bucket tool, Eyedroppertool
8) Create an animation for bus car race in which both starts from the same point and car wins the race.

9) Create an animation for bus car race in which both starts from the same point and bus wins the race.
10) Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).
11) Create an animation in which text gets converted into digits (like hello is85121215).

12) Create an animation having five images having fade-in fade-out effect.

13) Create an scene to show the sunrise (using multiple layers and motion tweening)

14) Create an scene to show the sunset (using multiple layers and motion tweening)

15) Create an animation to show the ripple effect.
16) Create an animation (using Shape tweening and shape hints) for transforming one shape into another.
17) Create an animation for bouncing ball (you may use motion guidelayer).

Note**:** Practical exercises based on concepts listed in theory using Presentation tools in office automation

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B.Sc II Year Examination
Semester – IV
Subject: Computer Science
Paper- Python – 2 (SEC-3)

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1. To acquire programming skills in core Python.
2. To acquire Object Oriented Skills in Python
3. To develop the skill of designing Graphical user Interfaces in Python
4. To develop the ability to write database applications in Python

Syllabus

Unit – I

Lists and Tuples: Sequences, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Processing Lists, Two-Dimensional Lists, Tuples.

Strings: Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings.

Dictionaries and Sets: Dictionaries, Sets, Serializing Objects.

Recursion: Introduction, Problem Solving with Recursion, Examples of Recursive Algorithms.

Unit – II

Object-Oriented Programming: Procedural and Object-Oriented Programming, Classes, Working with Instances, Techniques for Designing Classes, Inheritance, Polymorphism.

GUI Programming: Graphical User Interfaces, Using the tkinter Module, Display text with Label Widgets, Organizing

Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons.

Text Tony Gaddis, Starting Out With Python(3e)

References

1. Kenneth A. Lambert, Fundamentals ofPython
2. Clinton W. Brownley, Foundations for Analytics withPython
3. JamesPayne,BeginningPythonusingPython2.6andPython3
4. Charles Dierach, Introduction to Computer Science usingPython
5. PaulGries,PracticalProgramming:AnIntroductiontoComputerScienceusingPython3

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B.A (C/A) III YEAR
Semester-V
Subject: Computer Applications
Paper- V (Multimedia Systems)

Theory 3 Hours/Week 3 credits

Course Outcomes:

1) Student will develop multimedia skills understanding the principal players of individual players in multimedia teams in developing projects.
2) Students will work with all aspects of images.
3) Students will work with all aspects of sound.
4) Students will work with all aspects of video.
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Syllabus

Unit – I

Multimedia: Introduction, Definitions, Where to Use Multimedia- Multimedia in Business, Schools, Home, Public Places, Virtual Reality;

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B.A (C/A) III YEAR
Semester-V
Subject: Computer Applications
Paper- V (Multimedia Systems)

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1. Identify the basic tools and components of a multimedia project.

2. Apply basic elements and principles of photo editing software to achieve a great photo effect by applying effects like color, shadows, alteration of backgrounds, cropping and collage making.

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Implement the followings using Blender-

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4 Create an animation using free transform tool that should use followings- Move Objects, Skew Objects, Stretch Objects, RotateObjects,
Stretch Objects while maintaining proportion, Rotate Objects after relocating the center dot
5 Create an animation using layers having following features-
Insert layer, Delete layer, Guide layer, Masklayer.
6 Modify the document (changing background color etc.)using the following tools
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7 Create an animation for bus car race in which both starts from the same point and car wins therace.
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10 Create an animation in which text gets converted into digits (like hello is85121215).

11 Create an animation having five images having fade-in fade-out effect.

12 Create an scene to show the sunrise (using multiple layers and motion tweening)

13 Create an scene to show the sunset (using multiple layers and motion tweening)

14 Create an animation to show the ripple effect.

15 Create an animation (using Shape tweening and shape hints) for transforming one shape into another.

16 Create an animation for bouncing ball (you may use motion guidelayer).

Note: Practical exercises based on concepts listed in theory using Presentation tools in office automation

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B.A (C/A) III YEAR
Semester-V
Subject: Computer Applications
Paper- VI (Web Technologies) (Elective-A)

Theory **3 Hours/Week** **3 credits**

Course Outcomes:

1) Students are able to develop a dynamic webpage by the use of java script and Students will be able to connect a java program to a DBMS and perform insert.
2) Students will be able to write a server side java application called Servlet to catch
3) Update and delete operations on DBMS table. Students will be able to write a server side java application called JSP to catch form.
4) Form data sent from client, process it and store it on database. data sent from client and store it on database.

SYLLABUS

UNIT I : Introduction to Internet basics, Client& Server technology, Browsers, Types of Browsers.
Introduction to HTML, HTML commands, Presentational Elements, PhraseElements, Core Elements and Attributes, Text formatting, Text Styles, Lists.

UNIT II :
Images: Adding Images using <IMG> element, Adding Audio and Video to web page
Tables: Introduction to Tables, Nested Tables.
Forms: IntroducingForms, Formcontrols, sending form data to server.

UNIT III :
Frames: Introduction to Frames, <FRAME>element, Creating link between Frames, Nested Frames.
Cascading Style sheets: Introduction to CSS, CSS rules.

CSSProperties: Controlling text, Text Formatting
Text Pseudo Classes, Selectors, Lengths, Links, Lists, Tables, Outlines, Positioning and Layout with CSS.

UNIT IV :

Introduction to Java Script, Java Script in Web pages, Advantages of Java Script, writing Java Script into HTML, Variables, Operators & Expressions in Java Script,

Conditional checking statements, Loops, Functions, Events, Dialog boxes, Built –in- Objects, FormValidation, Java Script Libraries

Text:

Jon Duckett, Beginning HTML, XTML, CSS and JavaScript

References

Chris Bates, Web Programming
M. Srinivasan, Web Technology: Theory and Practice
Achyut S. Godbole, AtulKahate, Web Technologies
Kogent Learning Solutions Inc, Web Technologies Black Book Ralph Moseley and M. T. Savaliya, Developing Web Applications
P.J. Deitel& H.M. Deitel, Internet and World Wide Web How to program.

Government College for Women Begumpet, Hyderabad-500016
(An Autonomous college of Osmania University)
Re-Accredited by NAAC with 'B+' Grade
B.A (C/A) IIIYEAR
Semester-V
Subject: Computer Applications
Paper- VI (Web Technologies) (Elective-A)

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1) Analyze a web page and identify its elements and attributes.
2) Create web pages using XHTML and Cascading Style Sheets.
3) Build dynamic web pages using JavaScript (Client side programming).
4) Create XML documents and Schemas.

Practical Question Bank

1. Write a HTML program using basic text formatting tags, <hn>, <p>, <br>,<pre>.
2. WriteaHTMLprogramusingpresentationalelementtags<b>,<i>,<strike>,<sup>,<sub>,<big>, <small>,<hr>.
3. WriteaHTMLprogramusingphraseelementtags<blockquote>,<cite>,<abbr>,<acronym>,<kbd>, <address>.
4. Write a HTML program using different list types.
5. Write a HTML program using grouping elements and.
6. Write a HTML program using images.
7. Write a HTML program to create your time table.
8. Write a HTML program to create a form using text inputs, password inputs, multiple line text input, buttons, check boxes, radio buttons, select boxes, file select boxes.
9. Write a HTML program to create a frames and links between frames.
10. Write a HTML program to create different types of style sheets.
11. Write a HTML program to create CSS on links, lists, tables and generated content.
12. Write a JavaScript program to calculate area of rectangle using function.
13. Write a JavaScript program using switch case.
14. Write a JavaScript program to print multiplication table of given number using loop.

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SEMESTER-V
B.A (C/A) III Year
Subject: Computer Applications
Paper: Information Technologies (GE-1)

Course Outcomes:

1) To keep track of the latest developments in information technologies
2) To use modern technologies to access, organize, store, manipulate, interpret and present information, and thus to empower them to be more ready for problem solving and creative applications in their respective disciplines using computer-aided means.

SYLLABUS

Unit – I

Introduction to Computers: What is a Computer? Characteristics of Computers, Generations of Computers,
Classification of Computers, Basic Computer Organization, Applications of Computers.
Input and Output Devices: Input Devices, Output Devices, Soft Copy Devices, Hard Copy Devices.
Computer Memory and Processors: introduction, Memory Hierarchy, Processor Registers, Cache Memory,
Primary Memory, Secondary Storage Devices, Hard Disks, Optical Drives, USB Flash Drives, Memory
Cards.

Unit – II

Computer Software: Introduction, Classification of Computer Software, System Software, Applications
Software, Firmware, Middleware, Acquiring Computer Software.
Operating Systems: Introduction, Evolution of OS, Process Management, Memory Management, File
Management, Device Management, Security Management, Command Interpreter, Windows, Linux.

Text: ReemaThareja, Fundamentals of Computers

References

P. K. sinha, Computer Fundamentals
Anita Goel, Computer Fundamentals
V. Rajaraman, Fundamentals of Computers
E. Balagurusamy, Fundamentals of Computers
J. Glenn Brookshear, Dennis Brylow, Computer Science An Overview
Note: Student friendly video lecturers pertaining to this course are available at
http:// spoken-tutorial.org/
Teachers are advised to teach this courses in the computer lab itself, so that the interested students may derive some time to perform few programs their own.

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B.A (C/A) III YEAR
Semester-VI
Subject: Computer Applications
Paper- VII (Mobile Applications)
SYLLABUS

Theory **3 Hours/Week** **3 credits**

Course Outcomes:

1) Explains the basic concepts of Android phone features and capabilities.
2) Understands the basic technologies used by the Android platform.
3) Recognizes the structure of an Android application project. Uses the tools necessary for Android application project.
4) Recognizes the concept of application development for mobile devices.
5) Recognizes mobile computing platforms and mobile computing.
6) Recognizes smart devices.
7) Recognizes mobile development environments.

Syllabus

Unit – I

Introduction to Programming and App Inventor: Introduction, What Is a Computer Program? Introducing App Inventor, Getting Hands-On with App, Tutorial 1-1,1-2,1-3,1-4 Working with Media: Displaying Images, Tutorial2-1,2-2,2-3,Duplicating Blocks and Using Dropdowns, Sounds, Color Blocks, Layout Components, Tutorial 2-7Input, Variables, and Calculations: The Text Box Component, Performing Calculations, Tutorial 3- 1, 3-2,Storing Data with Variables Tutorial 3-3, Creating Blocks with Type blocking, Math Functions.

Unit – II

Decision Blocks and Boolean: Introduction to Decision Blocks, Relational Operators and the if Block, Tutorial 4-1, The if then else Block Tutorial 4-2, A First Look At Comparing Strings, Logical Operators, Tutorial 4-4,Nested Decision Blocks, Tutorial 4-5 The if then else if Block, The Screen's Initialize Event

Unit – III

The ListPickerComponent, The Checkbox Component, Repetition Blocks, Times, and Dates: The NotifierComponent, The while Loop, Tutorial 5-1, The for each Loop Tutorial 5-2, The Clock Component, The Date Picker Component Procedures and Functions.

Unit – IV

Lists -Graphics and Animation: The Canvas Component, Tutorial 9-1, The Ball and Image SpriteComponent, Tutorial 9-2, 9-3,Using the Clock Component to Create Animations Working with Text: Concatenating Strings, Comparing Strings, Trimming a String, Converting Case, Finding a Substring Tutorial 10-3,Replacing substring , Extracting a Substring, Splitting a Substring Text to Speech and Text Messaging.

Text Tony Gaddis, Rebecca Halsey, Starting Out with App Inventor for Android (1e)

References

Mark L. Murphy, Beginning Android
J.F. DiMarzio, Android – A Programmer's Guide
W Frank Ableson, RobiSen, Chris King, Android in Action
Lucas Jordan, Pieter Greyling, Practical Android Projects

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B.A (C/A) III YEAR
Semester-VI
Subject: Computer Applications
Paper- VII (Mobile Applications)

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1) Apply essential Android Programming concepts.
2) Develop various Android applications related to layouts & rich uses interactive interfaces.
3) Develop Android applications related to mobile related server-less database like SQLITE.

Practical Question Bank

1 .Create the Screen for the Hello World App

2 .Develop a mobile app to Create Good Morning Translator App

3. Design a mobile app to change the Screen's Background Image

4. Create a mobile app for layout components and Color Blocks

5 .Design the mobile app for the Kilometer Converter

6 .Create mobile app to calculate Test Average

7. Develop a mobile app to demonstrate Range Checker

8. Develop a mobile app for Grader App

9. Design a mobile app to demonstrate checkbox components

10. Demonstrate a mobile app for while loop

11. Design a mobile app to Calculate Sum of Consecutive Numbers

12. Design a mobile app to create Lights

13 .Design a mobile app to demonstrate lists

14. Design a mobile app to validate an Email Address

15. Design a mobile app to display images of all states and union territories in India

16 .Design a mobile app of your college having college information, features, events and placements

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B.A (C/A) III YEAR
Semester-VIII
Subject: Computer Applications
Paper- VIII (PHP Programming)(Elective-A)

Theory **3 Hours/Week** **3 credits**

Course Outcomes:

1) List the major elements of the PHP & MySQL work and explain why PHP is good for web development.
2) Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.
3) Analyze the basic structure of a PHP web application and be able to install and maintain the web server, compile, and run a simple web application.
4) Learn how databases work and how to design one, as well as how to use phpMyAdmin to work with MySQL.
5) Learn different ways of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data. Connect to SQL Server and other data sources.

Syllabus

Unit – I

Introducing PHP – What is PHP? Why use PHP? Evolution of PHP, Installing PHP, creating your first script. PHP Language Basics – Using variables, Understanding Data Types, Operators and Expressions, Constants.
Decisions and Loops – Making Decisions, Doing Repetitive Tasks with Looping, Mixing Decisions and Looping with HTML. Strings – Creating and Accessing Strings, Searching Strings, Replacing Text with Strings, Dealing with Upper and Lowercase, Formatting Strings.

Unit – II

Arrays – Creating Arrays, Accessing Array Elements, Looping Through Arrays with for-each, Working with Multidimensional Arrays, Manipulating Arrays.
Functions – What is a Function? Why Functions are useful? Calling Functions, Working with Variable
Functions, Writing your own Functions, Writing Recursive Functions.

Unit – III

Objects –Introduction OOP Concepts, Creating Classes and Objects in PHP, Creating and using Properties, Working with Methods, Object Overloading with _get(), _set() and _call(), Using Inheritance to Extend Power of Objects.
Constructors and Destructors, Automatically Loading Class Files, Storing as Strings.
Handling HTML Forms with PHP , Dealing with Multi-Value Fields.

Unit – IV

Working with Files and Directories - Getting Information on Files, Opening and Closing Files, Reading and Writing to Files, Copying, Renaming, and Deleting Files, Working with Directories.
Introducing Databases and SQL – Deciding How to Store Data, Understanding Relational Databases, Setting Up MySQL, A Quick Play with MySQL, Connecting MySQL from PHP.
Retrieving Data from MySQL with PHP .Manipulating MySQL Data with PHP – Inserting, Updating, and Deleting Records.
Text Matt Doyle, Beginning PHP 5.3 (Wrox – Wiley Publishing)

References

Ellie Quigley, PHP and MySQL by Example
Joel Murach, Ray Harris, Murach's PHP and MySQL
Brett McLaughlin, PHP & MySQL: The Missing Manual
Luke Welling, Laura Thomson, PHP and MySQL Web Development
W. Jason Gilmore, Beginning PHP and MySQL From Novice to Professional
Andrew Curioso, Ronald Bradford, Patrick Galbraith, Expert PHP and MySQL

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B.A (C/A) III YEAR
Semester-VI
Subject: Computer Applications
Paper- VIII(PHP Programming) (Elective-A)

Practical **2 Hours/Week** **1 credit**

Course Outcomes:

1) The objective of this course is to provide the necessary knowledge to design and develop dynamic.
2) database-driven web applications using PHP version 5.
3) Students will learn how to connect to any ODBC-compliant database, and perform hands on practice with a MySQL database to create database-driven HTML forms and reports etc.
4) Students also learn how to configure PHP and Apache Web Server. Comprehensive lab exercises provide facilitated hands on practice crucial to develop competence web sites.

Practical Question bank

1. Write a PHP script to find the factorial of a given number.
2. Write a PHP script to find the sum of digits of a given number.
3. Write a PHP script to find whether the given number is a prime or not.
4. Write a PHP script to demonstrate the use of break, continue statements using nested loops.
5. Write a PHP script to display the FiboNAACi sequence with HTML page.
6. Write a PHP script to create a chess board.
7. Write a PHP script using built-in string function like strstr(), strops(), substr_count(), etc...
8. Write a PHP script to transform a string to uppercase, lowercase letters, make a string's first character uppercase.
9. Write a PHP script that inserts a new item in an array in any position.
10. Write a PHP function to check whether all array values are strings or not.
11. Write a PHP script to count number of elements in an array and display a range of array elements.

12.Write a PHP script using a function to display the entered string in reverse.

13. Write a PHP script for creating the FiboNAACi sequence with recursive function.

14. Write a PHP script using pass by value and pass by reference mechanisms in passing arguments to functions.

15. Write a PHP script to demonstrate the inheritance.

16.Write a PHP script to demonstrate the overloading property accesses with _get() and _set().

17. Write a PHP script to demonstrate the use of final classes and final methods.

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SEMESTER-VI
B.A (C/A) III Year
Subject: Computer Applications
Paper: Information Technologies (GE-2)

Theory **2 Hours/Week** **2 credits**

Course Outcomes:

1) Competently use professional skills and knowledge in the systematic development of complex information systems.
2) Apply their skills and knowledge in a professionally responsible manner.
3) Communicate effectively with other computer scientists and the wider global community using a wide range of communication technologies.
4) Undertake research in information technology.

Syllabus

Unit – I

Introduction to Algorithms and Programming Languages: Algorithm, Control Structures, Flowcharts, Pseudo code, Programming Languages, Generations of Programming Languages.
Database Systems: File Oriented Approach, Database Oriented Approach, Database Views, Three-Schema Architecture, Database Models, Components of DBMS, Introduction of SQL Queries.

Unit – II

Computer Networks: Introduction, Connection Media, Data Transmission Mode, Data Multiplexing, Data Switching, Network Topologies, Types of Networks, Networking Devices, OSI Model.
The Internet: Internet Services, Types of Internet Connections, Internet Security.
Emerging Computer Technologies: Distributed Networking, Peer-to-peer Computing, Grid Computing, Cloud Computing, Utility Computing, On0demand Computing, Wireless Network, Bluetooth, Artificial Intelligence.

Text
ReemaThareja, Fundamentals of Computers

Government Degree College for Women Begumpet, Hyderabad-500016
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MODEL PAPER

Time: 2 1/2hr **Max Marks: 60**

SECTION-A

I Short Answer Questions
Answer any Five of the following questions **5x4=20marks**

1. Question from unit -1.
2. Question from unit -1.
3. Question from unit -2.
4. Question from unit -2.
5. Question from unit -3.
6. Question from unit -3.
7. Question from unit -4.
8. Question from unit -4.

SECTION-B

II Essay Questions
Answer all questions choosing any one bit from each question **4x10=40marks**

9. a) Question from unit-1.

(or)

b) Question from unit-1

10. a) Question from unit-2.

(or)

b)Question from unit-2

11. a) Question from unit-3.

(or)

b) Question from unit-3.

12. a) Question from unit-4.

(or)

b) Question from unit-4

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SEC

MODEL PAPER

Time:1hrs **MaxMarks: 40**

SECTION-A

I. Answer any 4 out of 6 questions. **4*4=16**

1. Question from unit -1.
2. Question from unit -1.
3. Question from unit -1.
4. Question from unit -2.
5. Question from unit -2.
6. Question from unit -2.

SECTION-B

II. Answer the following questions. **2x12=24**

1. a) Question from unit-1.

(or)

b) Question from unit-1

2. a) Question from unit-2.

(or)

b) Question from unit-2.

Practical Examinations

1. Practical examinations will be held at the end of each Semester.
2. 50 marks are allotted for the Practical examination consisting of External and Internal Evaluation.
3. Practical Question Bank is prepared & provided to the students from which practicals will be conducted.
4. Practicals shall be conducted in each Semester as per the Syllabus and Time table.

Resolved to accept the above pattern of examination

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
(AUTONOMOUS)

CHOICE BASED CREDIT SYSTEM
(CBCS)

SYLLABUS
For
B.Sc (DATA SCIENCE) I Year

Under Graduate Program

DEPARTMENT OF COMPUTERS

(w.e.f. 2020 - 21)Session

B.Sc. (DATA SCIENCE)

Semester Pattern Syllabus (CBCS) : w. e. f. : Academic Year: 2020-21

Year	Semester	Theory / Practical	Paper Title	Work Load (Hrs/Week)	# Credits	Marks
I	FIRST	**Paper - I (DSC - A)**	**Fundamentals of Information Technology**	**4**	**4**	**100**
		Practical – 1	Fundamentals of Information Technology (Lab)	*3*	*1*	*50*
	SECOND	**Paper - II (DSC - B)**	**Problem solving and Python Programming**	**4**	**4**	**100**
		Practical – 2	Problem solving and Python Programming (Lab)	*3*	*1*	*50*
II	THIRD	**SEC – 1**	**University Specified**	**2**	**2**	**50**
		SEC – 2	**Mini Project**	**2**	**2**	**50**
		Paper - III (DSC - C)	**Data Engineering with Python**	**4**	**4**	**100**
		Practical – 3	Data Engineering with Python (Lab)	*3*	*1*	*50*
	FOURTH	**SEC – 3**	**University Specified**	**2**	**2**	**50**
		SEC – 4	**Mini Project**	**2**	**2**	**50**
		Paper - IV (DSC - D)	**Machine Learning**	**4**	**4**	**100**
		Practical – 4	Machine Learning (Lab)	*3*	*1*	*50*
III	FIFTH	**Paper – V (A) (DSE - A)**	**Natural Language Processing**	***4***	***4***	***100***
		Paper – V (B) (DSE - A)	**No SQL Data Bases**	**4**	**4**	**100**
		Practical – 5(A)	Natural Language Processing (Lab)	*3*	*1*	*50*
		Practical – 5(B)	No SQL Data Bases (Lab)	*3*	*1*	*50*
		Paper VI – GE	*Data Structures and Algorithms*	***4***	***4***	***100***
	SIXTH	**Paper – VII (A) (DSE - B)**	**Big Data**	**4**	**4**	**100**
		Paper- VII (B) (DSE - B)	**Deep Learning**	**4**	**4**	**100**
		Practical – 7(A)	Big Data (Lab)	*3*	*1*	*50*
		Practical – 7(B)	Deep Learning (Lab)	*3*	*1*	*50*
		Paper VIII (Project)	***Major Project***	***4***	***4***	***100***

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program Specific Outcomes:

1. Students will obtain the fundamental and technical concepts.
2. Students will apply design and development principles in the construction of software engineering and systems.
3. Acquire ability to use current techniques, skills and tools for programming practically.
4. Student will develop IT skills though minor projects, major projects and seminars.
5. Student acquires interests in building their career in the field of IT.

SYLLABUS

B.Sc (Data Science) I YEAR

(With effect from batch of students admitted from the academic year 2020-2021 onwards under semester system)

GOVERNMENT DEGREE COLLEGE FOR WOMEN,
BEGUMPET, HYDERABAD

(Autonomous)
Affiliated to Osmania University

B.Sc. I Year I Semester (CBCS) : Data Science Syllabus

Paper – I : **Fundamentals of Information Technology**

[4 HPW :: 4 Credits :: 100 Marks (External:60, Internal:40)]

Objectives:

1. To deal with the basic concepts of computers.
2. To discuss about the computer hardware, its components and basic computer architecture.
3. To understand the basic computer software including the operating system and its concepts.
4. To introduce the software development process
5. To introduce the basic concept of programming

Outcomes:

Students should be able to

1. Identify the components of a computer and their functions.
2. Understand the concept of networking, LAN, Internet, and working of www.
3. Understand the notion of problem solving using computer by programming
4. Understand the notion of Software Project and the Process of software development

Unit-I

Data and Information: Introduction, Types of Data, Simple Model of a Computer, Data Processing Using a Computer, Desktop Computer [Reference 1]

Acquisition of Numbers and Textual Data: Introduction, Input Units, Internal Representation of Numeric Data, Representation of Characters in Computers, Error-Detecting Codes [Reference 1]

Unit-II

Data Storage: Introduction, Storage Cell, Physical Devices Used as Storage Cells, Random Access Memory, Read Only Memory, Secondary Storage, Compact Disk Read Only Memory (CDROM), Archival Store [Reference 1]

Central Processing Unit: Introduction, Structure of a Central Processing Unit, Specifications of a CPU, Interconnection of CPU with Memory and I/O Units, Embedded Processors [Reference 1]

Unit-III

Computer Networks: Introduction, Local Area Network (LAN), Applications of LAN, Wide Area Network (WAN), Internet, Naming Computers Connected to Internet, Future of Internet Technology [Reference 1]

Input Output Devices: Introduction, Keyboard, Video Display Devices, Touch Screen Display, E-Ink Display, Printers, Audio Output [Reference 1]

Computer Software: Introduction, Operating System, Programming Languages, Classification of Programming Languages, Classification of Programming Languages Based on Applications [Reference 1]

Unit-IV

The Software Problem: Cost, Schedule, and Quality, Scale and Change [Reference 2]
Software Processes: Process and Project, Component Software Processes, Software Development Process Models [Reference 2]
Programming Principles and Guidelines: Structured Programming, Information Hiding, Some Programming Practices, Coding Standards [Reference 2]

References

1. V Rajaraman. Introduction to Information Technology, 3rd Edition, PHI Learning Private Limited, 2018
2. Pankaj Jalote. Concise Introduction toSoftware Engineering, Springer

B.Sc. I Year I Semester (CBCS) : Data Science Syllabus

Practical - 1 *:* Fundamentals of Information Technology (Lab)

[2 HPW :: 1 Credit :: 50 Marks]

Objective

The main objective of this laboratory is to familiarize the students with the basic hardware and software in computers

Exercises

1. Assembly and disassembly of a system box and identifying various parts inside the system box to recognize various parts of a typical computer system
2. Assembly and disassembly of peripheral devices- keyboard and mouse and study of their interface cables, connectors and ports.
3. Installation of Operating Systems-Windows and Linux
4. Disk defragmentation using system tool.
5. Procedure of disk partition and its operation (Shrinking, Extending, Delete, Format).
6. Installing and uninstalling of device drivers using control panel.
7. Working practice on windows operating system and Linux operating system: creating file, folder. Copying, moving, deleting file, folder
8. User Account creation and its feature on Windows Operating System and Changing resolution, color, appearances, and Changing System Date and Time.
9. Installation and using various wireless input devices (Keyboard/Mouse/Scanners etc.,)under Windows/Linux.
10. Study of various types of memory chips and various types of hard disk drives, partition and formatting of hard disk.
11. Installation of scanner, modem and network cards in Windows/Linux.
12. Assembly and disassembly of printer, installing a printer, taking test page, and using printer under Windows/Linux.
13. Installation of application software's – Office Automation, Anti-Virus.
14. Demonstrate the usage of Word and Power point in Windows and Linux
15. Configure Internet connection, Email Account creation, reading, writing and sending emails with attachment.

B.Sc. I Year II Semester (CBCS) : Data Science Syllabus

Paper – II : **Problem Solving and Python Programming**

[4 HPW :: 4 Credits :: 100 Marks (External:60, Internal:40)]

Objectives

The main objective is to teach Computational thinking using Python.

- To know the basics of Programming
- To convert an algorithm into a Python program
- To construct Python programs with control structures.
- To structure a Python Program as a set of functions
- To use Python data structures-lists, tuples, dictionaries.
- To do input/output with files in Python.
- To construct Python programs as a set of objects.

Outcomes:

On completion of the course, students will be able to:

1. Develop algorithmic solutions to simple computational problems.
2. Develop and execute simple Python programs.
3. Develop simple Python programs for solving problems.
4. Structure a Python program into functions.
5. Represent compound data using Python lists, tuples, dictionaries.
6. Read and write data from/to files in Python Programs

Unit-I

Introduction to Computing and Problem Solving: Fundamentals of Computing – Computing Devices – Identification of ComputationalProblems – Pseudo Code and Flowcharts – Instructions – Algorithms – Building Blocks of Algorithms.

Introduction to Python Programming: Python Interpreter and InteractiveMode– Variables and Identifiers – Arithmetic Operators – Values and Types – Statements,Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language.

Control Flow Statements: The if, The if…else,The if…elif…else Decision Control Statements, Nested if Statement, The while Loop, The for Loop, The continue and break Statements.

Unit-II

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments.

Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Unit-III

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations andmethods; advanced list processing - list comprehension; Illustrative programs: selection sort,
insertion sort, mergesort, histogram.

Files and exception: text files, reading and writing files, format operator; command line arguments,errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

Unit-IV

Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance The Polymorphism.

Functional Programming: Lambda. Iterators, Generators, List Comprehensions.

References:

1. Introduction to Python Programming. Gowrishankar S., Veena A. CRC Press, Taylor & Francis Group, 2019
2. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist'', 2nd edition,Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/think- python/)

Suggested Reading:

1. Learning To Program With Python. Richard L. Halterman. Copyright © 2011
2. Python for Everybody, Exploring Data Using Python 3. Dr. Charles R. Severance. 2016

B.Sc. I Year II Semester (CBCS) : Data Science Syllabus

Practical - 2 *:* Problem Solving and Python Programming (Lab)

[2 HPW :: 1 Credit :: 50 Marks]

Objective

The main objective of this laboratory is to put into practice computational thinking. The students will be expected to write, compile, run and debug Python programs to demonstrate the usage of

- variables, conditionals and control structures
- functions (both recursive and iterative)
- basic data types as well as compound data structures such as strings, lists, sets, tuples, dictionaries
- object-oriented programming

Installing Python and Setting up the Environment

Python interpreter can be downloaded for Windows/Linux platform using the link below:
https://www.python.org/downloads/windows/

Exercises

I. Programs to demonstrate the usage of operators and conditional statements

1. Write a program that takes two integers as command line arguments and prints the sum of two integers.
2. Program to display the information:
   Your name, Full Address, Mobile Number, College Name, Course Subjects
3. Program to find the largest number among ‘n’ given numbers.
4. Program that reads the URL of a website as input and displays contents of a webpage.

II. Programs to demonstrate usage of control structures

5. Program to find the sum of all prime numbers between 1 and 1000.
6. Program that reads set of integers and displays first and second largest numbers.
7. Program to print the sum of first ‘n’ natural numbers.
8. Program to find the product of two matrices.
9. Program to find the roots of a quadratic equation

III. Programs to demonstrate the usage of Functions and Recursion

10. Write both recursive and non-recursive functions for the following:
    a. To find GCD of two integers
    b. To find the factorial of positive integer
    c. To print FiboNAACi Sequence up to given number ‘n’
    d. To convert decimal number to Binary equivalent

11. Program with a function that accepts two arguments: a list and a number ‘n’. It should display all the numbers in the list that are greater than the given number ‘n’.
12. Program with a function to find how many numbers are divisible by 2, 3,4,5,6 and 7 between 1 to 1000

IV. Programs to demonstrate the usage of String functions

13. Program that accept a string as an argument and return the number of vowels and consonants the string contains.
14. Program that accepts two strings S1, S2, and finds whether they are equal are not.
15. Program to count the number of occurrences of characters in a given string.
16. Program to find whether a given string is palindrome or not

V. Programs to demonstrate the usage of lists, sets, dictionaries, tuples and files.

17. Program with a function that takes two lists L1 and L2 containing integer numbers as parameters. The return value is a single list containing the pair wise sums of the numbers in L1 and L2.
18. Program to read the lists of numbers as L1, print the lists in reverse order without using reverse function.
22. Write a program that combine lists L1 and L2 into a dictionary.
19. Program to find mean, median, mode for the given set of numbers in a list.
20. Program to find all duplicates in the list.
21. Program to o find all the unique elements of a list.
22. Program to find max and min of a given tuple of integers.
23. Program to find union, intersection, difference, symmetric difference of given two sets.
24. Program to display a list of all unique words in a text file
25. Program to read the content of a text file and display it on the screen line wise with a line number followed by a colon
26. Program to analyze the two text files using set operations
27. Write a program to print each line of a file in reverse order.

VI. Programs to demonstrate the usage of Object Oriented Programming

28. Program to implement the inheritance
29. Program to implement the polymorphism

VII. Programs to search and sort the numbers

30. Programs to implement Linear search and Binary search
31. Programs to implement Selection sort, Insertion sort

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD
AUTONOMOUS

Reaccredited with "B^+" Grade by NAAC
CHOICE BASED CREDIT SYSTEM (CBCS)

DEPARTMENT OF CHEMISTRY

SYLLABUS, MODEL PAPERS

AND

CHEMISTRY PO, PSO

2020-2021

Telangana State Council of Higher Education, Govt. of Telangana B.Sc., CBCS Common Core Syllabi for all Universities in Telangana

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc., Chemistry from 2019-2020

FIRST YEAR- SEMESTER I				
CODE	**COURSE TITLE**	**COURSE TYPE**	**HPW**	**CREDITS**
BS 101	Ability Enhancement Compulsory Course AECC-1	ES	2	2
BS 102	English	CC-1A	4	4
BS 103	Second language	CC-2A	4	4
BS 104	Optional I	DSC-1A	4T+3P=7	4+1=5
BS 105	Optional II	DSC-2A	4T+3P=7	4+1=5
BS 106	**Optional III- Chemistry - I**	**DSC-3A**	**4T = 7 3P**	**4 =5 1**
	Laboratory Course – I (Qualitative Analysis - Semi Micro Analysis of Mixtures)			
	Total Credits		**31**	**25**
FIRST YEAR- SEMSTER II				
BS 201	Ability Enhancement Compulsory Course AECC-2	BCS	2	2
BS 202	English	CC-1B	4	4
BS 203	Second language	CC-2B	4	4
BS 204	Optional I	DSC-1B	4T+3P=7	4+1=5
BS 205	Optional II	DSC-2B	4T+3P=7	4+1=5
BS 206	**Optional III- Chemistry - II**	**DSC-3B**	**4T = 7 3P**	**4 =5 1**
	Laboratory Course - II (Quantitative Analysis – Titrations)			
	Total Credits		**31**	**25**
SECOND YEAR- SEMSTER III				
BS 301	i) Safety Rules in Chemistry Laboratory and Lab Reagents ii) Remedial methods for pollution, drinking water and Soil fertility	**SEC-1 SEC-2**	**2 2**	**2 2**
BS 302	English	CC-1C	3	3
BS 303	Second language	CC-2C	3	3
BS 304	Optional I	DSC-1C	4T+3P=7	4+1=5
BS 305	Optional II	DSC-2C	4T+3P=7	4+1=5
BS 306	**Optional III- Chemistry - III**			
	Laboratory Course - III (Synthesis of Organic compounds)	**DSC-3C**	**4T = 7 3P**	**4 =5 1**
	Total Credits		31	**25**

SECOND YEAR- SEMSTER IV				
BS 401	i) Materials and their Applications ii) Chemistry of Cosmetics and Food Processing	**SEC-3** **SEC-4**	**2** **2**	**2** **2**
BS 402	English	CC-1D	3	3
BS 403	Second language	CC-2D	3	3
BS 404	Optional I	DSC-1D	4T+3P=7	4+1=5
BS 405	Optional II	DSC-2D	4T+3P=7	4+1=5
BS 406	**Optional III- Chemistry - IV**	**DSC-3D**	**4T = 7** **3P**	**4 = 5** **1**
	Laboratory Course - IV **(Qualitative Analysis of Organic Compounds)**			
	Total Credits		31	**25**

* AECC: Ability Enhancement Compulsory Course, SEC: Skill Enhancement Course, DSC: Discipline Specific Course, GE: Generic Elective, ES: Environmental Science , BCS : Basic computer skills.

THIRD YEAR- SEMESTER-V				
CODE	COURSE TlTLE	course TYPE	HPW	CREDITS
BS 501	Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals	GE	4	4
BS 502	English	CC-IE	3	3
BS 503	Second language	CC-2E	3	3
BS 504	Optional- I A/B	DSE -IE	-	4+1=5
BS 505	Optional- II A/B	DSE -2E	-	4+1=5
BS 506	Optional- III A/B A. Spectroscopy and Chromatography (or) B. Metallurgy, Dyes and Catalysis	DSE -3E	4T = 7 3P	4 = 5 1
	Laboratory Course -V Experiments in Physical Chemistry-I			
	TOTAL			25

THIRD YEAR- SEMESTER VI				
BS **601**	Project in Chemistry/ Advanced Chemistry			4
BS 602	English	cc-lF	**3**	3
BS 603	Second language	CC-2F	3	3
BS 604	Optional- I A/D	DSE-IF	-	4+1=5
BS 605	Optional- II A/B	DSE -2F	-	4+1=5
BS 606	Optional- III A/B **A. Medicinal Chemistry** (or) **B. Agricultural and Fuel** Chemistry	DSE -3F	4T = 7 3P	**4**
	Laboratory Course -VI Experiments in Physical Chemistry-II			**1**
	TOTAL			25
	TOTAL Credits			150

Programme Outcomes :

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcome (PSO):

- The students will understand the existence of matter in the universe as solids, liquids, and gases which are composed of molecules, atoms and sub atomic particles.
- Students will learn to estimate inorganic salt mixtures and organic compounds both qualitatively and quantitatively using the classical methods of analysis in practical classes.
- Know the fundamental principles of organic/Inorganic /Physical /General chemistry and predict applications of all chemical reactions.
- construct, design, formulate, organise and synthesize new chemical compounds.
- Present a paper in scientific manner.

I B.Sc. Chemistry syllabus

I Semester 60 Hrs (4 H/W)

(Syllabus with effect from 2019-20)

	Unit-I (Inorganic Chemistry)	**15h**

I	**Chemical Bonding**	**8**
II	P-Block Elements	7
	UNIT II Organic Chemistry	**15h**
I	Structural Theory in Organic Chemistry	5
II	Acyclic Hydrocarbons	6
III	Aromatic Hydrocarbons	4
	Unit-III Physical Chemistry	**15h**
I	Atomic structure and elementary quantum mechanics	3
II	Gaseous State	5
III	Liquid State and Solutions	4
IV	Solutions	3
	Unit-IV General Chemistry	**15h**
I	General Principles of Inorganic Qualitative Analysis	6
II	Isomerism	5
III	Solid state Chemistry	4

B. Sc. I Year CHEMISTRY
SEMESTER WISE SYLLABUS

SEMESTER I

Paper – I

Chemistry - I

Unit-I (Inorganic Chemistry) **15 h (1 hr/week)**

S1- I-1. Chemical Bonding **8 h**

Ionic solids- lattice and solvation energy, solubility of ionic solids, Fajan's rule, polarity and polarizability of ions. VSPER Theory - Common hybridization- sp, sp^2, sp^3, sp^3d, sp^3d^2 and sp^3d^3, shapes of molecules. Molecular orbital theory: Shapes and sign convention of atomic orbitals. Modes of bonds. Criteria for orbital overlap. LCAO concept. Pi and Sigma overlapping. Concept of Types of molecular orbitals- bonding, anti-bonding and non- bonding. MOED of Homo nuclear diatomics - H_2, N_2, O_2^-, O_2^{2-}, F_2 (unhybridized diagrams only) and hetero nuclear diatomics CO, CN^-, NO, NO^+ and HF. Bond order, stability and magnetic properties.

S1-I-2. P-Block Elements 1 **7 h**

Group–13: Structure of Diborane and higher Boranes (B_4H_{10} and B_5H_9), Boron nitrogen compounds ($B_3N_3H_6$ and BN) Lewis acid nature of BX_3. Group – 14: Carbides-Classification – ionic, covalent, interstitial – Structures and reactivity. Industrial applications. Silicones – Classification – straight chain, cyclic and cross-linked. Group – 15: Nitrides – Classification – ionic, covalent and interstitial. Reactivity – hydrolysis. Reactions of hydrazine, hydroxyl amine, phosphazenes.

Unit - II (Organic Chemistry) **15h (1 hr/week)**

S1-O-1: Structural Theory in Organic Chemistry **5 h**

Bond polarization: Factors influencing the polarization of covalent bonds, electro negativity – inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance - Mesomeric effect, application to (a) acidity of phenol. (b) acidity of carboxylic acids and basicity of anilines. Stability of carbo cations, carbanions and free radicals. Hyper conjugation and its application to stability of carbonium ions, free radicals and alkenes.

S1-O-2: Acyclic Hydrocarbons **6 h**

Alkanes– Methods of preparation: From Grignard reagent, Kolbe synthesis. Chemical reactivity

- Inert nature, free radical substitution, Halogenation example- reactivity, selectivity and orientation.

Alkenes - Preparation of alkenes (with mechanism) (a) by dehydration of alcohols (b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1, 2 dihalides, Zaitsev's rule. Properties: Anti-addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H_2O, HOX, H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (Anti – Markonikov's addition). Oxidation (cis –

additions) – hydroxylation by $KMnO_4$, OsO_4, Anti addition- per acids (via epoxidation) hydroboration, ozonolysis – location of double bond. Dienes – Types of dienes, reactions of conjugated dienes – 1, 2 and 1,4 addition of HBr to 1,3 – butadiene and Diels – Alder reaction.

Alkynes– Preparation by dehydro halogenation of vicinal dihalides, dehalogenation of tetrahalides. Physical Properties: Chemical reactivity – electrophilic addition of X_2, HX, H_2O (tautomerism), Oxidation

(formation of enediol, 1, 2 diones and carboxylic acids) and reduction (Metal-ammonia reduction, catalytic hydrogenation).

Aromatic Hydrocarbons **4h**

Introduction to aromaticity: Huckel's rule – Benzene, Naphthalene and Anthracene. Reactions - General mechanism of electrophilic substitution, mechanism of nitration, sulphonation and halogenation, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para, and meta directing groups. Ring activating and deactivating groups with examples. Orientation – (i) activating groups: Amino, methoxy and alkyl groups. (ii) Deactivating groups - nitro, nitrile, carbonyl, carboxylic acid, sulphonic acid and halo groups.

Unit – III (Physical Chemistry) **15h (1 hr/week)**

S1-P-1: Atomic structure and elementary quantum mechanics **3 h**

Black body radiation, heat capacities of solids, Rayleigh Jeans law, Planck's radiation law, photoelectric effect, Limitations of classical mechanics, Compton Effect, de Broglie's hypothesis. Heisenberg's uncertainty principle.

S1-P-2: Gaseous State

5 h

Deviation of real gases from ideal behavior. van der Waals equation of state. Critical phenomenon. PV isotherms of real gases, continuity of state. Andrew's isotherms of CO_2. The van der Waal's equation and critical state. Derivation of relationship between critical constants and van der Waal's constants. The law of corresponding states, reduced equation of states. Joule Thomson effect and inversion temperature of a gas. Liquifaction of gases: i) Linde's method based on Joule Thomson effect ii) Claude's method based on adiabatic expansion of a gas.

S1-P-3: Liquid State and Solutions **4 h**

Liquid State

Intermolecular forces, structure of liquids (qualitative description). Structural differences between solids, liquids and gases. Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

Solutions **3 h**

Liquid - liquid mixtures, ideal liquid mixtures**,** Raoult's and Henry's laws. Non ideal systems,

Azeotropes: HCl-H_2O and C_2H_5OH - H_2O systems. Fractional distillation, Partially miscible liquids: Phenol – Water, Trimethyl amine – Water and Nicotine – Water systems.

Unit - IV (General Chemistry) **15h (1 hr/week)**

S1-G-1. General Principles of Inorganic Qualitative Analysis **6 h**

Anion analysis: Theory of sodium carbonate extract,classification and reactions of anions- CO_3^{2-},

Cl^-, Br^-, 4^{2-}, $PO4^{3-}$, BO_3^{3-}, CH_3COO^-, $NO3^-$. Interfering ions. Cation Analysis: Principles involved - Solubility product, common ion effect, general discussion for the separation and identification of group I individual cations (Hg^{2+}, Ag^+, Pb^{2+}) with flow chart and chemical equations. Principle involved in separation of group II & IV cations. General discussion for the separation and identification of group II (Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Sb^{3+}), III (Al^{3+}, Fe^{3+}), IV (Mn^{2+}, Zn^{2+}) individual cations with flow chart and chemical equations. General discussion for the separation and identification of group V individual cations (Ba^{2+}, Sr^{2+}, Ca^{2+}) with flow chart and chemical equations. Theory of flame test. Identification of Group VI cations (Mg^{2+}, NH_4^+).

S1-G-2. Isomerism **5 h**

Isomerism: Definition of isomers. Classification of isomers: Constitutional and Stereoisomers - definition and examples. Constitutional isomers: chain, functional and positional isomers. Stereoisomers: enantiomers and diastereomers – definitions and examples. Representation of stereoisomers – Wedge, Fischer projection, Sawhorse, Newmann formulae.

Conformational analysis: Classification of stereoisomers based on energy. Definition and examples Conformational and configurational isomers. Conformational analysis of ethane, n- butane, 1, 2-dichloroethane,2-chloroethanol .Cyclic compounds: Baeyer's strain theory, Conformational analysis of cyclohexane, Cis-trans isomerism: E-Z-Nomenclature

S1-G-3: Solid state Chemistry **4 h**

Laws of Crystallography: (i) Law of Constancy of interfacial angles (ii) Law of Symmetry- Symmetry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell. Bravais Lattices and Seven Crystal systems (a brief review). X-ray diffraction by crystals; Derivation of Bragg's equation. Determination of structure of NaCl, KCl and CsCl (Bragg's method and Powder method).

References

General reference: B.Sc I Year Chemistry: Semester I, Telugu Academy publication, Hyd

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications 1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001. Chem.
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn.
5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
6. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
7. Textbook of Inorganic Chemistry by R Gopalan.

Unit- II

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by Graham Solomons.
3. Organic Chemistry by Bruice Yuranis Powla.
4. Organic Chemistry by L. G. Wade Jr.
5. Organic Chemistry by M. Jones, Jr
6. Organic Chemistry by John McMurry.
7. Organic Chemistry by Soni.
8. General Organic chemistry by Sachin Kumar Ghosh.
9. Organic Chemistry by C N pillai.

Unit III

1. Principles of physical chemistry by Prutton and Marron.
2. Text Book of Physical Chemistry by Soni and Dharmahara..
3. Text Book of Physical Chemistry by Puri and Sharma.
4. Text Book of Physical Chemistry by K. L. Kapoor.
5. Physical Chemistry through problems by S.K. Dogra.
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone.

Unit IV

1. Qualitative analysis by Welcher and Hahn.
2. Vogel's Qualitative Inorganic Analysis by Svehla.
3. Text Book of Organic Chemistry by Morrison and Boyd.
4. Text Book of Organic Chemistry by Graham Solomons.
5. Text Book of Organic Chemistry by Bruice Yuranis Powla.
6. Text Book of Organic Chemistry by Soni.
7. Text Book of Physical Chemistry by Soni And Dharmahara..
8. Text Book of Physical Chemistry by Puri And Sharma.
9. Text Book of Physical Chemistry by K. L. Kapoor.

B.Sc. Chemistry, I Semester

Unit-I (InorganicChemistry)

1. To predict the atomic structure, chemical bonding, and molecular geometry based on accepted models.
2. Characterize bonding between atoms, molecules, interaction and energetics (ii) hybridization and shapes of atomic, molecular orbitals, bond parameters, bond- distances and energies.
3. Valence bond theory incorporating concepts of hybridization predicting geometry of molecules.
4. Importance of hydrogen bonding, metallic bonding.
5. Predicting structure of molecules
6. Structure, bonding of p block materials and their oxides/compounds.
7. Understanding chemistry of compounds of p block elements and their structures.

UNIT II Organic Chemistry

1. Basic of organic molecules, structure, bonding, reactivity and reaction mechanisms.
2. Aromatic compounds and aromaticity, mechanism of aromatic reactions.
3. Understanding hybridization and geometry of atoms, 3-D structure of organic molecules.
4. Reactivity, stability of organic molecules, structure, stereochemistry.
5. Electrophile, nucleophiles, free radicals, electronegativity, resonance, and intermediates along the reaction pathways.
6. Mechanism of organic reactions (effect of nucleophile/leaving group, solvent), substitution vs. elimination.

Unit-III Physical Chemistry

Atomic theory and its evolution.

Learning scientific theory of atoms, concept of wave function.

1. Familiarization with various states of matter.
2. Physical properties of each state of matter and laws related to describe the states.
3. Understanding Kinetic model of gas and its properties.
4. Behavior of real gases, its deviation from ideal behavior, equation of state, isotherm, and law of corresponding states.
5. Liquid state and its physical properties related to temperature and pressure variation.
6. Properties of liquid as solvent for various household and commercial use.

Unit-IV General Chemistry.

Stereochemistry of organic molecules – conformation and configuration, asymmetric molecules and nomenclature.

3-D structure of organic molecules, identifying chiral centers.

Solids, lattice parameters – its calculation, application of symmetry, solid characteristics of simple salts.

SEMESTER-I

OBJECTIVES

The objective of **B.Sc. Chemistry I** is intended to provide:

- To predict the atomic structure, chemical bonding, and molecular geometry based on accepted models.
- To Characterize bonding between atoms, molecules, interaction and energetics and to know hybridization and shapes of atomic, molecular orbitals, bond parameters, bond- distances and energies.
- To Predict structure of molecules.
- To understand the Basic of organic molecules, structure, bonding, reactivity and reaction mechanisms.
- To understand about the Electrophile, nucleophiles, free radicals, electronegativity, resonance, and intermediates along the reaction pathways.
- To know about atomic theory and its evolution.
- To Familiarization with various states of matter and Physical properties of each state of matter and laws related to describe the states.
- To know lattice parameters ofSolids, and its calculation, application of symmetry, solid characteristics of simple salts.

Course Outcomes:

After the successful completion of the course, students should be able to:

- Differentiate the type of bonds present in the given molecule.
- Identify hybridization, structure of molecule and their bond angles.
- Interpret the Factors responsible for any Organic chemical reaction to take place.
- Identify the composition of matter which is made up of atoms and molecules.
- Describe the characteristics of states of matter and how states of matter are affected by the parameters (Pressure, Volume and Temperature)

Laboratory Course

I Practical (Inorganic Chemistry)

Paper I - Qualitative Analysis - Semi micro analysis of mixtures 45h (3 h / week)

Analysis of two anions (one simple, one interfering) and two cations in the given mixture.

Anions: $CO3^{2-}$, $SO3^{2-}$, S^{2-}, Cl^{-}, Br^{-}, I^{-}, CH_3COO^{-}, $NO3^{-}$, $PO4^{3-}$, $BO3^{3-}$, $SO4^{2-}$. .

Cations: Hg^{2+}, Ag^{+}, Pb^{2+}

Hg^{2+}, Pb^{2+}, Bi^{3+}, Cd^{2+}, Cu^{2+}, $As^{3+/5+}$, $Sb^{3+/5+}$, $Sn^{2+/4+}$

Al^{3+}, Cr^{3+}, Fe^{3+}

Zn^{2+}, Ni^{2+}, Co^{2+}, Mn^{2+}

Ba^{2+}, Sr^{2+}, Ca^{2+}

Mg^{2+}, NH_4^{+}

II. Inorganic quantitative Analysis-Inorganic Preparations

1. Tetraamine Copper (II) Sulphate
2. Potash alum $KAl(SO_4)_2.12H_2O$,

The objective of B.Sc. Chemistry Practical – I is intended to provide:

- Qualitative semimicro analysis of mixtures containing 2 anions and 2 cations.
- Emphasis should be given on understanding of the chemistry of different reactions.
- To get acquainted with basic preparation methods of inorganic metal complexes.

OUTCOMES.

After the successful completion of the course, students should be able to:

- To get adapted with techniques involved in Qualitative semimicro analysis.
- To get acknowledged with various chemical reactions of basic and acidic radicals.
- To get acknowledged withtechniques involved inpreparation methods of inorganic metal complexes.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. 1 YEAR MODEL INTERNAL QUESTION PAPER
Subject: CHEMISTRY
SEMESTER - 1

Time: 1 Hours **Max. Marks: 20**

Section – A

I Short Answer questions
Answer any TWO of the following questions **2x5=10marks**

1. Explain sailent features of L.C.A.O method?
2. What is Diel's-Alder reaction? Give an example?
3. Write a note on de-Broglie's wave theory?
4. What is common ion effect ? Explain?

SECTION-B

II Essay questions
Answer any one question

1X10 = 10 Marks

5. Draw MOED of N_2 and O_2. Explain the bond order, stability and magnetic properties?

(or)

6. Explain Freidel-Craft Alkylation and Freidel-Craft Acylation of benzene with Mechanism?

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. 1 YEAR SEMESTER MODEL QUESTION PAPER
Subject: CHEMISTRY
SEMESTER - 1

Time: 2 Hours **Max. Marks: 60**
Min. Marks: 24

Section – A

I Short Answer questions
Answer any Five of the following questions **5x4=20marks**

5. Explain sailent features of L.C.A.O method?
6. What are carbides? Give the classification?
7. What is Diel's-Alder reaction? Give an example?
8. What is Huckels rule ?Give examples?
9. Write a note on de-Broglie's wave theory?
10. Describe the liquification of gas by lindes method?
11. What is common ion effect ? Explain?
12. Write the conformational isomers of 1,2-dichloroethane?

SECTION-B

II Essay questions
Answer all questions choosing any one bit from each question

4X10 = 40 Marks

9. (a) Draw MOED of N_2 and O_2. Explain the bond order, stability and magnetic properties?
(or)
(b) Write the reactions of Hydrazine and Hydroxylamine?

10. (a) What is inductive effect? Explain the acidic strength of carboxylic acids?
(or)
(b) Explain Freidel-Craft Alkylation and Freidel-Craft Acylation of benzene with Mechanism?

11. (a) Write the derivation of relation between critical constants and vanderwaal's constants?
(or)
(b) What is viscosity of liquid and write the method to determine viscosity?

12. (a) Write a note on Bayer's strain theory? Write the conformational isomers of cyclohexane?
(or)
(b) Derive Bragg's equation. Determine the structure of NaCl, KCl by bragg's method?

Government Degree College for Women, Begumpet, Hyderabad
Autonomous Accredited with "B" Grade by NAAC

Subject-Chemistry

Model Practical Question paper

B.sc I year Time: 3h Semester I Total marks=50marks

Scheme of Evaluation

Total Marks-50 **Time: 3 Hrs**

1.	Brief procedure writing for the Inorganic compounds	10 Marks
2.	Solubility	04 Marks
3.	Flame Test	02 Marks
4.	Identification of two anions and two cations	4x5=20 marks
5.	Report of two anions and two cations	04 Marks
6.	Record	05 Marks
7.	Voice-Viva	05 Marks

Minimum qualifying marks: 20 marks

I B.Sc. Chemistry syllabus

II Semester 60 Hrs (4 H/W)

(Syllabus with effect from 2019-20)

	UNIT-I Inorganic Chemistry	**15h**
I	*p*-Block elements-II	7
II	Chemistry of Zero group elements	2
III	Chemistry of *d*-Block elements	6
	UNIT II Organic Chemistry	**15h**
I	Halogen compounds	4
II	Hydroxy compounds and Ethers	6
III	Carbonyl Compounds	5
	Unit-III Physical Chemistry	**15h**
I	Electrochemistry	15
	Unit-IV General Chemistry	**15h**
I	Theory of Quantitative analysis	6
II	Stereoisomerism	5
III	Dilute Solutions and Collegative properties	4

B.Sc I Yr CHEMISTRY SEMESTER WISE SYLLABUS

SEMESTER II

Paper – II

Chemistry – II

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S2-I-1 P-block Elements -II 7 h

Oxides: Types of oxides (a) Normal- acidic, basic amphoteric and neutral (b) Mixed (b) sub oxide d) peroxide e) superoxide. Structure of oxides of C, N, P, S and Cl - reactivity, thermal stability, hydrolysis.

Oxy acids: Structure and acidic nature of oxyacids of B, C, N, P, S, Cl and I. Redox properties of oxyacids of Nitrogen: HNO_2 (reaction with $FeSO_4$, $KMnO_4$, $K_2Cr_2O_7$), HNO_3 (reaction with H_2S, Cu), HNO_4 (reaction with KBr, Aniline), $H_2N_2O_2$ (reaction with $KMnO_4$). Redox properties of oxyacids of Phosphorus: H_3PO_2 (reaction with $HgCl_2$), H_3PO_3 (reaction with $AgNO_3$, $CuSO_4$) . Redox properties of oxyacids of Sulphur: H_2SO_3 (reaction with $KMnO_4$, $K_2Cr_2O_7$), H_2SO_4 (reaction with Zn, Fe, Cu), $H_2S_2O_3$ (reaction with Cu, Au), H_2SO_5 (reaction with KI, $FeSO_4$), $H_2S_2O_8$ (reaction with $FeSO_4$, KI). Redox properties of oxy acids of Chlorine.

Interhalogens- Classification- general preparation- structures of AB, AB_3, AB_5 and AB_7 type and reactivity.

Pseudohalogens: Comparison with halogens.

S2-I-2: Chemistry of Zero group elements 2 h

Isolation of noble gases, Structure, bonding and reactivity of Xenon compounds – Oxides, Halides and Oxy-halides. Clatherate compounds and Anomalous behaviour of He (II)

S2-I-3: Chemistry of d-block elements 6 h

Characteristics of d-block elements with special reference to electronic configuration, variable valence, ability to form complexes, magnetic properties &catalytic properties. Stability of various oxidation states and standard reduction potentials. Comparative treatment of second and third transition series with their 3d analogues. Study of Ti, Cr and Cu triads. Titanium triad – electronic configuration and reactivity of +3 and +4 states – oxides and halides. Chromium triad – reactivity of +3 and +6 states. Copper triad – reactivity of +1, +2 and +3 states.

Unit - II (Organic Chemistry) **15h(1 hr/week)**

S2-O-1: Halogen compounds **4 h**

Classification: alkyl (primary, secondary, tertiary), aryl, aralkyl, allyl, vinyl, benzyl. Chemical reactivity - reduction, formation of RMgX, Nucleophilic substitution reactions – classification into S_N1 and S_N2. Mechanism and energy profile diagrams of S_N1 and S_N2 reactions. Stereochemistry of S_N2 (Walden Inversion) 2-bromobutane, S_N1 (Racemisation) 1-bromo-1-phenylpropane Structure and reactivity – Ease of hydrolysis - comparison of alkyl, vinyl, allyl, aryl, and benzyl halides.

S2-O-2: Hydroxy compounds and ethers **6 h**

Alcohols: Preaparation: 1°, 2° and 3° alcohols using Griganard reagent, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, $HX/ZnCl_2$ (Lucas reagent), esterification, oxidation with PCC, alk. $KMnO_4$, acidic dichromates, conc. HNO_3 and Oppenauer oxidation (Mechanism).

Phenols: Preparation: (i) from diazonium salts of anilines, (ii) from benzene sulphonic acids and (iii) Cumene hydroperoxide .

Properties: Acidic nature, formation of phenoxide and reaction with R-X, electrophilic substitution; halogenations, Riemer Tiemann reaction (Mechanism), Kolbe reaction (Mechanism), Gattermann-Koch reaction, Azo-coupling reaction, Schotton-Boumann raction, Houben-Hoesch condensation, .

Ethers: Nomenclature, preparation by (a) Williamson's synthesis (b) from alkenes by the action of conc. H_2SO_4. Physical properties – Absence of Hydrogen bonding, insoluble in water, low boiling point. Chemical properties – inert nature, action of conc. H_2SO_4 and HI.

S2-O-3 Carbonyl compounds **5 h**

Preparation of aldehydes & ketones from acid chloride,1,3-dithianes, nitriles and from carboxylic acids. Special methods of preparing aromatic aldehydes and ketones by (a) Oxidation of arenes (b) Hydrolysis of benzal halides Physical properties – absence of Hydrogen bonding. Reactivity of the carbonyl groups in aldehydes and ketones. Chemical reactivity: Addition of (a) $NaHSO_3$ (b) HCN (c) RMgX (d) NH_3 (e) RNH_2 (f) NH_2OH (g) $PhNHNH_2$ (h) 2,4-DNP (Schiff bases). Addition of H_2O to form hydrate , chloral hydrate (stable), addition of alcohols - hemi acetal and acetal formation. Cannizaro reaction. Oxidation reactions – $KMnO_4$ oxidation and auto oxidation, reduction – catalytic hydrogenation, mechanism of Clemmenson's reduction, Wolf-kishner reduction, Meerwein Pondoff Verly reduction. Reduction with LAH, $NaBH_4$.

Unit - III (Physical Chemistry) **15h(1 hr/week)**

S2-P-1: Electrochemistry **15 h**

Electrical transport – conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific and equivalent conductance with dilution. Migration of ions and Kholrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law - its uses and limitations. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf's method for attackable electrodes. Applications of conductivity measurements: Determination of degree of dissociation, determination of Ka of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Electrolytic and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. Electro motive force (EMF) of a cell and its measurement. Computation of EMF. Types of reversible electrodes- the gas electrode, metal-metal ion, metal-insoluble salt and redox electrodes. Electrode reactions, Nernst equation, cell EMF and Single electrode potential, Standard Hydrogen electrode – reference electrodes (calomel electrode) – standard electrode potential, sign conventions, electrochemical series and its significance. Applications of EMF measurements. Calculation of thermodynamic quantities of cell reactions (Gibbs free energy G, Helmholtz free energy and Equilibrium constant K). Determination of pH using hydrogen electrode, glass electrode and quinhydrone electrode. Solubility product of AgCl. Potentiometric titrations.

Unit – IV (General Chemistry) 15 h (1 hr/week)

S2-G-1: Theory of Quantitative Analysis **6 h**

Volumetric Analysis: Introduction, standard solutions, indicators, end point, titration curves, Types of titrations: i) neutralization titration- principle, theory of acid base indicators, titration curves and selection of indicators- strong acid - strong base, strong acid –weak base, weak acid-strong base and weak acid –weak base. Theory of redox titrations - internal(KMnO4) and external indicators – use of diphenylamine and ferroin indicators. Theory of complexometric titrations – use of EBT, Murexide and Fast sulphone black indicators. Role of pH in complexometric titrations. Precipitation titrations – theory of adsorption indicators.

Gravimetric analysis- Introduction, nucleation, precipitation, growth of precipitate, filtration and washing, drying and incineration of precipitate, coprecipitation and post precipitation. Determination of Ni^{2+}

S2-G-2: Stereoisomerism **5 h**

Optical activity: Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and S_n axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans-1,2-dichlorocyclopropane). Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3dibromopentane). D, L configuration – examples. R, S – configuration: Cahn-Ingold-Prelog rules, examples for asymmetric and disymmetric molecules.

S2-G-3: Dilute Solutions & Colligative Properties **4 h**

Dilute Solutions, Colligative Properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis - laws of osmotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point.

References

General reference: B.Sc I Year Chemistry : Semester II, Telugu Academy publication, Hyd

Unit I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications1996.
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn.
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers 2001.
4. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press1989.
5. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
6. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th Edn.
7. Textbook of inorganic chemistry by R Gopalan.

Unit II

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by Graham Solomons.
3. Organic Chemistry by Bruice Yuranis Powla.
4. Organic Chemistry by L. G. Wade Jr.
5. Organic Chemistry by M. Jones, Jr
6. Organic Chemistry by John McMurry.
7. Organic Chemistry by Soni.
8. General Organic chemistry by Sachin Kumar Ghosh.
9. Organic Chemistry by C N pillai

Unit III

1. Physical chemistry by P W Atkins
2. Principles of physical chemistry by Prutton and Marron.
3. Text Book of Physical Chemistry by Soni and Dharmahara.
4. Text Book of Physical Chemistry by Puri and Sharma
5. Text Book of Physical Chemistry by K. L. Kapoor
6. Physical Chemistry through problems by S.K. Dogra.
7. Elements of Physical Chemistry by Lewis and Glasstone.
8. Material science by Kakani & Kakani

Unit IV

1. Vogel's Text Book of Quantitative Analysis by G.H.Jeffery, J.Bassett, J.Mendham and R.C. Denney 5th edn Addison Wesley Longman Inc. 1999.
2. Quantitative Analysis by Day and Underwood Prentice Hall (India) VI Edn..
3. Nano: The Essentials by T. Pradeep, McGraw-Hill Education.

4. Chemistry of nanomaterials: Synthesis, Properties and applications by CNR Rao et.al.
5. Nanostructured Materials and Nanotechnology, edited by Hari Singh Nalwa, Academic Press
6. Practical chemistry by V K Ahluwalia, Sunitha Dhingra and AdarshGulati.

OBJECTIVES OF SEMESTER-II

The objective of **B.Sc. Chemistry II** is intended to provide:

- Structure, bonding of p block materials and their oxides/compounds.
- Understanding chemistry of compounds of p block elements and their structures.
- Transition metals, its stability, color, oxidation states and complexes.
- Familiarization about classes of organic compounds and their methods of preparation and Basic uses of reaction mechanisms.
- Name reactions, uses of various reagents and the mechanism of their action.
- Basic principle of laws of electrochemistry and understanding about chemical cells, electrodes and their functions.
- Stereochemistry of organic molecules – conformation and configuration, asymmetric molecules and nomenclature.
- Partial molar quantities and its attributes.
- Dilute solution and its properties.

Course Outcomes:

After the successful completion of the course, students should be able to:

- To get acquainted with application of VSEPR theory in explaining structure and bonding.
- To interpret nature of compounds of p block elements.
- To understand about the inert nature of Zero group elements, factors responsible for their reactivity and explaining structure and bonding.
- To get acquainted with characteristics of d block elements.
- To understand about the preparations, physical & chemical properties of classes of organic compounds.
- To know the basic principles of electrochemistry and its applications in daily life.
- To understand the nature of dilute solutions and its properties.

Laboratory Course 45hrs (3 h / week)

Paper II- Quantitative Analysis

Analysis Acid - Base titrations

1. Estimation of Carbonate in Washing Soda.
2. Estimation of Bicarbonate in Baking Soda.
3. Estimation of Carbonate and Bicarbonate in the Mixture.
4. Estimation of Alkali content in Antacid using HCl.
5. Estimation of NH_4^+ by back titration

Redox Titrations

1. Determination of Fe(II) using $K_2Cr_2O_7$
2. Determination of Fe(II) using $KMnO_4$ with sodium oxalate as primary standard.

Complexometric Titrations

1. Estimation of Mg^{2+}

Inorganic preparatios

1. Bis (dimethylglyoximato) Nickel(II)
2. Hexammine cobalt(III) Chloride

Objectives of practicals

- The objective of B.Sc. Chemistry Practical - II is intended to provide:
- To get acknowledged with techniques involved in quantitative analysis of products.
- To get acknowledged with techniques involved in Redox titrations and Complexometric titrations.
- To get acknowledged with techniques involved in preparation methods of inorganic metal complexes.

OUTCOMES

- After the successful completion of the course, students should be able to:
- To get adapted with techniques involved in Quantitative analysis of products.
- To get acknowledged with techniques involved in preparation methods of inorganic metal complexes.

Government Degree College for Women, Begumpet, Hyderabad
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I B.Sc II Semester Paper- II (Practicals)
Paper code 203 No. of Credits - 01

Practical Model Question Paper

Duration : 3 Hours Total Marks : 50

I. Write principle, indicator and colour change at end point in the _____ (3M)

II. Estimate the amount in the given following experiments (35M)

III Viva (6M)
IV Record (6M)

GOVERNMENT DEGREE COLLEGE FOR WOMEN

BEGUMPET, HYDERABAD - 16

B.Sc. 1 YEAR MODEL QUESTION PAPER

Subject: CHEMISTRY

SEMESTER - 2

Time: 2 Hours **Max. Marks: 60**

Min. Marks: 24

Section – A

I Answer any Five of the following questions **5x4=20marks**

1. Write a note on amphoteric oxides?
2. Explain the structures of XeF_2 and XeF_4?
3. Compare the reactivirt of allyl, Vinyl halides?
4. Write any two preparation methods of alcohols?
5. Write about Debye-Huckel-Onsagar's equation for strong electrolytes?
6. Explain Nernst equation?
7. What is coprecipitation?
8. Write a note on acid base indicators?

SECTION-B

II Answer all questions choosing any one bit from each question **4X10 = 40 Marks**

9. (a) Explain the magnetic and catalytic properties of transition elements?

(or)

(b) What are polyhalides? Explain the structures of ICl_2^-, ICl_4^-, I_3^-?

10. (a) Write Riemer Tiemann reaction with mechanism?

(or)

(b) Explain Cannizaro reaction with Mechanism?

11. (a) What is transport number?Determine the transport number using Hittorf's Method?

(or)

(b) Write about Standard Hydrogen electrode?

12. (a) Discuss the Cahn-Ingold-Prelog rules, with examples for R, S notationsfor asymmetric and disymmetric molecules.?

(or)

(b) What is Raoults law?Derive a relation between relative lowering of vapor pressure and molar mass of the solute?

II B.Sc. Chemistry syllabus

III Semester 60 Hrs (4 H/W)

(Syllabus with effect from 2019-20)

	UNIT-I Inorganic Chemistry	**15h**
I	Chemistry of f-block elements	5
II	Coordination Compounds-I	6
III	Metal carbonyls and Organometallic Chemistry	4
	UNIT II Organic Chemistry	**15h**
I	Carboxylic acids and derivatives	5
II	Nitrohydrocarbons	3
III	Amines, Cyanides and Isocyanides	7
	Unit-III Physical Chemistry	**15h**
I	Thermodynamics –I	10
II	Thermodynamics –II	5
	Unit-IV General Chemistry	**15h**
I	Evaluation of analytical data	4
II	Carbanions-I	5
III	Phase Rule	6

B.Sc. II Year CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER III
Paper-III

Chemistry - III

Unit-I (Inorganic Chemistry) 15 h (1 hr/week)

S3-I-1: Chemistry of f-block elements: 5 h

Chemistry of Lanthanides**:** Position in periodic table, Electronic structure, oxidation state, ionic and atomic radii- lanthanide contraction- cause and consequences, anomalous behavior of post lanthanides- complexation- type of donor ligands preferred. Magnetic properties- para magnetism. Colour and spectra, f-f transitions –occurrence and separation– ion exchange method, solvent extraction.

Chemistry of actinides- general features – electronic configuration, oxidation state, actinide contraction, colour and complex formation. Comparison with lanthanides.

Additional Inputs: Comparision between f – Block and d-Block elements

S3-I-2: Coordination Compounds-I 6 h

Simple inorganic molecules and coordination complexes. Nomenclature – IUPAC rules,Coordination number, coordination geometries of metal ions, types of ligands. 2. Brief review of Werner's theory,Sidgwick's electronic interpretation and EAN rule and their limitations. (Valence bond theory (VBT) – postulates and application to (a) tetrahedral complexes $[Ni(NH_3)_4]^{2+}$ $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ **(**b) Square planar complexes $[Ni(CN)_4]^{2-}$, $[Cu(NH3)_4]^{2+}$, $[PtCl_4]^{2-}$ (c) Octahedral complexes $[Fe(CN)_6]^{4-}$, $[Fe(CN)_6]^{3-}$ $[FeF_6]^{4-}$, $[Co(NH_3)_6]^{3+}$, $[CoF_6]^{3-.}$ Limitations of VBT. 3. Isomerism in coordination compounds, stereo isomerism – (a)Geometrical isomerism in (i) square planar meta l complexes of the type$[MA_2B_2]$ $[MA_2BC]$ $[M(AB)_2]$ [MABCD] (ii) Octahedral metal complexes of the type $[MA_4B_2]$, $[M(AA)_2B_2]$ $[MA_3B_3]$ using suitable examples, (b) Optical isomerism in (i). Tetrahedral complexes [MABCD] (ii). Octahedral complexes $[M(AA)_2B_2]$, $[M(AA)_3]$ using suitable examples. Structural isomerism: ionization, linkage, coordination ligand isomerism using suitable examples.

Additional Inputs: Hydration isomerism

S3-I-3: Metal carbonyls and Organometallic Chemistry 4 h

Metal carbonyls: Preparation and properties of $Ni(CO)_4$. Structural features of $Ni(CO)_4$, $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$ and $Cr(CO)_6$ -18 valence electron rule.

Definition, nomenclature and classification of organometallic compounds. Methods of preparation, properties and applications of alkyl and aryl compounds of Li, Mg & Al.

Additional Inputs: Structure of $Fe(CO)_5$

Unit - II (Organic Chemistry) **15h (1 hr/week)**

S3-O-1: Carboxylic acids and derivatives **5 h**

Preparation: a) Hydrolysis of Nitriles, amides and esters. b) Carbonation of Grignard reagents. Special methods of preparation of Aromatic Acids - Oxidation of Arenes. Physical properties- hydrogen bonding, dimeric association,. Chemical properties – Reactions involving H, OH and COOH groups -salt formation, anhydride formation, Acid halide formation, Esterification (mechanism) & Amide formation. Reduction of acid to the corresponding primary alcohol - via ester or acid chloride. Degradation of carboxylic acids by Huns Diecker reaction, Schmidt reaction (Decarboxylation). Arndt – Eistert synthesis, Halogenation by Hell – Volhard - Zelensky reaction. Carboxylic acid Derivatives – Hydrolysis nand Amonolysis of acid halides, Acid anhydrides and esters (mechanism of ester hydrolysis by base and acid). Hydrolysis and dehydration of amides.

Additional Inputs: Comparision of acidic strength of carboxylic acid and alcohol

S3-O-2: Nitrohydrocarbons **3 h**

Preparation of Nitroalkanes. Reactivity - halogenation, reaction with HNO_2 (Nitrous acid), Nef reaction, reduction. Aromatic Nitrohydrocarbons: Preparation of Nitrobenzene by Nitration. Physical properties, chemical reactivity –Reduction of Nitrobenzenes in different media.

Additional Inputs: Acidic nature of α-Hydrogen of Nitrohydrocarbons

S3-O-3: Amines, Cyanides and Isocyanides **7 h**

Amines: classification into 1°, 2°, 3° Amines and Quarternary ammonium compounds. Preparative methods – Ammonolysis of alkyl halides, Gabriel synthesis, Hoffman's bromamide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties. Use of amine salts as phase transfer catalysts. Chemical Properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation. Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electophilic substitutions of Aromatic amines – Bromination and Nitration, oxidation of aryl and 3° Amines, diazotisation. Diazonium salts: Preparation with mechanism. Synthetic importance – a) Replacement of diazonium group by – OH, X (Cl)-Sandmeyer and Gatterman reaction, by fluorine (Schiemann's reaction), by iodine, CN, NO_2, H and aryl groups. Coupling Reaction of diazonium salts. i) with phenols ii) with anilines. Reduction to phenyl hydrazines.

Cyanides and isocyanides: Structure. Preparation of cyanides from a) Alkyl halides b) from amides c) from aldoximes. Preparation of isocyanides from Alkyl halides and Amines. Properties of cyanides and isocyanides, a) hydrolysis b) addition of Grignard reagent iii) reduction iv) oxidation.

Additional Inputs: Basic strength of aliphatic amines and aromatic amines

Unit III (Physical Chemistry) **15 h (1 hr/week)**

S3-P-1: Thermodynamics –I **10 h**

A brief review of - Energy, work and heat units, mechanical equivalent of heat, definition of system, surroundings. First law of thermodynamics statement- various forms mathematical expression. Thermodynamic quantities- extensive properties and intensive properties, state function and path

functions. Energy as a state function and exact differential. Work of expansion and heat absorbed as path function.

Expression for work of expansion, sign convention problems on first law. Heat changes at constant pressure and heat changes at constant volume. Enthalpy. Heat capacities at constant pressure and constant volume. Derivation of Cp-Cv = R. Isothermal adiabatic processes. Reversible and irreversible processes. Reversible change and maximum work. Derivation of expression for maximum work for isothermal reversible process. Problems. Internal energy of an ideal gas. Joules experiment. Joule-Thompson coefficient. Adiabatic changes in ideal gas, derivation of equation, PV^{γ}= constant. P-V curves for isothermal and adiabatic processes. Heat of a reaction at constant volume and at constant pressure, relation between ΔH and ΔV. Variation of heat of reaction with temperature. Kirchhoff's equation and problems. Limitations of first law and need for second law. Statement of second law of thermodynamics. Cyclic process. Heat engine, Carnot's theorem, Carnot's cycle. Derivation of efficiency of heat engine. Problems. Thermodynamic scale of temperature.

S3-P-2: Thermodynamics-II **5 h**

Entropy: Definition from Carnot's cycle. Entropy as a state function. Entropy as a measure of disorder. Sign of entropy change for spontaneous and non- spontaneous processes &equilibrium processes. Entropy changes in i) Reversible isothermal process, ii) Reversible adiabatic process, iii) Phase change, iv) Reversible change of state of an ideal gas. Problems. Entropy of mixing of ideal gases. Free energy Gibb's function (G) and Helmholtz'sfunction (A) as thermodynamic quantities. Concept of maximum work and network ΔG as Criteria for spontaneity. Derivation of equation ΔG =ΔH –TΔS. Significance of the equation. Gibbs equations and Maxwell relations. Variation of G with P, V and T.

Unit – IV (General Chemistry) **15 h (1 hr/week)**

S3-G-1 Evaluation of analytical data **4 h**

Significant figures, accuracy and precision. Errors-classification of errors- determinate and indeterminate errors, absolute and relative errors. Problems based on mean, median, range, standard deviation.

Additional Inputs: Gross errors

S3-G-2: Carbanions-I **5 h**

Introduction, acidic nature of α-hydrogens and tautomerism in carbonyl compounds, nitro hydrocarbons, ethyl acetoacetate, diethyl malonate. Terminal alkynes. Stabilty of carbanions Reactions : Aldol reaction, Perkin reaction, Benzoin condensation, haloform reaction, conversion of smaller alkynes to higher alkynes.

Additional Inputs: Acidic nature of α-Hydrogen of different organic compounds

S3-G-3: Phase Rule **6 h**

Statement and meaning of the terms – Phase, Component and Degrees of freedom, Gibb's Phase rule, phase equilibria of one component system – water system. Phase equilibria of two- component system – Solid-Liquid equilibria, simple eutectic –Pb-Ag system, desilverisation of lead. Solid solutions – compound with congruent melting point – Mg-Zn system and incongruent melting point – NaCl-H_2O system.

Additional Inputs: Applications of phase rule

References

General reference: B.Sc II Year Chemistry: Semester III, Telugu Academy publication, Hyd

Unit- I

1. Analytical chemistry by G. L. David Krupadanam, D. Vijaya Prasad, K. Varaprasada Rao, K.L.N. Reddy and C. Sudhakar
2. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications(1996).
3. Concise Inorganic Chemistry by J.D. Lee 3rd edn Van Nostrand Reinhold Company(1977)
4. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
5. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
6. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press(1989).
7. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
8. Textbook of Inorganic Chemistry by R Gopalan(Universities Press(2012)
9. College Practical chemistry by V K Ahluwalia, Sunitha Dhingra and Adarsh Gulati Universities Press (India) Limited(2012)

Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninth edition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. New Age Publishers Pvt Ltd (2008).
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. (2012)
6. Text book of organic chemistry by C N pillai CRC Press (2012)
7. Organic Chemistry by L. G. Wade Jr.
8. Organic Chemistry by M. Jones, Jr
9. Organic Chemistry by John McMurry.

Unit III

1. Principles of physical chemistry by Prutton and Marron. The MacmillanCompany; 4th Edn.(1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand and Sons.(2011)
3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co.(2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Colloidal and surface chemistry , M. Satake, Y. Hayashi, Y.Mido, S.A.Iqbal and
6. M.S.sethi, Discovery Publishing Pvt.Ltd (2014)
7. Material science by Kakani & Kakani, New Age International(2016)
8. Physical Chemistry by Ira Levine (Author) McGraw-Hill Education; 6 edition (May 9, 2008)

Unit IV

1. Text book of organic chemistry by Morrison and Boyd, Person(2009)
2. Text book of organic chemistry by Graham solomons, Wiley(2015)
3. Text book of organic chemistry by Sony, Sultan Chand & Sons; 29th edition (2012)
4. Text book of organic chemistry by Bruice yuranis Powla, (2012)
5. General Organic chemistry by Sachin kumar Ghosh, New Age Publishers Pvt Ltd (2008)

Semeter III Course Objectives

- To learn the sources, importance, separation techniques of lanthanides
- To understand the basics of formation of coordination compounds from various theories
- Learn the preparation and properties of metal carbonyls and organo metallic compounds
- Understand the fundamental properties and reactivity of carboxylic compounds, nitrohydro compounds, amines, cyanides and isocyanides
- Understand the various laws of thermodynamic
- Basics of phase rule, number of components and degrees of freedom, eutectic point, eutectic mixture, Water system, Pb-Ag system, NaCl system and freezing mixtures.
- Evaluation of the analytical data
- Reactions involving active methylene compounds
- Synthesis of various organic compounds

COURSE OUTCOME

Inorganic Chemistry

- Predict the nature of lanthanides and actinides and their influence on the other elements of periodic table
- Analyse the geometry, stability, magnetic properties and isomerism of coordination compounds
- With the basics of 18 valence electron rule, It will help students to predict the stability of metal carbonyls
- Using the knowledge of organo metallic compounds, students can design new synthetic pathways for the synthesis of novel compounds, Hence creating a interest in research and development

Organic Chemistry

- Gains broad knowledge of the preparation and properties of mono, di and unsaturated carboxylic acids with their mechanisms that helps in understanding their importance.
- Reactivity of Nitrogen containing organic compounds and gains the knowledge of preparing various compounds such as dyes

Physical chemistry

- Students will be able to state and apply laws of thermodynamics in predicting the predict the feasibility of a process and extent of yield of the product obtain
- Differentiate between extensive properties and intensive properties, state function and path functions

General Chemistry

- Students will be able to synthesize new compounds from carbon-carbon new bond formation methods learned in carbanions
- Analyse and evaluate the experiment through the analytical data obtained in the observations made
- Use the knowledge of phase rule in the separation of various compounds

Laboratory Course

Paper III (Organic Synthesis) **45 h (3h/week)**

1. Synthesis of Organic compounds:

i. Acetylation: Acetylation of salicylic acid, Benzoylation of Aniline.

ii. Aromatic electrophilic substitution: Nitration: Preparation of nitro benzene and m-dinitro benzene.

iii. Halogenation: Preparation of p-bromo acetanilide, Preparation of 2, 4, 6-tribromo phenol.

iv. Oxidation: Preparation of benzoic acid from benzyl chloride.

v. Esterification: Preparation of n-butyl acetate from acetic acid.

vi. Methylation: Preparation of – β-naphthyl methyl ether.

vii. Condensation: Preparation of benzilidine aniline form Benzaldehyde and aniline.

viii. Diazotisation: Azocoupling of β-Naphthol.

2. Microwave assisted synthesis of Asprin – DEMO (demonstration only)

Outcomes of Practicals

- Will learn and implement the ethics of the laboratory rules while performing the experiments
- Develop the skills of handling various instruments such as distillation units, melting point apparatus etc
- Experimental learning in the preparation of various organic compounds that improves their skills in organic synthesis

Government Degree College for Women, Begumpet, Hyderabad
Autonomous Accredited with "B" Grade by NAAC

II B.Sc Chemistry III Semester Paper- III (Practicals)

Practical Model Question Paper

Duration : 2 Hours Total Marks : 50

1. Write brief Procedure with chemical equation and principle for the preparation of an organic compound. (10M)

2. Prepare and submit the crude sample of organic compound (30M)

3. Record (5M)

4. Viva (5M)

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
AUTONOMOUS

Max marks: 20M **NAAC ACCREDITED "B"**

Time: 1hour **II Year Internal Question Paper** **Invigilator Signature**

Date: **Internal assessment Test No.1**

CHEMISTRY

Paper-III

Name: _____ **Roll No._____**

Class: _____ **Semester: III_____**

SECTION – A

Answer any 2 questions of the following, each question carries 5 marks

2x5=10M

I. 1. Explain the Sidgwick's concept of EAN and Calculate EAN for the following complexes $[Fe(CN)6]^{4-}$ and $[Fe(CN)6]^{3-}$

2. Explain the structure of $Fe(CO)_5$?

3. Write classification of Organo Metallic Compounds (OMC)?

4. What is lanthanide contraction and explain its consequences?

SECTION – B

Answer any one question from the following, each question carries 10 marks

1X10=10M

II. 1. Explain the Valance Bond Theory (VBT) postulates with examples each from tetrahedral complex, square planar complex and octahedral complex?

(OR)

2. Write the preparation of Nitrobenzene with mechanism and reduction of Nitro benzene in different media.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. II YEAR SEMESTER MODEL QUESTION PAPER
Subject: CHEMISTRY
SEMESTER - III

Time: 2 Hours **Max. Marks: 60**
Min. Marks: 24

Section – A

I Short Answer questions
Answer any Five of the following questions **5x4=20marks**

1. Define lanthanides and actinides?
2. Explain EAN rule with one example ?
3. Write Arndt-Eistert synthesis?
4. Write preparation of Nitro hydrocarbons?
5. Explain I law of thermodynamics?
6. Derive equation of Pv^{γ}= constant?
7. Define accuracy and precision.
8. Define phase, component and degrees of freedom?

SECTION-B

II Essay questions
Answer all questions choosing any one bit from each question

4X10 = 40 Marks

9. (a) Explain the Valance Bond Theory (VBT) postulates with examples each from tetrahedral complex, square planar complex and octahedral complex

(or)

(b) Write classification of Organo Metallic Compounds (OMC) with examples?

10. (a) Write the preparation of Nitrobenzene with mechanism and reduction of Nitro benzene in different media.

(or)

(b)Write preparation of amines using Gabriel synthesis, Hoffman's bromamide reaction with mechanism?

11. (a) Derive Cp-Cv = R.

(or)

(b) Explain Carnot's theorem?

12. (a) Write aldol condensation and bezoin condensation reaction?

(or)

(b) explain water system with phase diagram

B.Sc. Chemistry II Year
Semester III
Skill Enhancement Course- I (SEC-I)

301 SEC: Safety Rules in Chemistry Laboratory and Lab Reagents
Unit I: Laboratory Safety Rules and Regulations.

General rules and regulations for lab safety: Minimizing Risks of Hazards , Personal Protective Equipment (PPE) - Hair, Dressing for the Laboratory, Eye Protection, Eye-wash fountain, Gloves, Laboratory Protocols, Labeling Chemicals, Careful reading of labels Prevention of Inhaling Harmful Chemicals, Guide to Chemical Hazards, Chemical Spills etc,. Accidents use of fire extinguisher and first aid kit in the laboratory, safety symbols- Preparation of the charts by the students and display of chats in chemistry labs. Calibration of fractional weights, calibration of glass ware - burette, pipette, standard flask, Normality/Molarity and specific gravity of concentrated acids – Preparation of dilute solutions (Numerical problems). Precautions to be taken in the preparation of dilute acids and bases and bases. Preparation of stock solutions of salts with specific examples. Properties of primary standard salt and preparation of standard solution. Good laboratory practices-maintenance of observation book record.

UNIT 2: Preparation of Lab Reagents: Preparation of indicators and use of indicators in volumetric analysis- acid base titrations, redox titrations, precipitation titrations and complexometric titrations. Role of an indicator in detecting end point (Phenolphthalein, Methyl orange, Methyl-red, Potassium Chromate, Diphenylamine, EBT, Murexide, etc). Preparation of buffers – pH 10 ammonical buffer and acetate buffer solutions. Preparation of commonly used reagents : Ammonium hydroxide solution, Ammonium molybdate reagent, Ammonium hydrogen phosphate solution, Bayer's reagent, Benedict's solution, Bromine water, Dimethyl glyoxime reagent, 2,4-Dinitrophenyl hydrazine reagent, Eriochrome black-T reagent Fehling solution, Ferric chloride solution, Ferrous sulphate solution, Iodine solution, Molisch's reagent, Nessler's reagent, Neutral $FeCl_3$, Schiff's reagent, Silver nitrate solution, Sodium carbonate solution , Sodium hydroxide (Caustic soda) solution, Starch solution, Tollen's reagent.
(reference work and submission of assignments). Charts preparation depicting course content.

RECOMMENDED BOOKS

1. Vogel's Text Book of Quantitative Chemical Analysis, 5th edition.
2. Vogel's Text Book of macro and semimicro qualitative inorganic analysis. G. Svehla, 5th edition.
3. Chemistry Reagent Manual Prepared by Chemistry Department, SGTB Khalsa College under DBT's Star College Scheme, University of Delhi (Available: online)
4. American Chemical Society Safety in Academic Chemistry Laboratories 8th edition.

[Course objectives (CO)]

- To improve the skills of students in the application of theory and practical knowledge.
- To fill the gap between theory and practicals.
- To train the students in understanding laboratory safety rules and to improve the skills in
- preparation of laboratory reagents]

B.Sc. Chemistry II Year
Semester III
Skill Enhancement Course- II (SEC –II) (2 Credits)

REMEDIAL METHODS FOR POLLUTION, DRINKING WATER AND SOIL FERTILITY STANDARDS

UNIT I: Remedial Methods for Pollution Prevention and control of air pollution 15 h (1 hr/week)

Ozone hole-causes and harm due to ozone depletion. The effect of CFC's in Ozone depletion and their replacements. Global Warming and Greenhouse Effect Precautions to control global warming. Deleterious effect of pollutants - Endangered Monuments- acid rain. Precautions to protect monuments. Sources of Radiation pollution - Chernobyl accident and its Consequences. Radiation effect by the usage of cell phones and protection tips. Deleterious effects of cell phone towers and health hazards.

Sources of water pollution-(i). Pollution due to pesticides and inorganic chemicals, (ii). Thermal pollution (iii). Ground water pollution (iv). Eutrophication.

Methods for control of water pollution and water recycling. Dumping of plastics in rivers & oceans and their effect on aquatic life. Determination of (i) Dissolved Oxygen and (ii) Chemical Oxygen Demand in polluted water - Illustration through charts (or) demonstration of experiments. Sources of soil pollution (i). Plastic bags, (ii). Industrial and (iii). Agricultural sources. Control of soil pollution. Environmental laws in India. Environmental benefits of planting trees.

UNIT II: Drinking Water and Soil Fertility Standards and Analysis 15 h (1 hr/week)

Water Quality and Common Treatments for Private Drinking Water Systems: Drinking Water Standards-Primary Drinking Water Standards : Inorganics, Organics and Volatile Organic Chemicals. Secondary Drinking Water Standards-Inorganics and Physical Problems. Water Testing, Mineral Analysis, Microbiological Tests, Pesticide and Other Organic Chemical Tests. Principle involved in Water Treatment Techniques. (i) Reverse osmosis (ii) Disinfection methods such as chlorination, ultraviolet light, ozonation etc (iii) Chemical oxidation and (iv) Ion exchange (water softeners). Visit to nearby drinking water plants and interaction at sites.

Introduction to Soil Chemistry- Basic Concepts. Effect of pH on nutrient availability. Macronutrients and their effect on plants -Carbon, Hydrogen, Oxygen, Nitrogen and Phosphorus other macronutrients-Calcium, Magnesium and Sulfur. Micronutrients and their effect on plants. Boron ($B_4O_7^{2-}$), Copper (Cu^{2+}), Iron (Fe^{2+}, Fe^{3+}) Manganese (Mn^{2+}) Molybdenum (MoO_4^{2-}) Zinc (Zn^{2+}) Cobalt (Co^{2+}) Chlorine (Cl^-) and Others. Determination of soil nitrogen by Kjeldahl method- Illustration through charts (Or) demonstration of experiment. Visit to nearby agricultural forms and interaction with farmers. Discussion with farmers on the use of Soil Analysis Kits.

References

1. A Text book for 'Remedial methods for pollution, drinking water and soil fertility standards', First Edition, Authors: Dr Mudvath Ravi, Gopu Srinivas, Putta Venkat Reddy, Vuradi Ravi Kumar,

Battini Ushaiah, ISBN No. 978-93-5311-183-0.
2. Remedial methods for pollution, drinking water and soil fertility standards, Author: Dr G. Vanjatha.
3. Remedial methods for pollution, drinking water and soil fertility standards, Telugu version, Authors: Dr N. Yogi Babu, Dr. G. Vanajatha, M. Srilatha.
4. Environmental Pollution, download.nos.org/333courseE/10.pdf
5. CFC Replacements, butane.chem.uiuc.edu/pshapley/Environmental/L21/3.html
6. Effects of Acid Rain on Buildings www.air-quality.org.uk/12.php
7. Acid Rain Effects - Buildings - Chemistry chemistry.elmhurst.edu/vchembook/196buildings.html 8. How to protect national heritage - ways to protect monuments www.youthkiawaaz.com/2011/03/how-to-protect-national-heritage/.
9. Chernobyl nuclear power plant accident - NRC www.nrc.gov/reading-rm/doc- collections/fact-sheets/chernobyl-bg.pdf
10. Side-effects of harmful radiation from mobile phones and towers pib.nic.in/newsite/printrelease.aspx?relid=116304
11. Cell Phone Radiation Protection - Highly Effective Tips https: www.electricsense.com/775/how-to-protect-yourself-from-cell-phone-radiation/
12. Chemical Waste That Impact on Aquatic Life or Water Quality blog.idrenvironmental.com/chemical-waste-that-impact-on-aquatic-life-or-waterquality
13. Trees and Your Environment - Clean Air Gardening www.cleanairgardening.com/plantingtrees 14.water quality and common treatments for private drinking water . extension.uga.edu/publications/detail.html?number=b939
15. Soil chemistry https://casfs.ucsc.edu/about/publications/Teaching-Organic- Farming/PDFdownloads/2.2-soil-chemistry.pdf
16. Soil Analysis-Determination of Available Nitrogen ... - Amrita VirtualLab vlab.amrita.edu/?sub=2&brch=294&sim=1551&cnt=1
17. Determination of dissolved oxygen (DO) www.cutm.ac.in/pdf/env%20engg%20lab%20manual.pdf 18. Determination of chemical oxygen demand of wastewater www.pharmaguideline.com › quality control ›

COURSE OBJECTIVES:

- To Understand chemistry involved in environment
- To Identify the chemical reactions and changes in contaminants
- Imparts knowledge on essential nutrients, soil fertility, nutrient transformations in soil.
- To assess the water demand of area under consideration
- To plan and design water supply system
- Understand impact of human action on soil and land.
- To learn significance of water quality and its importance for living being including humans.

COURSE OUTCOMES:

- Enhance the ability to apply this knowledge and proficiency to find solutions relating to environmental concerns of varied dimensions of present times.
- Students gain Knowledge of water sources and processes involved and Application of knowledge on water resource technology
- To get acquaint in Understand the Indian constitutional provisions with respect to the environmental protection, division of powers, and fundamental rights
- Students Understand impact of human action on soil and land
- Apply the gained knowledge to practical situations particularly in agriculture.
- Ability to respond flexibly towards restoration of problematic soils of specific areas.
- Able to do sampling and analysis of air pollutant Develop an understanding of working of air pollution control devices
- Students will gain knowledge on concepts and principles of Soil fertilizes.

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET
AUTONOMOUS
NAAC ACCREDITED "B"

Max marks: 40M
Time: 1 1/2hour **Invigilator Signature**
Date: **SEC Model Paper**

Name: _____ **Roll No._____**
Class: _____ **Semester: _III_____**

. **SECTION-A**

Answer any 4 questions from the following, each question carries 4 marks **4x4=16M**

1.UNIT -1

2. UNIT -1

3. UNIT -1

4. UNIT -2

5. .UNIT -2

6. .UNIT -2

SECTION-B

Answer all questions, each question carries 12 marks **12x2=24M**

7. UNIT -1

8. UNIT -2

II B.Sc. Chemistry syllabus

Iv Semester 60 Hrs (4 H/W)

(Syllabus with effect from 2019-20)

	UNIT-I Inorganic Chemistry	**15h**
I	**Coordination Compounds –II**	11
II	**Bioinorganic Chemistry**	4
III	Metal carbonyls and Organometallic Chemistry	4
	UNIT II Organic Chemistry	**15h**
I	**Carbohydrates**	6
II	**Amino acids and proteins**	5
III	**Heterocyclic Compounds**	4
	Unit-III Physical Chemistry	**15h**
I	**Chemical Kinetics**	11
II	**Photochemistry**	4
	Unit-IV General Chemistry	**15h**
I	**Theories of bonding in metals**	4
II	**Carbanions-II**	5
III	**Colloids & Surface Chemistry**	6

B.Sc. II yr CHEMISTRY

SEMESTER IV Paper-IV

Chemistry - IV

Unit-I (Inorganic Chemistry) 15h (1 h/week)

S4-I-1: Coordination Compounds –II 11 h

Crystal field theory (CFT)- Postulates of CFT, splitting patterns of d-orbitals in octahedral, tetrahedral, square planer with suitable examples. Crystalfield stabilization energies and its calculations for various dn configurations in octahedral complexes. High Spin Low Spin complexes. Colour and Magnetic properties of transition metal complexes. Calculations of magnetic moments spin only formula. Detection of complex formation - basic principles of various methods- change in chemical properties, solubility, colour, pH, conductivity, magnetic susceptibility.

Hard and soft acids bases (HSAB) - Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of reaction. Thermodynamic and kinetic stability of transition of metal complexes. Stability of metal complexes –stepwise and overall stability constant and their relationship and chelate effect determination of composition of complex by Job's method and mole ratio method.

Applications of coordination compounds: Applications of coordination compounds a) in quantitative and qualitative analysis with suitable examples b) in medicine for removal of toxic metal ions and cancer therapy c) in industry as catalysts polymerization – Ziegler Natta catalyst d) water softening.

Additional Input: Spectrochemical Series

S4-I-2:Bioinorganic Chemistry 4 h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl-). Toxic metal ions As, Hg & Pb Oxygen transport and storage – structure of hemoglobin, binding and transport of oxygen. Fixation of CO2 in photosynthesis- overview of light and dark reactions in photosynthesis. Structure of chlorophyll and coordination of magnesium. Electron transport in light reactions from water to NADP+ (Z – scheme).

Additional Input: Toxicity of Sn

Unit - II (Organic Chemistry) 15h(1 hr/week)

S4-O-1: Carbohydrates 6 h

Introduction: Classification and nomenclature. Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure. Number of optically active, isomers possible for the structure, configuration of glucose based on D-glyceraldehyde as primary standard (No proof for configuration is required). Evidence for cyclic structure of glucose (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 – ketohexose structure. Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure,Haworth formula).

Inter Conversion of Monosaccharides: : Arabinose to D-glucose, D- mannose (kiliani – Fischer method). Epimers, Epimerisation- Lobry de bruyn van Ekenstein rearrangement. D-glucose to D-arabinose by Ruff's degradation. Aldohexose(+) (glucose) to ketohexose (–) (fructose) and Ketohexose(Fructose) to aldohexose (Glucose).
Additional Input: Difference between glucose and fructose

S4-O-2: Amino acids and proteins 5 h
Classification. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples – Glycine, Alanine, Valine and Leucine) by following methods: a) From halogenated Carboxylic acid b)Malonic ester synthesis c) strecker's synthesis. Physical properties: Optical activity of naturally occurring amino acids. Zwitter ion structure – salt like character, definition of isoelectric point. Chemical properties: General reactions due to amino and carboxyl groups – Lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides. Primary structure of proteins, di peptide synthesis
Additional Input: strecker's synthesis mechanism

S4-O-3: Heterocyclic Compounds 4 h
Introduction and definition: 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring systems –Numbering. Aromatic character
Resonance structures: Explanation of feebly acidic character of pyrrole, electrophillic substitution, Halogenation, Nitration and Sulphonation. Reactivity of furan as 1,3-diene, Diels Alder reactions (one example). Sulphonation of thiophene purification of Benzene obtained from coal tar). Preparation of furan, Pyrrole and thiophene Paul-Knorr synthesis. Structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – preparation by Hantsch method and properties – Reactivity towards Nucleophilic substitution reaction – chichibabin reaction.
Additional Input: Nomenclature of heterocyclic compounds

Unit III (Physical Chemistry) 15h (1 hr/week)

S4-P-1: Chemical Kinetics 11 h
Introduction to chemical kinetics, rate of reaction, variation of concentration with time, rate laws and rate constant. Specific reaction rate. Factors influencing reaction rates: effect of concentration of reactants, effect of temperature, effect of pressure, effect of reaction medium, effect of radiation, effect of catalyst with simple examples. Order of a reaction.
First order reaction, derivation of equation for rate constant. Characteristics of first order reaction. Units for rate constant. Half- life period, graph of first order reaction, Examples-
Decomposition of H2O2 and decomposition of oxalic acid, Problems.
Pseudo first order reaction, Hydrolysis of methyl acetate, inversion of cane sugar, problems. Second order reaction, derivation of expression for second order rate constant, examples-16. Saponification of ester, $2O_3 \rightarrow 3O_2$, $C_2H_4+H_2 \rightarrow C_2H_6$. Characteristics of second order reaction, units for rate constants, half- life period and second order plots. Problems
Additional Input: Zero order reaction

S4-P-2: Photochemistry 4 h

Introduction to photochemical reactions, Difference between thermal and photochemical reactions, Laws of photo chemistry- Grotthus Draper law, Stark–Einstein's Law of photochemical equivalence. Quantum yield. Examples of photo chemical reactions with different quantum yields. Photo chemical combinations of H_2–$Cl_2$and H_2–Br_2 reactions, reasons for the high and low quantum yield. Problems based on quantum efficiency. Consequences of light absorption. Singlet and triplet states. Jablonski diagram. Explanation of internal conversion, inter- system crossing, phosphorescence, fluorescence.

Additional Input: Chemiluminescence

Unit IV (General Chemistry) 15h (1 hr/week)

S4-G-1: Theories of bonding in metals 4 h

Valence bond theory, Explanation of metallic properties and its limitations, Free electron theory, thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors n-type and p-type, extrinsic & intrinsic semiconductors, and insulators.

S4-G-2: Carbanions-II 5 h

Mannich reaction , Michael addition and Knoevengeal condensation Synthetic applications of Aceto acetic ester. Acid hydrolysis and ketonic hydrolysis: Preparation of ketones, monocarboxylic acids and dicarboxylic acids Malonic ester– synthetic applications. Preparation of (i) substituted mono carboxylic acids and (ii) substituted dicarboxylic acids.

Additional Input: Michael addition mechanism

S4-G-3: Colloids & Surface Chemistry 6 h

Definition of colloids. Classification of colloids. Solids in liquids (sols): preparations and properties – Kinetic, Optical and Electrical stability of colloids. Protective action. Hardy–Schultz law, Gold number. Liquids in liquids (emulsions): Types of emulsions, preparation and emulsifier. Liquids in solids(gels): Classification, preparations and properties, General applications of colloids.

Adsorption: Types of adsorption. Factors influencing adsorption. Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm. Applications.

References

General reference: B.Sc II Year Chemistry : Semester IV, Telugu Academy publication, Hyd

Unit- I

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications (1996).
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn. Van Nostrand ReinholdCompany(1977)
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)

5. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press(1989).
6. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press (1999).
7. Textbook of Inorganic Chemistry by R Gopalan, Universities Press,(2012)

Unit- II

1. Text book of organic chemistry by Soni. Sultan Chand & Sons; Twenty Ninthedition (2012)
2. General Organic chemistry by Sachin Kumar Ghosh. New Age Publishers Pvt Ltd (2008)
3. Text book of organic chemistry by Morrison and Boyd. Person(2009)
4. Text book of organic chemistry by Graham Solomons. Wiley(2015)
5. Text book of organic chemistry by Bruice Yuranis Powla. **(2012)**
6. Text book of organic chemistry by C N pillai CRC Press (2012)
8. Organic Chemistry by L. G. Wade Jr.
9. Organic Chemistry by M. Jones, Jr
10. Organic Chemistry by John McMurry.

Unit III

1. Principles of physical chemistry by Prutton and Marron. The MacmillanCompany; 4th edn. (1970)
2. Text Book of Physical Chemistry by Soni and Dharmahara. Sulthan Chand &sons.(2011)
3. Text Book of Physical Chemistry by Puri and Sharma. S. Nagin chand and Co.(2017)
4. Text Book of Physical Chemistry by K. L. Kapoor. (2012)
5. Physical Chemistry through problems by S.K. Dogra. (2015)
6. Text Book of Physical Chemistry by R.P. Verma.
7. Elements of Physical Chemistry byLewis Glasstone. Macmillan (1966)
8. Industrial Electrochemistry, D. Pletcher, Chapman & Hall, London, 1990

Unit IV

1. Principles of Inorganic Chemistry by Puri, Sharma and Kalia Vishal Publications(1996).
2. Concise Inorganic Chemistry by J.D. Lee 3rd edn. Van Nostrand Reinhold Company (1977)
3. Basic Inorganic Chemistry by F.A.Cotton, G.Wilkinson and Paul.L. Gaus 3rd edn Wiley Publishers (2001).
4. Inorganic Chemistry Principles of structure and reactivity by James E.Huhey, E.A. Keiter and R.L. Keiter 4th edn. (2006)
5. Text book of organic chemistry by Morrison and Boyd, Person (2009)
6. Text book of organic chemistry by Graham solomons, Wiley (2015)
7. Fundamentals of organic synthesis and retrosynthetic analysis by Ratna Kumar Kar, CBA,(2014)
8. Organic synthesis by Dr. Jagadamba Singh and Dr. L.D.S. Yadav, Pragati Prakashan, 2010
7. Stereochemistry of organic compounds by D. Nasipuri, New Academic Science Limited, 2012
8. Organic chemistry by Clayden, Greeves, Warren and Wothers, Oxford University Press, 2001
9. Fundamentals of Asymmetric Synthesis by G. L. David Krupadanam, Universities, Press 2014

Semeter IV Course Objectives

- To understand and learn the Crystal field theory splitting in d-orbitals of octahedral, tetrahedral, square planer coordination compounds.
- Pearson's concept of hardness and softness, application of HSAB principle
- Biological significance of various inorganic elements
- Preparation and properties of carbohydrates, aminoacids, proteins and heterocyclic compounds
- Understand Kinetics of chemical reactions
- Learn laws oof photochemical reactions
- Understand various theories of bonding in metals
- Understand the chemistry of colloids and adsorption
- Synthesis of organic compounds

COURSE OUTCOME

Inorganic Chemistry

- Identify the geometries associated with various d-orbital splitting patterns, predict and analyse the stability, magnetic properties and spectra of coordination compounds
- Determine the stability of compounds / complexes and predicting the feasibility of reaction using HSAB rule
- Determine the complex composition using jobs method and mole fraction method, using this knowledge students can synthesis and analyse the new coordination compounds
- Importance of micro and macro inorganic compounds for the human body.

Organic Chemistry

- Elaborate study of classification, structural elucidation, properties, and interconversions of carbohydrates and various tests for the identification of carbohydrates
- Understand the importance of amino acids and proteins in living organisms, their preparation, and properties.
- Students will be able write the various reactions of heterocyclic compound. As heterocyclic compounds play a crucial role in improving the medicinal values of the drugs, having this knowledge will enhance their creative skill in designing the new drugs, especially while working in the research and development laboratories

Physical chemistry

- Understanding chemical kinetics will help students in determining the rates of reactions and under given conditions, Therefore can predict and implement various ways of improving the reaction that is increasing the speed of the reaction
- With the laws of photochemistry, students can understand the photochemical and photophysical processes like fluorescence, phosphorescence, chemiluminescence and photosensitization etc.

General Chemistry

- Students will be able to synthesize new compounds using active methylene compounds from carbon-carbon new bond formation methods learned in carbanions
- Predict the nature of bonding between metal atoms in metals through various theories and predicting the various properties of metals.
- Understand the chemistry behind the working of batteries through their knowledge of conductors, insulators and semi conductors and Knowledge gained in colloids and adsorption.

Laboratory Course
Paper IV Semester-IV

Qualitative Analysis of Organic Compounds: 45hrs (3 h/week)

Qualitative analysis: Identification of organic compounds through the functional group analysis - ignition test, determination of melting points/boiling points, solubility test, functional group tests and preparation of suitable derivatives of the following: Carboxylic acids, phenols, amines, urea, thiourea, carbohydrates, aldehydes, ketones, amides, nitro hydrocarbons, ester and naphthalene.

Outcomes of Practicals

- Will learn and implement the ethics of the laboratory rules while performing the experiments
- Develop the skills of handling various instruments such as Bunsen burner,
- Experimental learning in the Qualitative analysis: Identification of organic compounds through the functional group analysis
- Can identify any unknown compound after performing experiment, this improves and builds their confidence in the synthesis of new compounds and identifying them qualitatively

Government Degree College for Women, Begumpet, Hyderabad
Autonomous Accredited with "B" Grade by NAAC

II B.Sc Chemistry IV Semester Paper- IV (Practicals)

Practical Model Question Paper

Date **BATCH**

Duration: 2 Hours Total Marks: 50

1. Write functional group tests for the following compound (10M)
2. Identify the functional group present in the given Organic compound and report its nature, Physical constant, and solubility and functional group tests. Prepare a solid derivative and submit. (30M)

a) Flame test (3M)
b) Physical constant (3M)
c) Solubility (5M)
d) Functional group tests (15M)
e) Derivative (4M)

3. Record -5M

4. Viva -5M

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
AUTONOMOUS

Max marks: 20M **NAAC ACCREDITED "B"**

Time: 1hour **II Year Internal Question Paper** **Invigilator Signature**

Date: **Internal assessment Test No.1**

CHEMISTRY

Paper-IV

Name: _____ **Roll No._____**

Class: _____ **Semester: IV_____**

SECTION – A

Answer any 2 questions of the following, each question carries 5 marks

2x5=10M

1. Write Pearson's concept of hardness and softness, application of HSAB principles?
2. Write biological significance of Na, K and Mg?
3. Write chichibabin reaction?
4. Write paul-knorr synthesis?

SECTION – B

Answer any one question from the following, each question carries 10 marks

1X10=10M

II. 1. Write Crystal field theory (CFT)- Postulates of CFT, splitting patterns of d-orbitals in octahedral, tetrahedral with suitable examples

(OR)

2. Write all discussion to be confined to (+) glucose as an example of aldo hexoses?

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. II YEAR SEMESTER MODEL QUESTION PAPER
Subject: CHEMISTRY
SEMESTER - IV

Time: 2 Hours **Max. Marks: 60**
Min. Marks: 24

Section – A

I Short Answer questions
Answer any Five of the following questions (5x4=20marks)

1. Write Pearson's concept of hardness and softness, application of HSAB principles?
2. Write applications of coordination compounds ?
3. Define anomers and epimers with example?
4. Write chichibabin reaction?
5. Explain briefly Factors influencing on reaction rate?
6. Explain Stark–Einstein's Law of photochemical equivalence?
7. Explain conductors, semiconductors and insulators.
8. Write Mannich reaction?

SECTION-B

II Essay questions
Answer all questions choosing any one bit from each question (4X10 = 40 Marks)

9. (a) Write Crystal field theory (CFT)- Postulates of CFT, splitting patterns of d-orbitals in octahedral, tetrahedral with suitable examples

(or)

(b) Write biological significance of Na, K, Mg, Ca and Fe?

10. (a) Write all discussion to be confined to (+) glucose as an example of aldo hexoses?

. (or)

(b)Write preparation of glycine and alanine using Strecker synthesis and Gabriel pthalimide synthesis.

11. (a) Define First order reaction, derivation of equation for rate constant.

(or)

(b) Explain Jablonski diagram with internal conversion, inter- system crossing, phosphorescence, fluorescence?

12. (a) Explain Freundlich adsorption isotherm. Langmuir theory of unilayer adsorption isotherm and its Applications?

(or)

(b) Write Michael addition and Knoevengeal condensation reaction.

B.Sc. Chemistry II Year
Semester - IV
Skill Enhancement Course- III (SEC - III) (2 Credits)
Materials and their Applications

Unit – I: Types of Materials 15 h (1 hr/week)

Introduction: Materials and their importance. Classification of Materials, Advanced materials and their need. Types of Materials: Metals, ceramics, polymers and composites; Nature of bonding (Type of bond present). Types and applications of metal alloys: Classification- ferrous and non-ferrous alloys. Ferrous alloys -types and their applications. Non-ferrous alloys – Cu, Al, Ti alloys, their applications and super alloys.

Field Work- Collection of Metal Alloy Samples.

Types and Applications of Ceramics: Classification of Ceramics based on their application- glasses, clay products, refractories, abrasives, cements, and advanced ceramics. Glasses: Compositions and Characteristics of Some of the Common Commercial Glasses; Properties and applications of glass ceramics - preparation of charts depicting various types of glass and their use. Clay products: Structural clay products and the white wares. Refractories: Compositions of four Common Ceramic Refractory Materials, fireclay, silica, basic refractories ex. MgO and special refractories ex. Alumina and Zirconia Cements: Classification, preparation of cement and the setting process; quick setting cements; applications.

Field Work-Visit to industries and collection of samples of materials

Unit – II: Types of Polymers and Applications 15 h (1 hr/week)

Classification of Polymeric materials based on application: Coatings, adhesives, films, foams with examples Polymer Additives: Fillers, Plasticizers, Stabilizers, Colorants, Flame Retardants with examples.

Advanced Materials: Types of advanced materials - semiconductors, bio-compatible materials, smart materials, advanced polymeric materials and nano-engineered materials. Biocompatible materials: Definition. Materials used as biomaterials and their properties. Metals and alloys used in bone and joint replacement. Filling and restoration materials – dental cements, dental amalgams, dental adhesives.

Field Work- Visit to Dental Clinics and interaction with Doctors regarding materials used in Dental treatments.

Smart materials: Shape memory alloys- definition and examples (Ni-Ti alloys, Cu based alloys), applications. Conducting polymers: - Introduction, Electrically conducting polymers and their uses (polyaniline, polypyrrole, polyacetylene and polythiophene).

References

1. William D. Callister Materials Science and Engineering An Introduction, John Wiley & Sons, Inc, 2006.
2. Material science by Kakani and Kakani.
3. Sujata V., Bhat., —Biomaterials‖, Narosa Publication House, New Delhi, 2002.
4. M. V. Gandhi and B. S. Thompson, —Smart Materials and Structures‖, Chapman and Hall, London,

First Edition, 1992.

5 Duerig,T. W., Melton, K. N, Stockel, D. and Wayman, C.M., —Engineering aspects of Shapememory Alloys‖, Butterworth – Heinemann, 1990.

6. Conducting Polymers, Fundamentals and Applications A Practical Approach Authors: Chandrasekhar, Prasanna Ashwin-Ushas Corp., Inc. Kluwer Academic Publishers. Boston

Course Objectives:

The objective of Materials and their Applicationsis intended to provide:

- Basic knowledge of materials science, so that they would be able to understand and distinguish between variety of materials based on their structure and properties.
- Concept of Alloys - its classification and applications.
- To understand the fundamentals (structure, properties and processing) of ceramic materials to appreciate its advantages and limitations and to apply those fundamentals for selecting and developing ceramic materials for different engineering applications.
- Understand the basics of polymers and composites- classifications and their properties and applications.

Course Outcome:

After the successful completion of the course, students should be able to:

- Understand and distinguish between variety of materials based on their structure and properties.
- Know the structure and properties of different ceramic materials.
- Understand the structure and properties of nonferrous metals and alloys.
- Classify different types of polymers and composites and their structure –property relationships
- Students will get to know the different classes of materials used in engineering applications and would be able to choose the right materials for specific applications.

B.Sc. Chemistry II Year Semester IV
Skill Enhancement Course- IV (SEC - IV) (2 Credits)
Chemistry of Cosmetics and Food Processing

Unit-I: Chemistry of Cosmetics and Perfumes

A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, sunscreen lotions, lipsticks, talcum powder, nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours. Essential oils and their importance in cosmetic industries with reference to eugenol, geraniol, sandalwood oil, eucalyptus, 2-phenyl ethyl alcohol. Demonstration experiments or illustration of experimental procedures through charts for the preparation of talcum powder, shampoo and vanishing cream. Analysis of deodorants and antiperspirant - Aluminum, Zinc, Boric acid, Chloride and Sulphide.

Unit-II: Food Processing and Food Adulteration

Food processing: Introduction, methods for food processing, additives and preservatives. Food processing- impact on nutrition, analysis of calcium in milk by complexometric titration, spectrophotometric analysis of iron in foods, Spectrophotometric identification and determination of caffeine and benzoic acid in soft drinks. Field Work -Visit to Food Industries. Food adulteration: Adulterants in some common food items and their identification: Pulses, chilli powder, turmeric powder, milk, honey, spices, food grains and wheat flour, coffee powder, tea leaves, vegetable oil, ghee, ice creams, tomato sauce. Field Work-Collection of adulterated food samples, demonstration of a minimum of five experiments for testing adulterants in food items.

References

1. E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
2. P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi
3. Sharma, B.K. & Gaur, H. Industrial Chemistry, Goel Publishing House, Meerut (1996).
4. Rameen Devi, Food Processing and Impact on Nutrition, Sc J Agric Vet Sci., AugSep 2015; 2(4A):304-311.
5. W.A. Poucher, Perfumes, Cosmetics and Soaps (1993).
6. Srilakshmi, Food Science. Edition: 3rd (2004). 7. Lillian Hoagland Meyer, Food chemistry (2008).
8. Handbook of Analysis and Quality Control for Fruit and Vegetable Products,S. Ranganna,Tata McGraw-Hill Education, 1986 – Food.
9. Fundamental concepts of applied chemistry J.C Ghosh, S. Chand and Co, Ltd, New Delhi.
10. Applied Chemistry K .Bhagavathi Sundhar, MJP publishers.

Course Objectives:

- Provide knowledge on cosmetics, and related sciences, cosmeceuticals (cosmetics with skin, hair and oral care benefits) and personal care and hygiene products.
- Provide multidisciplinary scientific knowledge to gain expertise in the field and to respond the industry challenges effectively.
- Provide with knowledge on marketing approaches on studying consumer need, need gaps, managing competition and global markets.
- Develop your potential to have a career in this fast growing industry in the area of product development & research, regulatory, quality assurance and manufacturing or pursue academic research in the area or to become an entrepreneur in the field.
- To learn about food preservatives and utility.
- To learn about the nutrition and its impotance.

Course Outcome:

- To create a workforce in application of principles of cosmetic science for the rapidly growing FMCG
- Provide in depth learning in cosmetic science, which will serve as a focus for research into the field of cosmetic science
- This course is designed to provide foundation knowledge of cosmetic principles to address the needs of cosmetic industry.
- Provide practical skills in the area of biology, formulation science and analytical techniques required to scientifically design and develop products.
- Students understand the terms food adulteration and adulterant.
- Students understand the different types of adulterants used in food.
- Students acquire the skill to detect the presence of adulterants in different food samples after having observed the animation and simulation.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
AUTONOMOUS
NAAC ACCREDITED "B"

Max marks: 40M
Time: 1 1/2hour

Invigilator Signature

Date: **SEC - Model Paper**

Name: _____ **Roll No._____**
Class: _____ **Semester: IV_____**

. **SECTION-A**

Answer any 4 questions from the following, each question carries 4 marks 4x4=16M

1. UNIT -1
2. UNIT -1
3. UNIT -1
4. UNIT -2
5. UNIT -2
6. .UNIT -2

SECTION-B

Answer all questions, each question carries 12 marks 12x2=24M

7. UNIT -1
8. UNIT -2

B.Sc III yr CHEMISTRY
SEMESTER WISE SYLLABUS
SEMESTER V
Paper-V
Discipline Specific Elective- A (4 credits)

Spectroscopy and Chromatography 60Hrs

Unit I Molecular spectroscopy 15Hrs

Introduction to electromagnetic radiation, interaction of electromagnetic rations with molecules, various types of molecular spectra.

Rotational spectroscopy (Microwave spectroscopy)

Rotational axis, moment of inertia, classification of molecules (based on moment of inertia), rotational energies, selection rules, determination of bond length of rigid diatomic molecules eg. HCl.

Infra red spectroscopy

Energy levels of simple harmonic oscillator, molecular vibration spectrum, selection rules. Determination of force constant. Qualitative relation of force constant to bond energies. Anharmonic motion of real molecules and energy levels. Modes of vibrations in polyatomic molecules. Characteristic absorption bands of various functional groups. Finger print nature of infrared spectrum.

Electronic spectroscopy:

Bonding and antibonding molecular orbitals,electronic energy levels of molecules (σ, π, n), types of electronic transitions:σ-σ*, n-σ*, n-л*, л-л* with suitable examples.Selectionrules,Terminology of chromophore, auxochrome, bathochromic and hypsochromic shifts. Absorption of characteristicsof chromophones: diene, enone and aromatic chromophores. Representation of UV-visible spectra.

Unit II: NMR and Mass Spectrometry 15 Hrs

S5-E-A-II: Proton Magnetic Resonance Spectroscopy

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, factors affecting chemical shifts, NMR splitting of signals — spin-spin coupling, representation of proton NMR spectrum — Integrations. 'H NMR spectrum of— ethyl bromide, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate and acetophenone.

Mass Spectrometry

Electron Impact Mass: Basic principles, Nitrogen rule, types of ions: Molecular ion and fragment ions. Representation of mass spectrum, types of peaks (molecular ion peak, base peak and isotopic ion peaks). Determination of molecular formula. Mass spectrum of ethyl chloride, ethyl bromide and acetophenone.

Unit III: Separation techniques – I **l5Hrs**

SS-E-A-III Solvent Extraction - Principle, Methods of extraction: Balch extraction, continuousextraction and counter current extraction. Application — Determination of Iron(III). **Chromatography:** Classifition of chromatograpic methods, principles of differential migration, adsorption phenomenon, nature of adsorbents, solvent systems.

Thin layer Chromatography (TLC): Advantages, preparation of plates, Solid phase and mobile phase used in TLC, eluotopic series, development of the chromatogram, Detection of the spots, visualizing agents, factors effecting Rf values and applications of TLC.

Paper Chromatography: Principle, choice of paper and solvent systems, development of chromatogram **–** ascending, descending, radial and two dimensional chromatography and applications.

Unit IV: Chromatography- II
15Hrs

S5-E-A-I: Column Chromatography- Principle, Types of stationary phases, Column packing **–** Wet packing technique, Dry packing technique. Selection criteria of mobile phase solvents for eluting polar, non-polar compounds and its applications.

Ion exchange chromatography: Principle, cation and anion exchange resins, its application in separation of ions.

Gas Chromatography: Theory and instrumentation (Block Diagram), Types of stationary phases and carrier gases (mobile phase).

High performance liquid chromatography: Theory and instrumentation, stationary phases and mobile phases. Analysis of paracetamol.

Recommended Text Books and Reference Books

1.Fundamentals of Molecular Spectroscopy, Banwell & McCash
2.Organic spectroscopy, William Kemp, Palgrave Macmillan; 2nd Revised edition
3.Spectroscopy, B K Sharma Krishna Prakashan Media, 1981
4.Elements of Organic Spectroscopy, Y R Sharma.
5.Applications of Absorption Spectroscopy of Organic Compounds (English, Paperback,Dyer R.John)
6. Organic Chemistry, Morrison and Boyd, Pearson Publications.
7. Introduction to Spectroscopy by Donald Pavia, Gary Lampman and George Kriz.
Saunders College Division,2001
8. Chemistry text book for B.Sc., published by Telugu Academy, Govt. of Telangana.
9.Analytical Chemistry by David Krupadanam, Universities Press (India) Limiied.

10.Principles of Instrumental Analysis, D.A. Skoog, F.J. Holler, T.A. Nieman, Engage earning India Ed.
11.Fundamentals of Analytical Chemistry 6 th Ed., D. A. Skoog, D.M. West, F.J. Holler,Saunders College Publishing, Fort worth (1992).
12. Instrumental Methods of Analysis. 7'th Ed. Willard, H.H., Merritt, L.L., Dean, J, & Settle,F.A. Wordsworth Publishing Co. Ltd., Belmont, California, USA, i sg8.
13.A Textbook of Quantiitative Inorganic Analysis 7t1i Ed., Vogel, A. I. Prentice Hall.
14.Analytical Chemistry 7 th edition by Gary D. Christian (2004).
15.Separation Methods, M.N Sastry, Himalaya Publication (2004).

Outcomes of Semester-V

- Gaining practical knowledge of handling chemicals and analytical instruments
- Explain principle and Applications of analytical and chromatographic techniques
- Students will be able to describe the common methods and main methods of spectroscopic and chromatographic analysis
- Assess and suggest a particular analytical technique and evaluate sensitivity
- Explain theoretical principle in separation and structure elucidation
- Able to interpret the structure with help of spectra
- Gain knowledge on importance of instrumental methods than chemical methods.
- Gain knowledge on principles involved in various techniques.

Semester - V
Laboratory Course
Paper V Experiments in Physical Chemistry-I

45 h (3 h / w)

1. Distribution law
a) Determination of molecular status and partition coefficient of benzoic acid in Toluene and water.
b) Determination of distribution coefficient of acetic acid between n-butanol and water.

2. Electrochemistry
a) Determination of cell constant of a conductivity cell.
b) Verification of Ostwald's dilution law- Determination of dissociation constant (K_a) of acetic acid by conductivity measurements.

3. Colorimetry
a) Verification of Beer's law using $KMnO_4$
b) Determination of the concentration of the given $KMnO_4$ solution.

4. Adsorption
b) Adsorption of acetic acid on animal charcoal - Verification of Freundlich adsorption isotherm.

5. Physical constants
a) Surface tension and b) viscosity of liquids. (Demonstration Experiment)

Reference books:

1. Senior practical physical chemistry. B. D. Khosla, V.C. Garg, Adarsh Gulati Published by R. Chand & Co.
2. Practical Physical Chemistry: B. Vishwanathan and P.S. Raghavan. Viva Books
3. Practicals in Physical Chemistry by P.S. Sindhu ISBN-10: 1-4039-2916-5 / 1403929165 ISBN-13: 978-1-4039-2916-7 / 9781403929167

Outcomes:

- Developed skills in procedures and instrumentations
- Skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments
- Understanding of the professional and safety responsibilities when working with chemical systems

GOVERNMENT DEGREE COLLEGE FOR WOMENS BEGUMPET, HYDERABAD

III YEAR PRACTICAL MODEL QUESTION PAPER

Semester-V

Duration : 3hrs. Total marks 50

1. Write the principle and procedure with necessary equation. (5M)

2. Five sets of experimental readings (for kinetics) and twelve experimental readings (for instrumentation experiments) with proper tabulation. (15M)

3. Calculation results (10M)

4. Graph (10M)

5. Viva (5M)

6. Record (5M)

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET
AUTONOMOUS

Max marks: 20MARKS **NAAC ACCREDITED "B"**

Time: 1hour **model Internal Question Paper** **Invigilator Signature**

Date: **Internal assessment Test No.1**

CHEMISTRY

Paper-V

Name: _____ **Roll No._____**

Class: _____ **Semester: V_____**

SECTION – A

Answer any 2 questions (5x2=10M)

1. Define chemical shift and coupling constant.
2. Discuss about nitrogen rule.
3. Define chromophore and auxochrome
4. Write characteristic absorption bands of various functional groups

SECTION – B

Answer any one question (10X1=10M)

1. Write Beer Lambert's Law and its limitations ?

(or)

2. Draw mass spectrum of ethyl chloride and acetophenone

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. III YEAR Model question paper
Subject: CHEMISTRY
SEMESTER – V
PAPER - V

Time: 2 Hours **Max. Marks: 60**

Section-A

I. Answer any four of following questions. 4 x 5 = 20

1. Unit-1
2. Unit-1
3. Unit-2
4. Unit-2
5. Unit-3
6. Unit-3
7. Unit-4
8. Unit-4

SECTION –B

Answer the following by selecting any two from each. 4 x10 = 40M

9. a) Unit-1
b) Unit-1
c. Unit-1
d. Unit-1

10. a) Unit-2
b) Unit-2
c. Unit-2
d. Unit-2

11. a) Unit-3
b) Unit-3
c. Unit-3
d. Unit-4

12. a) Unit-4
b) Unit-4
c. Unit-4
d. Unit-4

Semester V

Generic Elective (GE) Course - I (4Credits)
(for B.Sc. Non Chemistry/B.A/B.Com Students)

Chemistry of Cosmetics, Food Processing, Drugs and Pharmaceuticals 60Hrs

Unit-I: Chemistry of Cosmetics and Perfumes 15 Hrs

A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, sunscreen lotions, lipsticks, talcuin powder. nail enamel, creams (cold, vanishing and shaving creams), antiperspirants and artificial flavours. Essential oils and their importance in cosmetic industries with reference to eugenol, geraniol, sandalwood oil, eucalyptus, 2-plienyl ethyl alcohol.
Demonstration experiments or illustration of experimental procedures though charts for the preparation of talcum powder, shampoo and vanishing cream. Chemistry and Applications of deodorants and antiperspirant - Aluminum, Zinc, Boric acid, Chloride and Sulphide.

Unit-II: Food Processing and Food Adulteration 15 Hrs

Food processing: Introduction, methods for food processing, additives and preservatives. Food processing- impact on nutrition,

Food adulteration: Adulterants in some common food items and their identification: Pulses, chilli powder, turmeric powder, milk, honey, spices, food grains and wheat flour, coffee powder, tea leaves, vegetable oil, gliee, ice creams, tomato sauce.
Food Packaging: Definition and function of packaging-Classification of packaging materials- different types of packaging materials such as glass, wood, metal, paper, wood, plastic etc., advantages and disadvantages of each packaging material. Packaging materials and systems: corrugated fibre board boxes, shrink bundles and reusable packages. Effect of packaging materials on nutritive values of food.
Food labelling: Introduction, need and importance.

Unit — III: General Characteristics of Drugs **l5Hrs**
Introduction: Diseases — causes of diseases, Drug — definition and sources.
ADME of drugs (brief) — Absorption, distribution, drug metabolism (in liver), elimination (brief). Toxicity. Examples (i) Zintac (Ranitidine, antacid) (ii) Paracetamol (antipyretic) (iii) Benadryl (Cough syrup). Characteristics of an ideal drug.
Nomenclature of **Drugs:** chemical name — generic name — trade name. Trade names forthe given generic names — (i) Aspirin (ii) Amoxycillin (iii) Ciprofloxacin (iv) ParacetamolM(v) Mebendazole

Drug formulations: Definition — need for conversion of drug into pharmaceutical (drug formulations) — Additives — diluents, binders, lubricants, antioxidants, flavourants, sweeteners, colourants, coating agents. Classification of Drug formulations: oral, parenterals and topical dosage forms —
advantages and disadvantages.
(i) Oral Dosage forms: Tablets (Aspirin — analgesic; Ciprofloxacin - antibacterial). Capsules (Amoxycillin — antibiotic; Omeprazole-antacid). Syrups (B-complex syrup; Benadrjl- Cough Syrup).

(ii) Parenterals (Injection forms): Propranolol (antihypertensive), Heparin (anticoagulant)
(iii) Topical dosage forms: Creams and Ointments
(iv) Antiallergic: Aclometasone (Aclovate), Betamethasone valerate(2%) Multiple purposes,
(v) Anti-itching: Doxepin Zonalon), Antifungal: Miconozole (Dactarin, Neomicol), Ketoconazole, (Nizoral Cream), Fluconazole, Anesthetic- Lidocaine, (Lidocaine ointment) and Antiseptic: Boro Plus Cream, For burns -Iodine ointment

Unit - IV: Classification of Drugs

Classification of drugs based on therapeutic action- Chemotherapeutic agents, Pharmacodynamic agents and drugs actilig on iiietabolic processes.

Brief explanation for the following:

(i) **Chemotheraupetic agents:** Antimalarials Chloroquine; Antibiot ic — AmoXICillin; Antitubercular drugs — isoniazide; Antiprotozoa ls — metronidazole.

(ii) Pharmcodynamic agents:

(a) Drugs acting on CNS: Diazepam (CNS depressant), General anesthetic (thiopenta l sodium), antipyretic and analgesic (Iburofen)

(b) Drugs acting on PNS: local anaesthetics (Benzocaine)

(c) Drugs acting on cardiovascular system: Metoprolol (antihypertensive agents), Nefidipine antianginal and antihypertensive agent)

(d) Drugs acting on renal system: Diuretics (Acetazolamide)

(iii) Drugs acting on metabolic processes:

(a) Vitamins: Common name, source, deficiency, vitamin A, B2, B6, C, D, E and K — remedy

(b) Hormones: Function (brief) - deficiency of hormones (Insulin, Testosterone and Osterone)

Course Objectives:

The objective of GE-1 is intended to provide:

- Basic knowledge on cosmetics and perfumes which are used in daily life
- Basic knowledge on adulteration of food
- Have an idea of processing food and packing of food
- Basic knowledge in pharmaceuticals in addition to understand the types of diseases, drugs used to cure specific diseases, concept of ADME, mode of action etc.
- To create interest among the students by illustrating the development of vaccines, drugs etc. that are used in treating common diseases.

- To make them understand the terminology used in pharmaceuticals such as pharmacy, pharmacokinetics, Pharmacodynamics,receptors etc.
- To have a basic knowledge of drug formulation, dosage forms, classification of drugs etc., so that it will be very useful in their day to day life.
- The importance of vitamins, harmones in the growth and development of human body.

Course Outcome:

After the successful completion of the course, students should be able to:

- Chemicalswhich are used to prepare cosmetics and perfumes
- Broad idea of adulteration of food and how to identify adultered food
- Develop skills on food processing and food packing methods
- Differentiate the diseases according to the symptoms.
- Classify the drugs based upon chemotherapy, Pharmacodynamics properties.
- Describe development, regeneration and normal function of body systems.
- Select the dose for a drug.
- Formulate and evaluate conventional dosage forms.
- Develop the drug synthesis.

Recommended Text Books and Reference Books

I. Industrial Chemistry, Vol -1, E. Stocchi, Ellis Horwood Ltd. UK.
2. Engineering Chemistry, P.C. Jain, M. Jain, Dhanpat Rai & Sons, Delhi.
3. Industrial Chemistry, Sharma, B.K. & Gaur, H. , Goel Publishing House, Meerut (1996).
4. Food Processing and Impact on Nutrition, Rameen Devi, Sc J Agric Vet Sci., Aug-Sep 2015; 2(4A):304-311.
5. Perfumes, Cosmetics and Soaps , W.A. Poacher, (1993).
6. A first course in food analysis by A Y Sathe
7. Food Science by N.Potter, CBS pub[isliers
8. Food chemistry, Lillian Hoagland Meyer, (2008).
9. A Handbook of food packaging by F. A. Paine and H.Y. Paine.
10. Fundamental concepts of applied chemistry 3.C GhOSll, S. Chand and Co, Ltd, New Delhi.
I I. Applied Chemistry K .Bhagavathi Sundliar, MIP publishers.
12. Drugs by G.L,David Krupadanam, D.Vijaya Ptasad, K.Varaprasad Rao, K.L.N. Reddy, C.Sudhakar , Universities Press (India) Limited 2007.

13.An Introduction to Medicinal Chemistry by Graham L. PntfiCk, Oxford University Press, New York. 1995

B.Sc. Chemistry III Year

Semester-VI, Paper-VI

Discipline specific elective-A(4 Credits)

Medicinal Chemistry **60Hrs**

Unit- I:Introduction and Terminology **15Hrs**

S6-E-A-I: Diseases: Common diseases, infective diseases–insect borne, air-borne, water-borne and hereditary diseases.

Terminology in Medicinal Chemistry: Drug, Active pharmaceutical ingridients(API),Phrmaceuticals,Pharmacology, Pharmacophore, Pharmacodyna-mics, Pharmacokinetics, metabolites, anti metabolites and therapeutic index.

Drugs: Nomenclature: Chemical name, Generic name and Trade names with examples;

Classification: Classification based on structures and therapeutic activity with examples.

ADMET: a) Absorption: Definition, absorption of drugs across the membrane – active and passive absorption, routes of administration of drugs. b) Distribution: definition and effect of plasma protein binding. c) Metabolism: definition, phase I and phase II reactions.d) Elimination: definition and renal elimination. e) Toxicity

Unit-II: Enzymes and Receptors **15Hrs**

S6-E-A-II: Enzymes: Introduction. Mechanism and factors affecting enzyme action, Specificity of enzyme action (including stereo specificity), Enzyme inhibitors and their importance. Types of inhibition - reversible, irreversible and their subtypes with examples.

Receptors: Introduction, Drug action-receptor theory, Mechanism of drug action, concept of agonists and antagonists with examples. Drug receptor interactions involved in drug receptorcomplex. binding role of –OH group, -NH_2 group, quaternary ammonium salts and double bond. Structure – activity relationships of drug molecules, explanation with sulfonamides.

Unit- III: Synthesis and Therapeutic Activity of Drugs **15Hrs**

S6-E-A-III: Introduction, synthesis and therapeutic activity of :

Chemotherapeutics: Sulphanilamide, dapsone, Pencillin-G (semi synthesis), Chloroquin, Isoniazid, Cisplatin and AZT.

Drugs to treat metabolic disorders: Anti diabetic - Tolbutamide; Antiinflammatiory –

Ibuprofen; Cardiovascular- Glyceryl trinitrate; Antipyretic (paracetamol, aspirin) and Antacid- Omeprazole.

Drugs acting on nervous system: Anesthetics-definition, Classification-local and general. Volatile- Nitrous oxide, chloroform uses and disadvantages. Local anesthetics – benzocaine.

Unit- IV: Molecular Messengers and Health Promoting Drugs 15Hrs

S6-E-A-IV: Molecular Messengers: Introduction to hormones and neurotransmitters, Thyroid hormones, Antithyroid drug-Carbimazol. Adrenaline: Adrenergic drugs- salbutamol, atenelol. Serotonin: SSRIs- fluoxetine. Dopamine: Antiparkinson drug- Levodopa .

Health promoting drugs: Introduction, sources, Deficiency disorders and remedy of Vitamins A,B, C, D, E K and micronutrients – Na, K, Ca, Cu, Zn and I .

Reference books

1. G.L. Patrick: Introduction to Medicinal Chemistry, Oxford University Press, New York. 2013.
2. Thomas Nogrady, Medicinal Chemistry, Oxford Univ. Press, New York.2005.
3. David William and Thomas Lemke, Foye's Principles of Medicinal Chemistry, Lippincott Williams & Wilkins, 2008.
4. Ashutosh Kar Medicinal Chemistry, New Age International, 2005.
5. O.D.Tyagi & M.Yadav Synthetic Drugs by, Anmol Publications,1998.
6. Medicinal Chemistry by Alka L. Gupta, Pragati Prakashan.
7. G. L. David Krupadanam, D.Vijaya Prasad, K.Varaprasad Rao, K. L. N. Reddy, C. Sudhakar, Drugs, Universities Press (India) Ltd. 2012.

Objectives and outcomes of semester-VI

- Basic knowledge in pharmaceuticals in addition to understand the types of diseases, drugs used to cure specific diseases, concept of ADME, mode of action etc.
- Differentiate the diseases according to the symptoms.
- Classify the drugs based upon chemotherapy, Pharmacodynamics properties.
- Understanding of basic biological and pharmacological interactions
- Use of corresponding knowledge for the development of clinically active drugs
- Drug design and analytical methods
- Relate the structure and physical properties of drugs to pharmacological activity
- Correlating the pharmacology of disease and its cure
- Drug metabolic pathways, adverse effect and therapeutic value of drug
- Chemical synthesis of some drugs
- The importance of vitamins, harmones in the growth and development of human body.

Semester - VI

Laboratory course

Experiments in Physical Chemistry-II

Paper VI (Physical Chemistry) 45hrs (3 h/w)

1. **Kinetics**

a) Determination of specific reaction rate of the hydrolysis of methyl acetate catalyzed by hydrogen ion at room temperature.

b) Determination of rate of decomposition of hydrogen peroxide catalyzed by $FeCl_3$.

2. **Electrochemistry**

A. Potentiometry:

b) Determination of redox potential of Fe^{2+}/Fe^{3+} by potentiometric titration of ferrous ammonium sulphate vs. potassium dichromate.

c) Precipitation titration of KCl vs. $AgNO_3$ -Determination of given concentration of silver nitrate.

B. pH metry:

a) pH metric titration of strong acid (HCl) vs. strong base- Determination of the concentration of the given acid.

b) pH metric titration of weak acid(acetic acid) with strong base(NaOH).- Determination of acid dissociation constant (K_a) of weak acid.

3. **Conductometry:**

Determination of overall order: Saponification of ethyl acetate with NaOH by conductance measurements.

Objectives and outcomes:

- Developed skills in procedures and instrumentations
- Gain knowledge on Principle involved in conductometry, potentiometry and pH metry and their uses in qualitative and quantitative analysis.
- Skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments
- Understanding of the professional and safety responsibilities when working with chemical systems

Paper Code: /CBCS

GOVERNMENT DEGREE COLLEGE FOR WOMEN
BEGUMPET, HYDERABAD - 16
B.Sc. III YEAR Model question paper
Subject: CHEMISTRY
SEMESTER – VI
PAPER – VI

Time: 2Hours **Max. Marks: 60**

Section-A

I. Answer any four of the following questions. 4 x 5 = 20

1. Unit-1
2. Unit-1
3. Unit-2
4. Unit-2
5. Unit-3
6. Unit-3
7. Unit-4
8. Unit-4

SECTION –B

Answer the following by selecting any two from each. 4 x10 = 40M

9. a) Unit-1
   b) Unit-1
   c. Unit-1
   d. Unit-1

10. a) Unit-2
    b) Unit-2
    c. Unit-2
    d. Unit-2

11. a) Unit-3
    b) Unit-3
    c. Unit-3
    d. Unit-4

12. a) Unit-4
    b) Unit-4
    c. Unit-4
    d. Unit-4

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD-16

Affiliated To Osmania University, Re-Accredited With 'B^{+}' Grade by NAAC

DEPARTMENT OF ENGLISH

SYLLABUS, POs, PSOs & COs

CHOICE BASED CREDIT SYSTEM (2020-21)

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program specific outcomes:

- Help the students to create the ability to distinguish and understand the various genres like short fiction, prose, poetry and drama
- Helps the students for all academic purposes including writing project reports, Newspaper Reports.
- Student experience the pleasure of reading
- Strengthen the writing skills for specific purposes
- Soft skills helps to mould the inherent attitudes
- Students can identify common communication problems

Government Degree College for Women (A), Begumpet

Department of English

Course Structure

BA/ B.Sc/ B.Com & BBA

Semester	Course Code	Course Title	No. of Credits
I	3310/3312/30630/30172/31522/32021	English Made Easy	04
II	3310/3312/30630/30172/31522/32021	English Made Easy	04
III	3310/3312/30630/30172/31522/32021	English in Use	03
III	3310/3312/30630/30172/31522/32021	SEC	02
IV	3310/3312/30630/30172/31522/32021	English in Use	03

Government Degree College for Women (A), Begumpet

Department of English

BA/ B.Sc/ B.Com & BBA

I Semester

Max. Marks- 100
4 Credits

Course Outcomes:

After completion of the course a student is able to

CO1. To understand the varieties of cultures, languages, poetic diction, use of language, imagery, etc., through exposure to various Poems, Essays, Short Stories, and One Act Plays.

CO2. To acquire the knowledge of language skills, poetic diction, vocabulary, dialogue writing, etc.

CO3. To read and appreciate the prescribed literary selections for pleasure, and to analyze and interpret the given poem, essay, short stories for narrative technique and moral behind them

CO4. To apply the acquired knowledge of grammar and vocabulary to the real time situations through practice of conversation, essay writing and exercises.

CO5. Students would understand different sounds, nuances and their proper enunciation in English Language

CO6. Student would be able to speak and write grammatically correct sentences on learning all parts of grammar and tenses

CO7. Students would be able to understand the root words, their origin, prefixes, suffixes, homophones, Homographs, Homonyms and their meanings.

CO8. Students would be able to identify commonly miss-spelt words and would be able to formulate new words using prefixes such as, un-, dis-, and suffixes like, -ment, -tion,-sion,etc.

CO9. Students would be able to learn right usage of punctuation marks like, Capitalization, Full stops, Comma, in a sentence

CO10. Students learn to start and sustain a formal conversation. They would be capable to describe their course of study and would also be able to leave a voicemail or make an appointment over phone.

CO11. Students would enhance their reading competence by reading about some of the historical incidents and inspirational people

CO12. Students develop their creative writing skills through précis writing and dialogue writing

CO13. This helps to build self confidence and would enable the student to speak confidently in any official or unofficial conversations.

CO14. Students would be able to develop a positive mindset by knowing about themselves, their strengths and the points they could develop for a successful life

Poetry:

- A Psalm of Life - Henry Wadsworth Longfellow.

Prose:

- Happy People - William Ralph Inge

Short fiction:

- The Curb in the Sky – James Thurber

Drama:

- The Dear Departed – Stanley Hough

Language Component:

- Pronunciation
- Vocabulary
- Spelling
- Punctuation
- Conversation
- Reading Passage
- Writing
- Soft Skills
- Value Education.

Government Degree College for Women (A), Begumpet

Department of English

BA/ B.Sc/ B.Com & BBA

II Semester

Max. Marks- 100
4 Credits

Course Outcomes:

After completion of the course a student is able to

CO1. To understand the varieties of cultures, languages, poetic diction, use of language, imagery, etc., through exposure to various Poems, Essays, Short Stories, and One Act Plays.

CO2. To acquire the knowledge of language skills, poetic diction, vocabulary, dialogue writing, etc.

CO3. To Understand and appreciate the musical quality given by meter, rhyme and rhythm in poetry and the idiomatic expressions in prose sections

C04. To apply the acquired knowledge of grammar and vocabulary to the real time situations through practice of conversation, essay writing and exercises.

C05. Students would understand different Affricate sounds, Plosive sounds, Approximant sounds & their proper enunciation in English Language

C06. Student would be able to speak and write grammatically correct sentences on learning all parts of grammar and tenses

CO7. To develop reading, writing and comprehension skills apart from the vocabulary and usage.

CO8. Students would be able to identify commonly miss-spelt words and would be able to formulate new words using suffixes like, -ment, -al,-ance,-ence, -able,-ible, etc.

CO9. Students would be able to learn right usage of punctuation marks like, Hyphen, Em-dash, in a sentence

CO10. Student learns to start and sustain a formal conversation. They would be capable to describe their course of study and would also be able to leave a voicemail or make an appointment over phone.

CO11. To analyze and interpret the socio-cultural aspects based on the prescribed prose texts

CO12. To acquire the knowledge of business writing skills like note making, formal letters and informal letters.

CO13. This helps to build leadership skills and also helps in the overall etiquette building& grooming of the students

CO14. Student would be able to develop a positive mindset by knowing about themselves, their strengths and the points they could develop for a successful life

Poetry:

- Stanzas Written in Dejection, Near Naples. – Percy Bysshe Shelley

Prose:

- Benaras – Aldous Huxley

Short Fiction:

- A Visit of Charity – Eudora Welty

Language Component:

- Pronunciation
- Vocabulary
- Spelling
- Punctuation
- Conversation
- Reading Passage
- Writing
- Soft Skills
- Value Education.

Government Degree College for Women (A), Begumpet

Department of English

BA/ B.Sc/ B.Com & BBA

III Semester

Max. Marks- 100
3 Credits

Course Outcomes:

After completion of the course a student is able to

CO1. To Understand and appreciate the musical quality given by meter, rhyme and rhythm in poetry of Indian and World Poets

CO2. Students would also be able to get a glimpse of colonial literature.

CO3. Students would get a brief idea of the some of the technical terms of business English, their antonyms, synonyms. They also would be able to use right usage of idioms.

CO4. The advanced grammar like the concord and connectives further enriches the students' usage of English.

CO5. Students would be able to present their opinions and ideas more effectively by learning writing techniques like, Discursive essay method and Argumentative essay method.

Poetry:

- Life – Charlotte Bronte
- Punishment in Kindergarten – Kamala Das

Prose:

- A Wrong Man in Workers' Paradise – Rabindranath Tagore
- Toasted English – R.K. Narayan

Language Components:

- Synonyms & Antonyms
- Prepositions
- Voice
- Concord

- British & American English- Common Words.
- Idioms
- Connectives
- Essay Writing- Discursive Essay, Argumentative Essay

Government Degree College for Women (A), Begumpet

Department of English

BA/ B.Sc/ B.Com & BBA

IV Semester

Max. Marks- 100
3 Credits

Course Outcomes:

After completion of the course a student is able to

CO1. To Understand and appreciate the musical quality given by meter, rhyme and rhythm in poetry of Indian and World Poets

CO2. Students would also be able to get a glimpse of colonial literature.

CO3. Students would get a brief idea of the some of the technical terms of business English, their antonyms, synonyms. They also would be able to use right usage of idioms.

CO4. The advanced grammar like the Reported Speech and Voice helps the students to present their opinions more effectively

CO5. Students would become more office ready by learning to write Business reports and media reports

Poetry:

- As I Grew Older – Langston Hughes
- The Flower – Alfred Tennyson

Prose:

- Grammar of Anarchy – B.R. Ambedkar.
- The Kitemaker – Ruskin Bond

Language Components:

- Phrasal Verbs
- Concord
- Commonly Confused Words
- One Word Substitutes

- Determiners
- Report Writing- Business Reports, Media Reports
- Technical Vocabulary (Business & Media)
- Reported Speech (Including Reporting Verbs)

Government Degree College for Women (A), Begumpet

Department of English

BA/ B.Sc/ B.Com & BBA

III Semester

Skill Enhancement Course (SEC)

Max. Marks- 50
2 Credits

Course Outcomes:

After completion of the course a student is able to

CO1. To understand the various elements of poetry such as diction, tone, genre, imagery, figures of speech, symbolism, theme and other stylistics

CO2. To be able to locate grammar in Prose, to develop prose style, and to understand the difference between the formal and the informal

CO3. To be able to understand and use the techniques of Report Writing: Business Reports and Media Reports

CO4. To be able to use the Idioms, phrases, one word substitutions, synonyms and Antonyms and other vocabulary related elements in writing essays and oral communication

Topic

1. Listening
2. Speaking
3. Reading

4. Writing and different modes of writing
5. Digital Literacy
6. Non-Verbal Communication

GOVERNMENT DEGREE COLEGE FOR WOMEN, BEGUMPET

(AUTONOMOUS)

Re-Accredited with 'B^{+}' Grade by NAAC

Programme Outcomes

Department of Economics

Scheme of Study:

Sem	Paper Code	Course	Teaching Hours	Credits	Internal Assessment	Theory Marks	Total Marks
I	DSC Paper-I	Micro Economics	5	5	40	60	100
II	DSC Paper-II	Macro Economics	5	5	40	60	100
III	DSC Paper-III	Statistics for Economics	5	5	40	60	100
	Sec-I	Rural Development	2	2	10	40	50
IV	DSC Paper-IV	Indian Economy	5	5	40	60	100
	Sec-II	Entrepreneurship Development	2	2	10	40	50
V	DSC Paper-V	Development Economics	4	4	25	75	100
	DSE Paper V-I (A)	Indian Economy	4	4	25	75	100
	DSE Paper-V-I(B)	Financial Economics	4	4	25	75	100
	GE-I	Telangana Economy	2	2	10	40	50
	SEC-III	Quantitative Methods for Economists-1	2	2	10	40	50
VI	DSC PAPER-VI	International Economics	4	4	25	75	100
	DSE PAPER VI-II(A)	Economics of Insurance	4	4	25	75	100
	DSE PAPER VI-II(B)	Industrial Economics	4	4	25	75	100
	GE-II	Economics of Environment	2	2	10	40	50
	SEC-IV	Quantitative Methods for Economists-2	2	2	10	40	50

Programme Outcomes of B.A. Course

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes of Department of Economics

PSO1 – To know the key changes in Indian and Global Economies.

PSO2 – To know the Economic growth trends of Indian and World Economies.

PSO3 – To analyse macro-economic policies including fiscal and monetary policies of India.

PSO4– To understand the behaviour of financial and money markets and cost benefit analysis for making investments.

PSO5– To develop the general ability of analysing economic problems and issues.

PSO6 – To determine economic variable including inflation, unemployment, poverty, GDP, Balance of Payments problems, foreign exchange rates by using statistical methods.

PSO7. Understand theoretical and practical aspects of Economics.

PSO8. Evaluate Economic behaviour of Individuals and organisations.

PSO9. Suggest the policy makers about desirable changes to be made in Micro and Macro Economic issues as future policy makers.

PSO10. Gain ability to understand the economic problems of the nation.

PSO11. Able to offer palatable solutions for economic challenges.

PSO12. Attain Proficiency to analyze the economic decision of Government and non-Govt. entities.

SEMESTER-I

MICRO ECONOMICS, Discipline Specific Course – Paper – I

Credits: 5 **Total Hours: 90**

Course outcome

On completion of the Course, students will:

CO1. Understand in details with examples Concepts of Micro and Macro Economics.
CO2. Understand in depth Laws of Utility.
CO3. Learn in details with examples meaning and properties of indifference curve.
CO4. Deliberate in depth cost and revenue concepts.
CO5. Specify the details of concepts of Marginal cost and Marginal revenue
CO6. Understand the details of meaning and types of markets. .
CO7. . Learn in depth types of Imperfect Competition
CO8. Deliberate the characteristics of Price Discrimination.
CO9. Identify the classification and characteristics of Kinked Demand Curve.

Course Description:

This course exposes the student to the basic principles and application of Microeconomic Theory.

Module I: Introduction and Consumer Behaviour

Definitions: Wealth, Welfare, Scarcity and Growth. Scope and Limitations. Importance of Economics. Concept of Utility. Cardinal and Ordinal Utility Analysis. Law of Diminishing Marginal Utility, Law of Equi- Marginal Utility. Properties of Indifference Curves, Concept of Budget Line, Consumer Equilibrium, Consumer Surplus. Price Consumption Curve, Income Consumption Curve, Derivation of Demand Curve with the help of Ordinal Utility Analysis. Concept of Price, Income and Substitution Effects.

Module II: Production Analysis

Concepts of Short Run and Long Run Production Function, Properties of Iso-Product Curves, Concept of Factor Price Line , Analysis of Least Cost Input Combination, Concept of Expansion Path and Economic Region of Production, Concept of Returns Scale and Types of Returns to Scale. Linear and Homogenous Production Function, Properties of Cobb-Douglas Production Function.

Module III: Cost and Revenue Analysis

Cost Concepts: Accounting, Real, Opportunity, Explicit Cost. Total Cost , Total Fixed Cost, Total Variable Cost, Average Cost, Average Fixed Cost, Average Variable Cost, Marginal Cost and the Relationship between Average and Marginal Cost, Derivation of Long Run Average Cost Curve. Economies of Scale: Internal and External Economies.

Revenue Concepts: Total, Average and Marginal, Relationship between Average Revenue and Marginal Revenue and Price Elasticity of Demand.

Module IV: Market Structure: Imperfect Competition

Monopoly : Equlibrium of a Monopolist with Price Discrimination, Degree of Price Discrimination, Welfare Loss Under Monopoly. Monopolistic Competition: Characteristics, Concepts of Product Differentiation and Selling Cost, Analysis of Resources Wastage under Monopolistic Competition. Oligopoly: Characteristics of Oligopoly, Reasons for Price Rigidity in Non-Collusive Oligopoly. Duopoly: Augustin Cournot's Modern Version of Duopoly.

Module V: Analysis of Business Firm , Profit and Pricing Strategies

Characteristics of Business Firm, Objectives of Business Firm: Profit maximization, Sales Revenue maximization, Market shares maximization, Growth maximization. Profit Concepts: Accounting and Economic, Break-Even Point and Profit-Volume Analysis.
Pricing Strategies: Cost Plus Pricing, Marginal Cost Pricing, Rate of Return Pricing, Price Skimming, Penetration Pricing, Loss-Leader Pricing, Mark-Up Pricing and Administered Prices.

SEMESTER-II, **MACRO ECONOMICS**

Discipline Specific Course – Paper – II

Number of Credits: 5 **Total Hours: 90**

Course Outcome:

On completion of the Course, students will:
CO1. Identify in details with examples Key variables of Macro Economics.
CO2. Understand in details with examples Concepts of National Income.
CO3. Identify in depth Marginal Efficiency of Capital.
CO4. Specify the details of Concept of Multiplier.
CO5. Identify the characteristics of Keynesian Macro Economics.
CO6. Deliberate in depth Liquidity Theory of money.
CO7. Identify the characteristics of Demand for Money.
CO8. Identify in details with examples Concept if Inflation.
CO9. Learn the classification and characteristics of Trade Cycles.

Course Description:
This course introduces students to the basic concepts in Macroeconomics, definition, measurement and variables like GDP, consumption, savings, investment and Balance of Payments.

Module– I: Introduction:

Macro Economics – Concept of Circular Flow of Incomes –National Income Analysis: Concepts and Components – Methods of Measurement –Difficulties and Limitations in the Estimation of National Income.

Module– II: Theories of Income and Employment:

Keynesian Theory of Income and Employment: Effective Demand – Consumption Function: Average Propensity to Consume (APC) and Marginal Propensity to Consume (MPC) – Factors Determining Consumption Function – Savings Function: Average Propensity to Save and Marginal Propensity to Save – Concepts of Multiplier and Accelerator.

Module– III: Investment & Theories of Interest Rate:

Capital and Investment: Types of Investment, Determinants of Level of Investment – Marginal Efficiency of Capital and Marginal Efficiency of Investment, Neo-Classical and Keynesian Theories of Interest.

Module – IV: Supply of Money & Demand for Money:

Functions and Classification of Money – Money Supply – Measures of Money Supply with reference to India: M1, M2, M3 and M4 – Classical Theories of Money: Fisher's and Cambridge Versions of Quantity Theory of Money – Keynes' Theory of Money and Prices.

Module– V: Inflation & Trade Cycles:

Inflation: Concept, Types, Causes and Measurement – Effects of Inflation – Measures to Control Inflation – Concepts of Phillips Curve, Deflation and Stagflation – Trade Cycles: Concept,Causes and Phases of trade cycle.

SEMESTER-III

ECONOMICS OF INSURANCE – I

SKILL ENHANCEMENT COURSE-I

Credits : 2 **TOTAL HOURS : 30**

CO1. Understand in details with examples of Insurance
CO2. Deliberate in depth Life Insurance
CO3. Understand in depth Health Insurance
CO4. Deliberate in depth pension strategies.
CO5. Specify the details of concepts of pension planning.

Module – I : Introduction :

Meaning and Types of Insurance: Life Insurance and importance of its Policies. General Insurance- Types of Non- Life Insurance and Marketing of General Insurance- Features of Health Insurance, Fire Insurance. Investments in Insurance – Tax Advantaged and Non-Tax Advantaged Insurance.

Module – II : Essentials of Individual Retirement Planning :

Analysis of Retirement; Income Needs; Retirement Planning Strategies; Investing for Retirement, Pension Plans; Basic Principles of Pension Plans; Pension Plans in India. Life Insurance for Estate Liquidity.

SEMESTER-III

STATISTICS FOR ECONOMICS

Discipline Specific Course –Paper – III

Number of Credits: 5 **Total Hours: 90**

Course outcome
On completion of the Course, students will:
CO1. Understand the classification and characteristics of Population Census versus Sample Survey.
CO2. Specify the details of Measures of Central Tendency
CO3. Learn about the Measures of Dispersion.
CO4. Understand in depth Karl Pearson Method
CO5. Learn in details with application, Index Numbers
CO6: Learn the details of Introduction to Time series.

Course Description:
This course introduces the student to collection and presentation of data. Discusses how data can be summarized and analyzed for drawing statistical inferences.

Module– I: Meaning and Basic Concepts of Statistics:

Population and Sample, Frequency Distribution Introduction to Statistics, Cumulative Frequency – Graphic and Diagrammatic Representation of Data –Types of Data: Primary and Secondary Data –Methods of Collecting Data: Census and Sampling Methods (Random, Non-random Sampling Methods)

Module– II: Measures of Central Tendency and Dispersion Measures of Central Tendency:

Mean, Median, Mode – Properties of Good Average – Comparison of Different Averages – Measures of Dispersion, Absolute and Relative Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Variation and Variance.

Module– III: Correlation and Regression:

Meaning and Types – Karl Pearson's Correlation Co-efficient – Spearman's Rank Correlation –Regression: Meaning and Uses of Regression.

Module– IV: Index Numbers:

Aspects and Difficulties in the Construction of Index Numbers - Types of Index Numbers: CPI and WPI – Methods of Index Numbers - Laspayer, Paasche and Fisher.

Module– V: Analysis of Time Series:

Meaning and Uses – Components of Time Series Analysis: Secular, Seasonal, Cyclical and Irregular Variations – Methods of Measurement of Secular Trends: Graphic, Semi-Averages, Moving Averages.

SEMESTER-IV, ECONOMICS OF INSURANCE - II
SKILL ENHANCEMENT COURSE-II

Credits : 2 **TOTAL HOURS : 30**

CO1. Understand in details with examples Insurance as financial intermediaries.
CO2. Deliberate in depth Insurance as investment.
CO3. Understand in depth Insurance regulation.
CO4. Learn in details with examples role of insurance in capital markets.

Module – I : Role of Risk-Management and Insurance
Insurance Institutions as Financial Intermediaries; Insurance Institutions as Investment Institutions; Insurance in Indian Capital Market.

Module – II : Regulation of Insurance
Purpose of Government Intervention in Markets; Insurance Regulation in India; Insurance Regulation & Development Authority; setup and Management of Insurance Companies.

SEMESTER-IV
INDIAN ECONOMY
Discipline Specific Course –Paper – IV

Number of Credits: 5 **Total Hours: 90**

Course outcome
On completion of the Course, students will:
CO1. Understand the characteristics of Indian economy.
CO2. Identify the classification and characteristics of Indian Agriculture.
CO3. Write down the classification and characteristics of New Industrial Policy.
CO4. Specify in depth Public and Private Sector.
CO5. Identify in depth the details of Planning Commission and NITI Ayog.
CO6. Understand in depth the new economic reforms.
CO7. Identify the details of Liberalisation, Privatisation and Globalisation.

Course Description:
This course examines sector-specific trends in key indicators and their implications in the post-Independence period.

Module – I : Structure of the Indian Economy

Indian Economy at the time of Independence. Changes in the composition of National Income and Employment; Natural Resource Base: Land, Water, Forest, Mineral and Metal Resources; Sustainable Development.

Module – II : Indian Agriculture

Importance and Role of Agriculture. Trends in Agricultural Production and Productivity. Land Reforms. Green Revolution. Agricultural Finance. Agricultural Marketing. Agricultural Price Policy. Food Security in India.

Module – III : Indian Industry and Service Sector

Structure, Growth and Employment of Industry; Industrial Policy Resolutions : 1948, 1956, 1991; Growth and Problems of Small Scale Industries; Service Sector- Growing and Importance of Service Sector in India (Education, Health).

Module – IV : Planning in India

Meaning & Definition- Need of Planning – Types of Planning. Five – Year Plans: Objectives, Strategies, Resource Allocation; Evaluation and Performance of The Indian Economy Under Planning; NITI Ayog.

Module – V : Economic Reforms and Globalisation

New Economic Reforms: Liberalisation, Globalisation, Privatisation and their Implications in India.

SEMESTER-V

BASICS OF QUANTITATIVE METHODS FOR ECONOMISTS - I
SKILL ENHANCEMENT COURSE – III

Credits : 2 **TOTAL HOURS: 30**

CO1. Understand in details with examples of Constants and Variables.
CO2. Deliberate in depth Functions.
CO3. Understand in depth rules of differentiation.
CO4. Deliberate in depth concepts of Matrices.

Module- I: Basic Concepts:

Need for Quantitative Methods in Economics, Basic Concepts: Constant,Variables.Functions: Linear, Non-Linear functions. Equations and their functions. Linear, Quadratic. Concept of Derivative, Rules of Differentiation. MR, MC, MPC, Price and Income Elasticities.

Module- II: Determinants and Matrices

Determinants and their Basic Properties. Matrices and Types: Rectangular Matrix, Square Matrix, Row Matrix, and Column Matrix. Operations: Matrix Addition, Subtraction and Multiplication. Inverse of a Matrix and their application.

SEMESTER-V, **TELANGANA ECONOMY**

GENERIC ELECTIVE (or) INTER-DISCIPLINARY COURSE - I

Credits : 2 **TOTAL HOURS: 30**

On completion of the Course, students will:
CO1. Identify in details about the State Domestic Product
CO2. Learn the characteristics of Population policy.
CO3. Identify the details of worker participation.
CO4. Understand the details of Unemployment.

Module- I: State and District Domestic Product

Growth and Sectoral Composition-Per capita Income of Telangana States and its Districts

Module- II: Trends in Population Growth:

Occupational structure work participation – Population policies, Unemployment and its magnitude and direction.

SEMESTER-V, **DEVELOPMENT ECONOMICS**, Discipline Specific Course - Paper –V

Number of Credits: 5 **Total Hours: 90**

Course outcome

On completion of the Course, students will:

CO1. Learn in depth Understand the concept of Economic development and factors that affect Development.

CO2. Deliberate in details with examples differentiate between Economic development and growth.

CO3. Identify the characteristics of Economic Development.

CO4. Understand the Rodan's and Lewis' theories of Development.

CO5. Identify the details of theories of Under development.

CO6. Deliberate in depth of Balanced and Unbalanced Growth theory.

Course Description:

This course reviews major trends in aggregate economic indicators of economic development, factors in economic development and theories of economic development and growth

Module – I : Economic Development and Growth

Concepts of Economic Growth and Development Measurement of Economic Development: Per Capita Income, Basic Needs, Physical Quality of Life Index, Human Development Index and Gender Empowerment Measure.

Module – II : Factors in Economic Development

Factors Effecting Economic Development – Characteristics of Developing Countries – Population and Economic Development – Theories of Demographic Transition. Human Resource Development and Economic Development.

Module – III : Theories of Economic Development

Adam Smith Theory, David Ricardo Theory, Karl Marx Theory and Schumpeter Theory .

Module – IV : Theories of Under Development

Rodan's Bigpush Theory and Lewis Theory of Abundant Labour Supplies.

Module – V : Theories of Balanced and Unbalanced Growth

Concepts of Balanced and Unbalanced Growth. Ragner Nurkse's Balanced Growth Strategy, Hirschman's Unbalanced Growth Strategy. Leibenstein's Critical Minimum Effort Theory.

SEMESTER-V, **INDIAN ECONOMY**, Discipline Specific Elective - Paper - IA

Number of Credits: 5 **Total Hours: 90**

Course outcome
On completion of the Course, students will:
CO1. Understand the characteristics of Indian economy.
CO2. Identify the characteristics of Indian agriculture and Marketing policies.
CO3. Write down the classification and characteristics of New Industrial Policy.
CO4. Specify in depth Public and Private Sector.
CO5. Identify in depth of New Economic Reforms.
CO6. Understand in depth LPG Policies.

Course Description:
This course examines sector-specific trends in key indicators and their implications in the Indian Economic development.

Module – I : Structure of the Indian Economy

Indian Economy at the time of Independence. Changes in the composition of National Income and Employment; Natural Resource Base: Land, Water, Forest, Mineral and Metal Resources; Sustainable Development.

Module – II : Indian Agriculture

Importance and Role of Agriculture.Trends in Agricultural Production and Productivity.Land Reforms.Green Revolution.Agricultural Finance.Agricultural Marketing.Agricultural Price Policy. Food Security in India.

Module – III : Indian Industry and Service Sector

Structure, Growth and Employment of Industry; Industrial PolicyResolutions : 1948, 1956, 1991;Growth and Problems of Small Scale Industries; Service Sector- Growing and Importance of Service Sector in India (Education, Health).

Module – IV : Planning in India

Meaning & Definition- Need of Planning – Types of Planning. Five – Year Plans: Objectives, Strategies, Resource Allocation; Evaluation and Performance of The Indian Economy Under Planning; NITI Ayog

Module – V : Economic Reforms and Globalisation

New Economic Reforms: Liberalisation, Globalisation, Privatisation and their Implications in India.

SEMESTER-V, **FINANCIAL ECONOMICS**, Discipline Specific Elective – Paper – IB

Number of Credits: 5 **Total Hours: 90**

Course outcome
On completion of the Course, students will:
CO1. Learn in depth the Financial system in India.
CO2. Learn in details with examples the working of Commercial banks.
CO3. Deliberate the concepts of money market.
CO4. Understand the details of Capital Markets.
CO5: Specify the details of Industrial finance.

Course Description:
This course introduces students to the economics of finance, essential aspects of financial system. The course will impart skills that will be useful in a variety of business settings including investment banks, asset management companies and in the field of financial system.

Module – I : The Financial System

The financial system and its Significance for Economic Development - The Structure of the Financial System in India –Functions of Finance, Finance Planning, All India Development Financial Institutions, Investment Institutions, Specialized Financial Institutions and State Level Financial Institutions.

Module – II : Commercial Banking

Banking Structure in India – Role of Commercial Banks, Context, Need and Objectives- Financial Sector Reforms – Narasimham Committee Report-I – Financial Sector Reforms with Reference to Stock Markets.

Module – III : Money Market

Organized Sector of the Money Market and their Sub-Markets- Call Money Market, Treasury Bill Market, The Repo Market, Commercial Paper Market and Money Market Mutual Funds and their Instruments- Money Market Reforms in India.

Module – IV : Capital Market

Structure of Capital Market – Primary and Secondary Markets – New Issues and Secondary Issues Markets, Securities – Private and Guilt Edged Securities.

Module-V: Industrial Finance

Structure and Growth of Industrial Financial Institutions. IFCI, IDBI, ICICI and SFCs.

SKILL ENHANCEMENT COURSE – IV
SEMESTER-VI, **BASICS OF QUANTITATIVE METHODS FOR ECONOMISTS - I**

Credits : 2 **TOTAL HOURS: 30**

CO1. Understand in details with examples of Data collection.
CO2. Deliberate in depth Measures of Central tendency.
CO3. Understand in depth Measures of dispersion.
CO4. Learn in details with examples types of Correlation
CO5. Deliberate in depth uses of Regression.

Module- I: Measures of Central Tendency:

Statistics, Definition, Uses and Limitations. Types of Data: Primary and Secondary, Methods of Collecting Data: Census and Sampling Methods. Measures of Central Tendency: Mean Median and Mode. Measures of Dispersion: Range, Quartile Deviation and Standard Deviation.

Module- II: Correlation and Regression:

Correlation: Meaning, Types. Karl Pearson's Correlation Co-efficient, Spearmen's Rank Correlation. Regression: Meaning, Uses of Regression Analysis.

GENERIC ELECTIVE (or) INTER-DISCIPLINARY COURSE - II
SEMESTER-VI, **ECONOMICS OF ENVIRONMENT**

Credits : 2 **TOTAL HOURS: 30**

Course outcome
On completion of the Course, students will:
CO1. Deliberate in details with examples theory of Market failure.
CO2. Understand the details of theories of Environmental Economics..
CO3. Understand in details with examples Implementation of Environmental Policy
CO4. Identify in details of theories of Natural Resource Management.
CO5. Deliberate the characteristics of Sustainable Development.

Course Description:
This course introduces students to concepts, methods and policy options in managing the environment by understanding various theories of Environment. This course examines the concept of Sustainable development.

Module-I: Meaning & definition of Environment Economics

Meaning and definition of Environmental Economics. Theory of Market Failure. Theories of Environmental Economics: Boulding's Spaceship Earth. Hardin's Tragedy of the Commons, Club of Rome Model.

Module-II: Theories of Natural Resource Management

Material Balance and Entropy Law. Hostelling's Theory of Exhaustible Resources. Dasgupta and Heal, Optimal Depletion of Renewable Resources. Carrying Capacity of the Environment. Definition and Concept of Sustainable Development. Week vs. Strong Sustainability Criteria.

SEMESTER-VI, **INTERNATIONAL ECONOMICS**
Discipline Specific Course – Paper –VI

Number of Credits: 5 **Total Hours: 90**

CO1. Understand in details with examples of theories of International trade.
CO2. Deliberate in depth Balance of payments.
CO3. Understand in depth concept of tariffs.
CO4. Learn in details with examples of Quotas.
CO5. Deliberate in depth CO6. Specify the details of concepts of Marginal cost and Marginal revenue
CO7. Understand the details of Foreign trade.
CO8. Learn in depth the details of international organisations i.e, IMF, WTO and World Bank.

Module – I : Introduction

International Economics- Meaning and Scope; Inter regional and International Trade, Advantages and Disadvantages of International Trade, Free Trade, Protection Policies.

Module – II : Theories of International Trade

Theories of Absolute Advantage, Comparative Advantage, Haberler's Opportunity Costs and Hecksher-Ohlin Theory of International Trade.

Module – III : Terms of Trade and Tariffs, Quotas

Gains from Trade – Trade as an Engine of Economic Growth. Concepts of Terms of Trade – Factors affecting Terms of Trade, Tariffs, Quotas, Optimum Tariff;

Module – IV :Balance of Payments

Concepts and Components of BOP, Equilibrium and Disequilibria in Balance of Payments, Types of Disequilibria. Remedial Measures to Control Disequilibrium.

Module – IV :Foreign Trade in India

Role of International Monitory Agencies-IMF,IBRD.WTO in India and its impact on Indian Trade; Multi-National Corporation's (MNC's), FERA & FEMA.

SEMESTER-VI, **ECONOMICS OF INSURANCE**, Discipline Specific Elective-Paper-IIA

Number of Credits: 5 **Total Hours: 90**

CO1. Understand in details with examples Concepts of Life insurance.
CO2. Deliberate in depth Health Insurance.
CO3. Understand in depth pension plans
CO4. Learn in details with examples of Retirement planning.
CO5. Deliberate in depth about Insurance regulation.

Module – I : Introduction
Meaning and Types of Insurance: Life Insurance and importance of its Policies. General Insurance- Types of Non- Life Insurance and Marketing of General Insurance- Features of Health Insurance, Fire Insurance. Investments in Insurance – Tax Advantaged and Non-Tax Advantaged Insurance.

Module – II : Essentials of Individual Retirement Planning
Analysis of Retirement; Income Needs; Retirement Planning Strategies; Investing for Retirement, Pension Plans; Basic Principles of Pension Plans; Pension Plans in India. Life Insurance for Estate Liquidity.

Module – III : Role of Risk-Management and Insurance
Insurance Institutions as Financial Intermediaries; Insurance Institutions as Investment Institutions; Insurance in Indian Capital Market.

Module – IV : Regulation of Insurance
Purpose of Government Intervention in Markets; Insurance Regulation in India;

Module – IV : Role of IRDA
Insurance Regulation & Development Authority; Setup and Management of Insurance Companies.Role of IRDA in Growth of Insurance in India.

SEMESTER-VI

INDUSTRIAL ECONOMICS

Discipline Specific Elective-Paper-IIB

Number of Credits:4 **Total Hours: 90**

CO1. Understand in details with examples of classification of Industries.
CO2. Deliberate in depth market structure.
CO3. Understand in depth market performance.
CO4. Learn in details of Industrial policy.
CO5. Deliberate in depth about LPG.
CO6. Specify the details of concepts of Industrial finance.
CO7. Understand the details of meaning and types of markets. .
CO8. Learn in depth types of Imperfect Competition.

Module – I : Meaning and Classification of Industries

Use-Based, Resource Based and ASI Two and Three Digit Classification. Industrial Location Theories : Weber, Sargent Florence and Losch – Factors Affecting Industrial Location.

Module – II ; Market Structure and Market Performance

Types of Markets Based on Place, Time and Competition. Concepts and Organization of a Firm.-Market Structure; Sellers Concentration; Product Differentiation; Entry Conditions; Economics of Scale.

Module – III : Industrial Pattern under Five Year Plan

Industrial Economic Concentration and Remedial Measures. Industrial Policy 1991: Role of Public and Private Sector, LPG Program. Recent Trends in Industrial Growth.

Module – IV : Industrial Finance

Industrial Finance: Owned, External and other Components of Funds; Role, Nature, Volume and Types of Institutional Finance – State Level Financial Institutions and Commercial Banks.

GOVERNMENT DEGREE COLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD

Re-Accredited with 'B^{+}' Grade by NAAC

CHOICE BASED CREDIT SYSTEM

(CBCS)

BOARD OF STUDIES IN GEOGRAPHY

For

B A /B Sc GEOGRAPHY I YEAR

UNDER GRADUATE PROGRAMME

IN

DEPARTMENT OF GEOGRAPHY

Under MOOCS/Virtual classrooms

(w.e.f. 2019-20, 2020-21)

Faculty of Social Sciences

B.A./B.Sc Geography under MOOCs/Virtual Classrooms

GDCW (A), Begumpet, Hyderabad

Scheme for CBCS in BA/B.Sc Geography

Course Type	Course Title	Hours per Week	No. of Credits
Semester-I			
DSC 1	Elements of Geomorphology	4 T	4
Practical-I	Elements of Mapping and Interpretation	3 P	1
Total		**7**	**5**
Semester-II			
DSC 2	Elements of Climatology and Oceanography	4 T	4
Practical – II	Basic statistics and weather maps	3 P	1
Total		**7**	**5**
Semester-III			
DSC 3	Human Geography	4 T	4
Practical – III	Maps and Diagrams	3 P	1
SEC - 1	Travel and Tourism	2	2
SEC - 2	Surveying Techniques and Cartography	2	2
Total		**11**	**9**
Semester-IV			
DSC 4	Economic Geography	4 T	4
Practical – IV	Map Projections	3 P	1
SEC - 3	Remote Sensing and GPS	2	2
SEC - 4	Fundamentals of GIS	2	2
Total		**11**	**9**

Programme outcomes

After completing the graduation in BA Geography as optional subject the students are able to:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes

After completion of BA in Geography students will:

- Understand theoretical and practical aspects of Economics and Geography
- Evaluate Economic behavior inconsonance with Geographical factors
- Suggest the policy makers about desirable changes to be made in Micro and MacroEconomic issues based on geographical factors
- Gain ability to understand the economic problems in Geographical indicators
- Able to offer palatable solutions for economic and geographical challenges
- Attain Proficiency to analyze the economic decision of Government and non-Govt. Entities that correlate with Geographical factors
- Gain requisite knowledge to evaluate land use pattern and demographical profile
- Apply GIS for understanding Market situation, Transport problem change in Weather Condition, Cropping Pattern, and Natural Calamities and so on

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD
(Re-accredited by NAAC with "B" Grade)
B. A/B.Sc. I year, Revised Semester wise Syllabus (w. e. f. 2019-20)
Subject: Geography
Semester – I
Paper - I: **Elements of Geomorphology**

Course Outcome:

- Learn the details of theories regarding origin and evolution of the Earth system
- Comprehend the details of theories disclosing changes on earth's crust
- Understand the classification and characteristics of Composition of the Earth
- Learn about the intrusive forces of the earth such as earthquakes, volcanoes etc.
- Learn in details about extrusive forces with examples geomorphic agents

UNIT-I:

1. Land and Sea: Formation and distribution
2. Theories: Isostasy, Continental Drift, Plate Tectonics

UNIT-II**:**

3. Interior of Earth
4. Earthquakes
5. Volcanoes
6. Rocks
7. Weathering
8. Mass-wasting

UNIT-III:

9. Fluvial Landforms: Erosion and Depositional
10. Aeolian landforms: Erosion and Depositional

UNIT-IV:

11. Karst topography: Erosion and Depositional
12. Glacial topography: Erosion and Depositional

Basic Texts:

1. Critchfield (1997): General Climatology, Prentice Hall of India, New Delhi.
2. Strahler A. H. and Strahler A.N. (1971): Physical Geography, Willey eastern, New Delhi.
3. Trewartha (1968): An Introduction to Climate, Mc Graw Hill, New Delhi.

Additional Texts:

4. Tikka R. N. (1999): Physical Geography, Kedarnath & Ramnath &Co., Meerut.
5. Dasgupta and Kapoor (1998): Physical Geography, Chand & Co., New Delhi.
6. Lal, D.S. (1996): Climatology, Chaitanya Publishing House, Allahabad.
7. Savinder Singh (2013): Geomorphology, Prayag Pustak Bhavan, Allahabad.
8. Sparks B.W. (1965): Geomorphogy, Brill Academic Publishers.

PRACTICAL – I: ELEMENTS OF MAPPING

1. Maps: Types – Cadastral – Topographical – Atlas – General Maps – Thematic Maps

2. Scales: Classification – Statement – Representative Fraction (R.F.) – Construction of Linear – Diagonal Scales

3. Representation of Relief – Spot heights, Bench marks, Layer colouring, Contours – Hachures and Hill shading, contours drawing.

4. Profile drawing and Interpretation: Simple Profile – Composite profile – Super imposed profile – Projected profile

5. Interpretation of topographical sheets

Basic Texts:

1. Monkhouse,F.J. and Wilkinson,H.R. (1968) Maps and Diagrams, Methuen, London.
2. Misra,R.P. and Ramesh,A (1999) Fundamentals of Cartography, Mac Millan, New Delhi.

Additional Texts:

1. Gopal Singh, (1996) Map Work and Practical Geography, Vikas Publishing House, New Delhi.
2. Singh,R.L. and Dutt,P.K. (1968) Elements of Practical Geography, Students Friends, Allahabad.
3. Negi,B.S. (1998) Practical Geography, Kedarnath and Ramnath, Meerut.

Semester – II

Paper - II: **Climatology and Oceanography**

Course Outcome:

- Understand in details with application, if applicable, atmospheric structure and composition
- Learn in details regarding temperature distribution, global pressure systems, wind systems etc.
- Understand in details with application, if applicable, relief of the ocean floor
- Learn the details of theories regarding origin of sea waves and ocean currents.

UNIT-I: (Climatology)

1. Atmosphere: Structure and Composition

2. Insolation: Factors influencing the incidence and distribution
3. Temperature: Horizontal and Vertical Distribution
4. Pressure: Influencing factors – High and Low Pressure Areas, Global Pressure Belts

UNIT-II:

5. Winds: Local, Periodic and Planetary
6. Cyclones – Formation, Distribution and Impacts: Tropical and Temperate
7. Humidity: Absolute and Relative
8. Clouds: Types, Formation and Potentials
9. Precipitation: Types, Formation, Distribution

UNIT-III: (Oceanography)

10. Submarine Relief: Continental Shelf, Continental Slope, Abyssal Plain, Ocean Deeps and Trenches, Mid-Oceanic ridges
11. Temperature: Horizontal and Vertical Distribution
12. Salinity: Factors and Distribution

UNIT-IV:

13. Waves and Tides: Types and Formation
14. Ocean Currents: Types and Factors Responsible - Currents of Atlantic, Pacific and Indian Oceans
15. Ocean deposits – Types and Distribution
16. Marine Resources and their economic significance

Reference Books:

1. Cole and King (1975): Oceanography for Geographers, E. Arnold, London.
2. Ken Briggs (1985): Physical Geography: Process and System, Holder and Stoughton, London.
3. Rice R.J. (1996): Fundamentals of Geography Addission – Wesley.
4. Sharma, R.C. and Vatal M. (1997): Oceanography for Geographers, Chaitanya Publishing House, Allahabad.

PRACTICAL – II: BASIC STATISTICS AND WEATHER MAPS (1 Credit)

1. Sources of date, classification and Tabulation of data.
2. Central tendencies – Mean, median and mode
3. Measure of Dispersion – mean deviation and standard deviation
4. Correlation – Karl Pearson and spearman.
5. Weather map: weather symbols and interpretation of Indian daily weather maps.

REFERENCES:

1. Aslam Mohmood: Statistical Methods in Geographical Studies. Rajesh Publication, New Delhi.

2. Singh, L.R. (2006): Practical Geography, Sharada Pustak Bhavan.
3. Gregory, S (1963): Statistical Methods and the Geographer, Longmans, London
4. King, L.J.: Statistical Analysis in Geography, Prentice Hall, Englewood Cliffs, New Jersey.
5. Zamir, A. (2002): Statistical Geography: Methods and Applications, Rawat Publications, Jaipur.
6. Monkhouse, F. J. and Wilkinson, F.J. (1985): Maps and Diagrams. Methuen, London
7. Sarkar, A. K. (1997): Practical Geography: A Systematic Approach. Orient Longman, Kolkata.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
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BEGUMPET, HYDERBAD
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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography

Course Outcome

- Write down the details of human geography importance
- Deliberate in details with examples race, religion and language study
- Specify the details of demographic age transition study
- Understand in details with application, if applicable, population composition
- Learn in details with application, if applicable, human settlement study

Semester – III
Paper – III: **Human Geography**

UNIT-I:
1. Nature and objectives of Human Geography
2. Man and Environment- Physical and Cultural environment

UNIT-II:
3. Human Activities – Primary, Secondary, Tertiary and Quaternary
4. Resources- Classification, Conservation, Utilization and Management, Sustainability

UNIT-III:
5. Human Races- Origin, Classification, Characteristics and Distribution
6. Cultural Realms of the World
7. Population-World population, Growth and Distribution, Demographic Transition.

UNIT-IV:

8. Human Migration- Types, Causes and Consequences of migration, Indian Diaspora.
9. Human Settlements: Forms, Structure, Functions and Patterns, Rural and Urban Settlements.
10. Urbanization- Impacts of Urbanization.

REFERENCES:

1. Leong G.C. and Morgan C.C. (1975): Human and Economic Geography, Oxford University Press, London.
2. Alexander J.W. (1963): Economic Geography, Prentice Hall, New Delhi.
3. Hartshorn T.A. and Alexander (1988): Economic Geography, Prentice Hall, New Delhi.

Additional Text Books:

4. Majid Hussain (1999): Human Geography, Rawat Publications, Jaipur.
5. Ghosh B.N. (1995): Fundamentals of Population Geography, Sterling Publishers, Bangalore.
6. Guha J.L. and Chatoraj P.R. (1978): Economic Geography, World Press, Kolkata.
7. Bhende A.A. & Kanitkar T. (2006): Principles of Population Studies, Himalaya Publishing House, Hyderabad.

Practical – III: Maps and Diagrams

1. One Dimensional – Line Graph, Poly Graph, Bar Graph, Pyramid Graph, Pie Diagram.
2. Two Dimensional – Squares and Rectangles
3. Three Dimensional – Spheres and Blocks, Climatic Diagrams, Climograph, Hythergraph, Windrose.
4. Thematic Maps: Class intervals, Choropleth, Isopleth, Dot Maps, Flow Maps.

Basic Texts

1. Monkhouse F.J. and Wilkinson H.R. (1968): Maps and Diagrams, Methuen, London.
2. Robinson A.H. et al (1995): Elements of Calligraphy, John Wiley, New York.

Additional Texts

3. Singh R.L. and Dutt P.K. (1968): Elements of Practical Geography, Students Friends, Allahabad.
4. Misra R.P. and Ramesh A. (1989): Fundamentals of Cartography, Concept, New Delhi.

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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography
Semester – III
SEC - 1: Travel and Tourism

Course outcomes:

- Learn in depth geography of tourism concepts
- Specify in details with examples types of tourism
- Identify in details with application, if applicable, impact of tourism
- Understand the details of tourism in India

UNIT-I:

1. Types of Tourism – Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage.
2. Recent Trends of Tourism – International and Regional, Domestic (India), Eco-Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE).

UNIT-II:

3. Travel Formalities – Travel Agency and Tour Operation Business, Functions.
4. Tourism in India: Tourism Infrastructure; Case Studies of Himalayas, Desert and Coastal and Heritage, National Tourism Policy.

Reading List:

1. Dhar, P.N. (2006) International Tourism: Emerging Challenges and Future Prospects, Kanishka, New Delhi.
2. Hall, M. and Stephen, P. (2006) Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
3. Kamra, K. K. and Chand, M. (2007) Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.
4. Page, S.J. (2011) Tourism Management: An Introduction, Butterworth Heinemann – USA, Chapter 2.
5. Raj, R. and Nigel, D. (2007) Morpeth Religious Tourism and Pilgrimage Festivals Management: An International Perspective by, CABI, Cambridge, USA.

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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography
Semester – III
SEC - 2: Surveying Techniques and Cartography

Course Outcomes:

- Understand in details with application, if applicable, evolution of surveying
- Write down in details of classification and procedures of types of surveying
- Understand in details with application, if applicable, evolution of cartography
- Write down in details with examples map scale
- Understand the details of representation of date

UNIT-I:

1. Surveying: Chain Survey – Triangulation Method, Open & Closed Traverse.
2. Prismatic Compass Survey- Open & Closed Traverse, Intersection Method.
3. Plane Table Survey – Intersection Method.

UNIT-II:

4. Maps: Map Scale – Types and Application, Reading distances on a map.
5. Representation of Data – Symbols, Dots, Choropleth, Isopleth and Flow Diagrams, Interpretation of Thematic Maps.

Basic Texts:

1. Monkhouse F. J. and Wilkinson M.R. (1963): Maps and Diagrams, Methuen, London.
2. Misra R.P. and Ramesh A. (2015): Fundamentals of Cartography, Concept, New Delhi.
3. Robinson A. H. (1995): Elements of Cartography, John Willey, New York.

Additional Texts:

4. Gopal Singh (1996): Map Work and Practical Geography, Vikas Publishing, New Delhi.
5. Negi B. S. (1998): Practical Geography, Kedarnath and Ramnath, Meerut.

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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography
Semester – IV

Course outcome

- Identify the classification and characteristics of concepts of economic geography
- Understand the characteristics of locational theories
- Understand in depth study of primary activities
- Learn the details of study of secondary activities
- Write down in details with examples study of tertiary and quaternary activities

Paper - IV: **Economic Geography**

UNIT-I:

1. Definition, Approaches and Fundamental Concepts, Patterns of Development.
2. Types of Agriculture: Land use, Cropping Patterns and Production, Location Model of Von Thunen.
3. Livestock- Development and Distribution, Animal Products (Dairying, Meat and Wool).

UNIT-II:

4. Fisheries: Major Fishing areas of the World, Production and Trade
5. Forest: Types and Distribution, Forest Products, Wild Life.
6. Minerals: Metallic (Iron ore, Copper), Non-metallic (Limestone and Mica), Fuel (Coal, Petroleum and Natural Gas).

UNIT-III:

7. Industries: Locational Factors, Weber's Industrial Location Theory.
8. Major Industries: Iron & Steel, Cotton Textiles and Information and Communication Technology Industry.
9. Industrial Regions of the World- Changing pattern.

UNIT-IV:

10. Transport: Roadways, Railways, Waterways and Airways.
11. Trade: International Trade, Major Imports and Exports, Balance of Trade.
12. WTO and Developing countries.

Basic Texts:

1. Leong G.C. and Morgan C.C. (1975): Human and Economic Geography, Oxford University Press, London.
2. Alexander J.W. (1963): Economic Geography, Prentice Hall, New Delhi.
3. Hartshorn T.A. and Alexander (1988): Economic Geography, Prentice Hall, New Delhi.

Additional Texts:

1. Guha J.L. and Chatoraj P.R. (1978): Economic Geography, World Press, Kolkata.

Practical – IV: Map Projections

1. Constructions and Uses.
2. Conical Projections: One Standard Parallel, Two Standard Parallel.
3. Bonne's Cylindrical Projections: Equal Area, Equal Distant.
4. Zenithal Projections (Polar cases only) – Stereographic, Gnomonic, Zenithal Equidistant and Equal Area.

Basic Texts:

1. Monkhouse F.J. and Wilkinson M.R. (1963): Maps and Diagrams, Methuen, London.
2. Misra R.P. and Ramesh A. (1989): Fundamentals of Cartography, Concept, New Delhi.
3. Robinson A. H. (1995): Elements of Cartography, John Willey, New York.

Additional Texts:

1. Gopal Singh (1996): Map work and Practical Geography, Vikas Publishing, New Delhi.
2. Negi B.S. (1998): Practical Geography, Kedarnath and Ramnath, Meerut.

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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography
Semester – IV
SEC - 3: Remote Sensing and GPS

Course Outcomes:

- Understand the characteristics of concept of remote sensing
- Identify in details with examples study of aerial photography
- Specify the details of principals of remote sensing satellites
- Write down the classification and characteristics of interpretation and application of remote sensing
- Deliberate in details with application, if applicable, study of global positing system

UNIT-I:

1. Remote Sensing – Definition, Development, Platforms and Types.
2. Satellite Remote Sensing- Principles, EMR Interaction with Atmosphere and Earth Surface, Satellites (Landsat and IRS) and Sensors.
3. Plane Table Survey – Intersection Method.

UNIT-II:

4. Interpretation and Application of Remote Sensing – Land use/Land cover.
5. Global Positioning System (GPS) – Principles and Uses.

Basic Texts:

1. Compbell J.B., 2007: Introduction to Remote Sensing, Guildford Press.
2. Jensen J.R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
3. Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
4. Lillesand T.M., Kiefer R.W. and Chipman J.W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).

Additional Texts:

5. Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH pub.
6. Wolf P. R. and Dewitt B.A., 2000: Elements of Photogrammetry: With Applications in GIS, Mc Graw Hill.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
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B. A/B.Sc. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)
Subject: Geography
Semester – IV
SEC - 4: Fundamentals of GIS

Course Outcomes:

- Understand in details of the evolution of GIS
- Specify in depth GIS data structures
- Write down in depth GIS data analysis
- Deliberate in details with examples Application of GIS in Land use
- Identify the classification and characteristics of Application of GIS in Urban and Forest monitoring

UNIT-I:

1. Geographical Information System (GIS) – Definition and Components.
2. GIS Data Structures- Types (Spatial and Non-spatial), Raster and Vector Data Structure.

UNIT-II:

3. GIS Data Analysis – Input; Geo-referencing; Editing and Output, Overlays
4. Application of GIS in Land Use/Land Cover, Urban Sprawl and Forests Monitoring.

Basic Texts:

1. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg. 41.
2. Burrough, P.A., and Mc Donnell, R.A. (2000) Principles of Geographical Information System-Spatial Information System and Geo-statistics, Oxford University Press.
3. Chauniyal, D.D. (2010) Sudur Samvedan evam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad.
4. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Information System, Prentice Hall.

Additional Texts:

5. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
6. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

GOVERNMENT DEGREE COLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERABAD

Re-Accredited with 'B' Grade by NAAC

CHOICE BASED CREDIT SYSTEM

(CBCS)

BOARD OF STUDIES IN HISTORY

For

B A HISTORY

UNDER GRADUATE PROGRAMME

IN

DEPARTMENT OF HISTORY

(w.e.f. 2019-20, 2020-21)

Faculty of Social Sciences

GDCW (A), Begumpet, Hyderabad

Scheme for CBCS in BA HISTORY

Year	Semester	DSC/ GE/ DSE/ SEC	Paper	Title	Credits	Hours
I	I	DSC 101	**Paper - I**	**History of India (From Earliest Times to c.700 CE)**	5	5
	II	DSC 201	**Paper – II**	**History of India (c.700 -1526 CE)**	5	5
II	III	DSC 301	**Paper – III**	**History of India (1526-1857 CE)**	5	5
		SEC-I	**Paper-I**	**Historical and Cultural Tourism**	2	2
	IV	DSC401	**Paper - IV**	**History of India (1858-1964 CE)**	5	5
		SEC-II GE	**Paper-II** --- **Open Stream**	**Archives and Museums** --- **Indian National Movement (1857-1947 CE)**	2 --- 4	2 --- 4
III	V					
		DSE-501	**Elective-A** --- **Elective-B**	**History of Modern World (1453-1964 CE)** --- **Tourism and Culture**	5 --- 5	5 --- 5
	VI	DSE601 --- DSE601 --- Optional	**Paper – A** --- **Paper – B**	**History and Culture of Telangana (From Earliest Times to 2014 CE)** --- **Islamic History** --- **Ancient Civilizations**	5 --- 5 --- 4	5 --- 5 --- 4

Programme Outcomes:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyze the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual.

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes:

After completion of BA History students will:

- This Programme exerts it's Influence on life and destiny of Human beings.
- It is a stepping stone for one's success in competitive examinations.
- Understand the background of our religion, customs, institutions and so on.
- Understand the present Social, political, religious and economic conditions of the people.
- Analyze the relationship between the past and the present, is lively presented in the History
- The study of History helps to import moral education and the feeling of patriotism in the hearts of the pupils

GOVERNMENT DEGREE COLLEGE FOR WOMEN
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BEGUMPET, HYDERBAD

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B. A. I year, Revised Semester wise Syllabus (w. e. f. 2019-20)

Subject: **History**

Semester - I

Paper – I: History of India (From Earliest Times to c.700 CE)

Course Outcome:

On completion of the course, students will:

- Learn in details with examples Pallavas of Kanchi
- Learn in depth development of urban centres
- Learn the characteristics of Mauryan empire
- Understand in depth trade routes
- Understand in details with examples Art and architecture

Module-I: Definitions - Nature and Scope of History - History and Its Relationship with other Social Sciences - Geographical Features of India – Sources of Indian History: Pre-History – Paleolithic, Mesolithic, Neolithic, Chalcolithic and Megalithic Cultures.

Module-II: Indus Valley Civilization - Its Features & Decline; Early Vedic and Later Vedic Civilizations – Vedic Literature – Society – Economy - Polity – Religion.

Module-III: Rise of New Religious Movements – Charvakas, Lokayathas, Jainism and Buddhism; Mahajanapadas - Rise of Magadha; Alexander's Invasion and Its Impact.

Module-IV: Foundation of the Mauryan Dynasty; Ashoka and His Dharma – Polity – Administration - Society – Economy – Religion – Literature - Art and Architecture; Disintegration of the Mauryan Empire; Post-Mauryan Kingdoms - Indo-Greeks - Kushanas and Kanishka - Society – Economy – Literature – Art and Architecture; The Satavahanas; Sangam Age – Literary Development.

Module-V: Gupta Empire: A Brief Political Survey - Polity and Administration, Social and Economic Conditions, Agriculture and Land Grants - Feudalism, Caste System, Position of Women, Education, Literature, Science and Technology, Art and Architecture - Harshavardana and His Achievements.

Recommended Books:

A.L. Basham, *The Wonder that was India*, Rupa & Co., New Delhi, 2001.
Allchin, Bridget & Raymond, *The Rise of Civilization in India and Pakistan*, CUP, New Delhi,1996.
E.H. Carr, *What is History*? Penguin Books, England, 1990.
Majumdar, R.C., *History and Culture of the Indian People*, Vols. I, II & & III. Romila
Thapar, *Asoka and the Decline of the Mauryas*, OUP, New Delhi, 1995.Romila
Thapar, *Early India (From the earliest to AD 1300)*.
Romila Thapar, *A History of India*, Vol. I, Penguin Books, New Delhi, 1990.Upinder
Singh, *A History of Ancient and Medieval India*.

Semester - II
Paper-II: History of India (c.700-1526 CE)

Course Outcome:

On completion of the course, students will:

- Understand the details of Rashtrakutas
- Write down the characteristics of Islamic intellectual traditions
- Identify the classification and characteristics of regional languages and literature
- Identify in depth Merchant guilds of south India

Module-I: The Age of Rajputs Society, Economy and Culture - Rise of Regional States: Pallavas, Chalukyas of Badami, Rashtrakutas, Cholas; Local Self Government under Cholas; Society, Economy, Literature, Art and Architecture; Bhakti Movement in South India: Shaiva Nayanars and Vaishnava Alwars.

Module-II: Arab Conquest of Sind, Ghaznavids and Ghoris; Foundation of Delhi Sultanate: Slave, Khaljis, Tughlaqs, Sayyids and Lodis – Polity, Administration, Society – Religion - Economy - Art and Architecture - Growth of Education and Literature – and the decline of Delhi Sultanate.

Module-III: Bhakti and Sufi Movements Prominent Bhakti and Sufi Saints their Preaching's - Impact on Society and Culture - Emergence of Composite Culture.

Module-IV: Kakatiyas – Polity – Administration - Society and Economy - Literature and Religion – Art and Architecture – Yadavas – Hoysalas and Pandyas – their contribution to South Indian Culture.

Module-V: Vijayanagara – A Brief survey of Political History – Polity - Administration - Society and Economy – Religion – Art and Architecture – Language and Literature - The Brief History of Bahamanis and their Contribution to the Deccan Culture.

Recommended Books:

A.L. Basham, *The Wonder that was India*, Rupa & Co., New Delhi, 2001.

Irfan Habib, *Medieval India-I*, OUP, Delhi, 1999.

K.A. Nilakanta Sastri, *A History of South India*.

Majumdar, R.C., *History and Culture of the Indian People*, Vols. I, II & & III.

Romila Thapar, *Early India (From the earliest to AD 1300)*.

Satish Chandra, *Medieval India (From Sultanate to the Mughals)*, Part-I, Har-Anand Publications, New Delhi, 1997.

Upinder Singh, *A History of Ancient and Medieval India*.

Vipul Singh, *Interpreting Early and Medieval India*.

Telugu:

A. Bobbili and others, *Bharatha Desha Charitra upto A.D. 1526*, Telugu Academy, Hyderabad, 2003.

D.D. Kosambi, *Bharatha Desha Charitra Parichaya Vyasalu*, Hyderabad Book Trust, Hyderabad, 1996.

B.A. First & Second Year *Indian History* Text Books (English & Telugu Medium-CBCS) 2017-18.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A. II year, Revised Semester wise Syllabus (w. e. f. 2020-21)

Subject: History

Semester - III
Paper III: History of India (1526-1857 CE)

Course Outcome:

On completion of the Course, students will:

- Write down the characteristics of Persian and turkish tradition
- Understand in depth Sultanate political structure
- Learn in details with examples Bhakti movement
- Identify the details of Sufi cult
- Understand in details with examples Monetization

Module-I: Establishment of Mughal Dynasty - Sources – Shershah Sur and His Reforms - Brief Survey of Political History of Mughals – Akbar, Shah Jahan and Aurangzeb -Polity - Administration – Society – Economy – Technological Developments - Religion – Hindu-Muslim Relations – Emergence of Composite Culture – Education – Language and Literature – Art and Architecture - Disintegration of Mughal Empire.

Module-II: Rise of Regional Powers - Marathas – Shivaji his Military Achievements, and his Administration – The Rise of Peshwas – and their role in Maratha History - The Third Battle of Panipat – The Rise of Sikhs. – Ranjit Singh – Rise of Princeley States – Hyderabad – Avad - Junagarh – Mysore – Kashmir.

Module-III: Advent of European Powers - Portuguese, Dutch, English and French, Anglo-French Rivalry - Expansion and Consolidation of British Power – Wellesley's Subsidiary Alliance – Dalhousie's Doctrine of Lapse.

Module-IV: Three Stages of Colonialism – Mercantilism - Free Trade Policies – Finance Capital - Land Revenue Settlements – Cornwallis and Permanent Revenue Settlement; Thomas Munroe and Ryotwari; Mahalwari System – Changes in the Agrarian Economy and Condition of Peasantry – Famines.

Module-V: Decline of Rural Cottage Industries and Urban Handicrafts - Growth of Railways, Roads, Communication – Modern Industries – Coal Mines, Textiles, Iron and Steel, etc. - Anti-Colonial Upsurge - 1857 Revolt – Nature, Causes and Results.

Recommended Books:

A.L. Srivastava, *History of India from A.D. 1000 to 1707*.
A.R. Desai, *Social Background of Indian Nationalism*.
Bipan Chandra, *A History of Modern India*.
Harbans Mukhia, *The Mughals*.
John F. Richards, *The Mughal Empire*, CUP, New Delhi, 1995.
R.C. Majumdar (ed.), *A History and Culture of India People*, Bharatiya Vidya Bhavan Series (Relevant Vols.).
R.C. Majumdar, H.C. Raychaudhuri & K. Datta, *An Advanced History of India*, Madras, 1995.
Satish Chandra, *Medieval India*, Vol. II.
Sumit Sarkar, *Modern India (1885-1947)*, Macmillan India Ltd., Madras, 1995.
Tarachand, *A History of the Freedom Movement in India*, Four Volumes.
V.D. Mahajan, *History of Medieval India (Sultanate Period and Mughal Period)*.
V.D. Mahajan, *Modern Indian History*.

Telugu:

B. Laxminarayana Rao, *Bharatadesa Swathantra Charitra* (Part-3), (Trans.), Telugu Academy, 2005.
Bipan Chandra, *Adhunika Bharatadesa Charitra* (Translation Sahavasi), Hyderabad Book Trust.
B.A. First & Second Year Indian History Text Books (English & Telugu Medium-CBCS) 2016-17.
J. Durga Prasad and Others, *Bharatadesa Charitra (1526-1964 A.D.)*, Telugu Academy, 2006.
V. Rama Krishna Reddy, *Bharatadesa Charitralo Mukhya Ghattalu*, Telugu Academy, 2005.

Historical and Cultural Tourism
(SEC - Skill Enhancement Course – I)

The main objective of this course is to make student understand the relevance of Tourism as history and its relationship with culture. This course not only deals with the various aspects of tourism industry but also deals with the impact of tourism. This course also brings out the growing trends in tourism and the demand it is generating in the present times.

Module-I: Tourism – Concept and Meaning – Nature – Scope - Tourism as an Industry - Socio-Economic Impact of Tourism - History of Tourism Development in India - Promotional Strategies of Tourism - Tools of Publicity, Role of Films, Television, Press, Poster-display, Brochures, Role of Guides - Historical Tourism - Monuments, Religious and Secular - Historical Sites - Historical Events - Impact of Tourism Development on Protection and Conservation of Historical Monuments and Sites and Vice-Versa - Socio-Cultural Tourism: Fairs and Festivals of India - Performing Arts (Dance, Drama and Music) - Museums, Art - Galleries, Yoga and Health Centers - Indian Cuisine.

Module-II: Eco-Tourism - Beaches, Hill-Resorts, Surf-Riding, Ballooning, Rafting, Gliding - Wild-life Sanctuaries - National Parks, Safaris, Mountaineering –Trekking – Skiing - Sports Tourism - Tourism in Telangana – Tourist Places - Tourism Handicrafts: Textiles – Metal Work, Stone and Wood Carvings, Furniture, Jewellery, Toys, Musical Instruments – Terracotta - Display and Sale of Handicrafts - Shops at Heritage Centers – Organizing Exhibitions – Duty Free Shops.

Recommended Books:

Dallen, J. Timothy, *Cultural Heritage and Tourism: An Introduction (Aspects of Tourism Texts)*, Channel View Publications, 2011.

INTACH, *Heritage and Development: Recent Perspectives*, Aryan Books International, 2012.

K.R. Gupta, *Concise Encyclopedia of India: (Places of Historical and Tourist Interest)*, 2010.

Melanie, K. Smith, *Issues in Cultural Tourism Studies*, Psychology Press, 2003.

P.N. Girija Prasad, *Eco-Tourism and Its Development*, Adhyayan Publishers, 2012.

S.P. Gupta & Lal Krishna (eds.), *Cultural Tourism in India: Museums, Monuments and Arts*, 2003.

V.K. Singh, *Historical and Cultural Tourism in India*, Aadi Publications, 2008.

Vaibhav Chauhan, *Heritage Tourism: Territory Unexplored*.

Vanaja Uday, *Cultural Tourism and Performing Arts of Andhra Pradesh: Prospects and Perspectives*, Research India Press, 2012.

A.K. Bhatia, *Tourism Development – Principles & Practices*, Sterling Publishers, 2016.

Sampad Kumar, Swain & Jitendra Mohan Mishra, *Principles and Practices in Tourism*, OUP, 2011.

Indira, *Tourism in Andhra Pradesh: Growth and Developments, 1956-2007*, Research India Press, New Delhi, 2014.

D. Satyanarayana, *Kotha Paryataka Sthalalu* (Telugu).

Semester - IV

Paper – IV:History of India (1858-1964 CE)

Course Outcomes:

On completion of the Course, students will:

- Understand in depth Baburs invasion
- Understand in depth of Mughal rule under Akbar
- Learn in details with examples Art and architecture of Mughal
- Learn in depth of Conquest of Bengal

Module-I: Queen's Proclamation – Beginning of Colonial Rule – Introduction of Western Education – Role of Christian Missionaries – Press, Communication and Emergence of Middle Classes - Lytton and Rippon: Impact of their Policies.

Module-II: Socio-Religions Reform Movements – Brahma Samaj - Arya Samaj - Theosophical Society - Ramakrishna Mission - Aligarh Movement; Anti-Caste Movements - Jyotibha Phule - Narayana Guru - Periyar Ramaswamy Naicker and Dr. B.R. Ambedkar.

Module-III: Factors for the Rise of Nationalism – Formation of Indian National Congress – Three Phases of Freedom Struggle: Moderate Phase, Extremist Phase and Gandhian Era - Non-Cooperation, Civil Disobedience and Quit Indian Movement; Indian National Army and Subhash Chandra Bose.

Module-IV: Revolutionary Movement: Gadhar Party – Bhagath Singh – Chandra Sekhar Azad and Others; Left-Wing Movement – Rise of Socialist and Communist Parties - Peasant and Workers Movements.

Module-V: Emergence of Communal Politics and Mohd. Ali Jinnah – Prelude to Partition of India - Sardar Vallabhai Patel and Integration of Princely States into Indian Union – Republic of India – Jawaharlal Nehru and His Policies.

Recommended Books:

A.R. Desai, *Social Background of Indian Nationalism*, Popular Prakashan Pvt. Ltd., Mumbai, 2002.
Bipan Chandra (et.al.), *India's Struggle for Independence*, Penguin Books, Kolkata, 2001.Bipan Chandra, *A History of Modern India*.
Kenneth Jones, *Social and Religious Reform Movements in India*.
R.C. Majumdar (ed.), *A History and Culture of India People*, Bharatiya Vidya Bhavan Series(Relevant Vols.).
R.C. Majumdar, H.C. Raychaudhuri & K. Datta, *An Advanced History of India*, Macmillan, Madras,1995.
S. Gopal, *Jawaharlal Nehru – A Biography*.
Sumit Sarkar, *Modern India (1885-1947)*, Macmillan India Ltd., Madras, 1995.
Tarachand, *A History of the Freedom Movement in India*, Four Volumes.
V.D. Mahajan, *Modern Indian History*.

Telugu:

B. Vijaya Bharati, *Mahatma Jyothirao Phule* (Translation), Hyderabad Book Trust, 2004.
Bhoopati Laxminarayana Rao, *Bharatadesa Swathantra Charitra* (Part – 3), (Translation), TeluguAcademy, 2005.
Bipan Chandra, *Adhunika Bharatadesa Charitra* (Translation Sahavasi), Hyderabad Book Trust.
J. Durga Prasad and Others, *Bharatadesa Charitra (upto 1526-1964 A.D.)*, Telugu Academy, 2006.
V. Rama Krishna Reddy, *Bharatadesa Charitralo Mukhya Ghattalu*, Telugu Academy, 2005.

Semester – IV

Archives and Museums

(SEC - Skill Enhancement Course – II)

Course Outcomes:

On completion of the Course, students will:

- Identify the characteristics of chemical preservation
- Understand in depth digital documentation
- Learn the details of field exploration
- Specify in details with application, if applicable, museums archives and society

This course introduces students to the institutions that house and maintain documentary, visual and material remains of the past. Students will be encouraged to undertake collection, documentation and exhibition of such materials in their localities and colleges. Visit to National Archives and National Museum are an integral part of the course.

Module-I: Definition of Archives – Scope – Types of Archives – Development of Archives – National and State Archives in India - Archives – Understanding the Traditions of Preservation – Collection - Purchase –Documentation: Accessioning – Indexing – Cataloguing – Digital Documentation and De-accessioning - Chemical Preservation and Restoration.

Module-II: Definition of Museum - Introduction – Scope - Types of Museums - Significance of Museums - Museums in India - Museums – Collection – Field Exploration – Excavation – Purchase – Gift and Exchanges – Treasure Trove – Documentation - Indexing – Museum Presentation and Exhibition – Outreach Activities of Museums and Archives.

Recommended Books:

Saloni Mathur, *India by Design: Colonial History and Cultural Display*, University of California, 2007.

Sengupta, S., *Experiencing History through Archives*, Munshiram Manoharlal, Delhi, 2004.

Guha Thakurta, Tapati, *Monuments, Objects, Histories: Institution of Art in Colonial and Post-Colonial India*, New York, 2004.

Kathpalia, Y.P., *Conservation and Restoration of Archive Materials*, UNESCO, 1973.

Choudhary, R.D., *Museums of India and Their Maladies*, Agam Kala, Calcutta, 1988.

Nair, S.M., *Bio-Deterioration of Museum Materials*, Agam Kala Prakashan, 2011.

Agrawal, O.P., *Essentials of Conservation and Museology*, Sundeep Prakashan, New Delhi, 2007.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A. III year, Revised Semester wise Syllabus (w. e. f. 2020-21)

Subject: History

Semester – V

Paper – V:: History of the Modern World (From 1453 CE to 1964 CE)

Course Outcomes:

On completion of the Course, students will:

- Learn the details of The French revolution
- Understand in depth Italian unification
- Understand in depth Napoleon -III
- Learn in depth the UNO
- Learn the classification and characteristics Soviet industrialization
- Learn in depth Formation of the USSR

Unit-I: Decline of Medieval Socio-Political, Religious, Economic conditions - Characteristic features of Renaissance - Significance of Reformation and Counter Reformation movements in Europe - Geographical Discoveries and Rise of Colonialism – Colonization of America - Mercantilism and Commercial Revolution. Emergence of Nation States in Europe – Spain – France – England – Russia – Austria – Italy and Prussia - Nature of Absolute Monarchies and Feudalism in Europe and Asia.

Unit-II: Age of Revolutions – Glorious Revolution (1688) - American Revolution (1776) - French Revolution (1789) – Napoleon – Wars – Reforms- Revolutions of 1830 and 1848 - Industrial Revolution.

Unit-II: Rise of Capitalism – Impact on Asia and Africa – Colonization of Africa - Asia and Latin America - Entry of European Powers in China – Opium Wars – Revolution in China – Boxer Revolt - Sun-Yat-Sen – Mao's Communist Revolution - Meizi Restoration and Modernization of Japan- Unification Movements in Germany and Italy.

Unit-IV: World between 1914-1945 Rivalry among colonial powers Imperialist Hegemony - Causes and consequences of first World War – World between the Wars - League of Nations - Russian Revolution – Causes and consequences. Fascism in Italy, Nazism in Germany, Militarism in Japan – Nationalist and Communist Movements in China - Role of Sun-Yat-Sen and Mao-Tze-Dung.

Unit-V: Causes and consequences of Second World War – UNO, Its Contribution to World Peace – Decolonization and National Liberation Movements in Asia, Latin America and Africa – NAM – its Origin – Aims Importance.

Recommended Books:

Arun Bhattacharjee, *History of Modern Europe*, Vol. II.
C.J.H. Hayes, *Europe since 1870 A.D.*, Vol. II.
C.J.H. Hayes, *Europe upto 1870 A.D.*, Vol. I.
Fischer, *A History of Europe.*
J.M. Roberts, *History of the World*, New York, 1976.
Peter Moss, *Modern World History*, Hampshire, 1978.

Taylor, A.J.P., *The Struggle for Mastery in Europe*.
Thompson, D., *Europe Since Napoleon*.
V.D. Mahajan, *History of Modern Europe since 1789.*
Telugu:
Badriraju Sheshagiri Rao and Others, *Adhunika Prapancha Charitra*, Telugu Academy, 2002.
Y. Vaikuntham., *Prapancha Charitra*, Telugu Academy.

Semester - V

Tourism and Culture

(DSE - Discipline Specific Elective-501 (B) - Paper – V

The main objective of this course is to make student understand the relevance of Tourism as history and its relationship with culture. This course not only deals with the various aspects of tourism industry but also deals with the impact of tourism. This course also brings out the growing trends in tourism and the demand it is generating in the present times.

Course outcomes:
On completion of the Course, students will:

1. To appreciate the significance of Historical Monuments.
2. To cherish the great Indian Heritage.
3. To impart Skills in guideship.
4. To protect and preserve the historical sites and Monuments.

Unit-I: Definition – Meaning, Nature and Scope of Tourism – Concepts: Who is a Tourist, Travellers, Visitor and Excursionist – definitions and differentiation – Types of Tourism: Religious Tourism, Eco Tourism, Rural Tourism, Health Tourism, Adventure Tourism, Historical Tourism, Cultural Tourism.

Unit-II: Historical Dimensions of Tourism Travel and Tourism through the Ages: Early Travels, 'Renaissance' and 'Age of Grand Tours' – Emergence of Modern Tourism, Concept of 'Paid Holiday' – Understanding Tourism Motivations – Concept of Push and Pull Factors in Tourism.

Unit-III: Infrastructure in Tourism: Tourist Transport – Forms & Types: Road-Rail-Sea-Air-Tour Operators – Travel Agency – Planning the Itinerary – Tourist Accommodation – Forms & Types.

Unit-IV Impact of Tourism – Socio-Cultural Impact – Ecological & Environmental Impact – Economic Impact – Multiplier Effect – Political Impact and Government Policies – Tourism as an Industry – Future of Tourism in India.

Unit-V: Development of Tourism in Telangana – Tourist attractions in Telangana Historical Tourism Monuments – Golconda Fort, Qutub Shahi Tombs, Charminar, Mecca Masjid, Chow Mohalla Palace – Warangal – Kakatiya Fort – Thousand Pillar Temple, Ramappa Temple, Yadadri, Vemulavada – Medak Church – Museums – Salar Jung Museum, State Museum, Tribal Museum, Archaeological Museum – Buddhist Heritage – Dhulikatta, Phanigiri – Nelakondapalli – Cultural Tourism – Sammakka – Sarakka Festivals, Bonalu – Batukamma, Tribal Cultures of Adilabad – Handicrafts (Bidri Ware, Pembarti Brass Work, Karimnagar Filigri, Dokra Tribal Craft, Cheriyal Naqash Paintings and Handlooms (Gadwal, Pochampalli) – Eco-Tourism – Nehru Zoological Park, Durgam Cheruvu, Waterfalls.

SUGGESTED READINGS:

Mc. Intosh, Robert, W., *Tourism, Principles, Praces & Philosophies.*.
A.K. Bhatia, *Tourism Development: Its Principles and Practices*.
Ram Acharya, *Tourism in India*.
F.R. Allchin, *Cultural Tourism in India: Its Scope and Development*, Department of Tourism, Government of India, New Delhi.
A.L. Basham, *The Wonder That was India*, Rupa & Company, New Delhi, 1967.
Burkart and S. Medlik, *An outline of Tourism*, Heinemann, London, 1976.
Chris Copper, *Tourism: Principles and Practice*, Harlow Longman, London, 1998.
S. Dharmarajan & Seth, Rabindra, *Tourism in India: Trends and Issues*, New Delhi, 1994.
Kaul, Virendra, *Tourism and the Economy*, Har-Anand Publications, New Delhi, 1994.
Leela, Shelly, *Tourism Development in India: A Study of the Hospitality Industry*, Arihant, Jaipur, 1991.
Satish Babu, *Tourism Development in India*.
Messenger, Rob Allen, *The Economics of Tourism*, Routledge, London, 1997.

P.N. Seth, *Successful Tourism – Planning and Management*, Cross Sections Publications, New Delhi, 1979.
K.S. Subrahmaniam, *Buddhism in South India and Early History of Andhra*, Kondal Publications, Madras.
Williams, Stephen, *Tourism Geography*, Routledge, London, 1998.
Indira, *Tourism in Andhra Pradesh: Growth & Developments 1956-2007*, Research India Press, New Delhi, 2014.

Semester - VI

Paper VII (A): History and Culture of Telangana (From earliest times to 2014 CE)

Course outcomes:

1. To ascertain the foundation of Asafjhahi Dynasty.
2. To understand the consolidation of Asafjahi Rule in Hyderabad state.
3. To appreciate the the policies of Last Nijam of Hyderabad.
4. To an analyse the Peasant Armed Struggle in Telangana.

Unit-I: Sources – Pre-History of Telangana – Asmaka Janapada and the Culture of Ancient Telangana – Jainism and Buddhism – Brief Political Survey of Satavahanas – Ikshvakus, Vishnukundins – Medieval Telangana from Kakatiyas to Qutb Shahis – Popular Revolts – Sammakka-Sarakka, Sarvai Papanna – Society, Economy and Culture; Fairs, Festivals, Folk, Batukamma, Bonalu, Urs, Moharram, etc. Telangana Food, Festivals, Arts, Folksongs, Symbols, Musical Instruments, Composite Culture.

Unit-II: Foundation of Asaf Jahi Dynasty – A Brief Survey of The Political History of Asaf Jahis from 1724-1857 – Salarjungs Reforms and their Importance Mir Mahboob Ali Khan and Mir Osman Ali Khan – Modernization of Hyderabad under them – Growth of TRanspotation and Communication, Public Health, Industries and Osmania University – Public Health – Hospitals – Social, Cultural and Political Awakening in Telangana – Press, Journalism and Library Movements – Nizam Andhra Jana Sangham – Arya Samaj and Its Activities – Ittehadul Muslimin Party – Bhagya Reddy Varma and Dalit Movements.

Unit-III: Political Developments in Hyderabad State 1900 to 1942 – The Andhra Maha Sabha – Hyderabad State Congress – Mulki-Non-Mulki Issue (1930) - Vandemataram Movement – Comrades Association, Student and Workers Organisations and Movements - Communist Party

and Its Activities – The Role of Women in Hyderabad Freedom Movement.

Unit-IV: Anti-Nizam and Anti-Feudal Movements - Telangana Peasants Armed Struggle – Adivasis Revolt – Kumaram Bheem – Razakars and their Activities – Police Action - Formation of Popular Ministry under Burgula Rama Krishna Rao - Assertion of Mulki Identity and the City College Incident (1952) - Merger of Telangana and the Formation of Andhra Pradesh, (1956) .

Unit-V: Discrimination, Dissent and Protest - Violation of Gentlemen's Agreement - Agitation for Separate Telangana State: Formation of TPS – Role of Intellectuals, Students, Employees in 1969 Movement - Second Phase Movement for Separate Telangana – Formation of Various Associations – Telangana Aikya Vedika – Telangana Jana Sabha – Telangana Rashtra Samiti (2001) – Mass Mobilization – Sakala Janula Samme – Millennium March – Sagara Haram, Chalo Assembly – December 2009 Declaration and the Formation of Telangana State, June 2014.

Recommended Books:

Bhangya Bhukya, *The Subjugated Nomads*, Hyderabad, 2010.
Goutham Pingle, *The Fall and Rise of Telangana*, Hyderabad, 2014.
H. Rajendra Prasad, *Asaf Jahis*, Hyderabad, 2006.
I. Thirumali, *Against Dora and Lord*, New Delhi, 2008.
I. Thirumali, *Telangana – Andhra*, Delhi, 2010.
Kingshuk Nag, *Battle Ground Telangana*, Hyderabad, 2010.
Lalitha & Susie Tharu, *We were Making History*, Kali for Women, New Delhi.

Sarojini Regani, *Highlights of Freedom Struggle in Andhra Pradesh*.
Sarojini Regani, *Nizam-British Relations.*
Y. Gopal Reddy, *A Comprehensive History of Andhra Pradesh*, Hyderabad, 2008.
Telangana History and Culture, B.A. Third year (TM & EM) Telugu Academy, Hyderabad, 2019

Telugu:

Anveshi, *Manaku Teliyani Mana Charitra*.
G. Chakrapani, *Telangana Jaitrayatra*, Hyderabad, 2012.
Madapati Hanmanth Rao, *Telanganalo Andhrodyamam*, Hyderabad.
Mandumula Narsing Rao, *Yabai Sanvatsarala Hyderabad*, Hyderabad, 1977.
P. Sundaraiah, *Veera Telangana – Viplava Poratam*.
Raavi Narayana Reddy, *Viplava Telangana – Naa Gnapakaalu*.
Sarojini Regani, *Nizam-British Sambandhalu*.
Sunkireddy Narayana Reddy, *Telangana Charitra*, Hyderabad, 2014.
Surepalli Sujatha, *Irusuchakra Bandilo Telangana*.
V. Manikya Rao, *Hyderabad Swatantra Charitra*, 2000.

Semester - VI
Paper – VII B: Islamic History

Unit-I: The Scope of Islamic History – Geographical Conditions of Arabia – Pagan – Civilization and Islam – Political and Social Conditions before the Prophet at Mecca and Madina - Early Life of Prophet Muhammad – Meccan Period – Migration to Madina – The Holy Quran – The Battle of Badr –The Truce – Conquest of Mecca – Conditions of Arabia – Prophet Muhammad Social Reformer and Leader.

Unit-II: The Era of Pious Khalifas – Abu-Bakr-Umar – Further Expansion – Osman-Ali – Their

Achievements – The Struggle for Power between Syria and Al-Iraq and Hij'az – Administrative System under Khalifa - Causes for the Fall of Khalifas.

Unit-III: The Ummayad Khalifas – Mua-Wiyah-Yazid-I Battle of Karbala – Marwan-I-Abdul Malik and His Achievements - Al-Walid-I, Suleman – Ibn-Ul-Azi-Hisan – His Relations with Byzantine – Conquests in East and West Development of Society and Growth of Fine Arts – Marwan-II and the Fall of Ummayads – Administrative System under Ummayads – Society under Ummayads.

Unit-IV: The Advent of Abbasids – Al-Saffah and Al-Mnsur Al-Mahddi – Revolt in Khurasan – Byzantine Raid – Al-Hadi – His Achievements – Haroon – Al-Rasheed – His Political and Non-Political Achievements – Rise and Fall of Barmakids – Estimate of Haroon – Al-Rasheed's Character - Al-Amin – Civil War between – Al-Amin and Al-Mamun – Achievements of Al-Mamun – Later – Khalifas of Abbasid Dynasty – Al-Mutasm – War with the Byzantine Empire – Revolt of Tabaristan – The Buwaids – Azad-ud-Daula – The Seluqs – Malekshah - The Crusades – Causes – Course of Crusades – Imaduddin Zangi – Nuruddin – Mahmud – The Results of Crusades- The Abbasid State – Political and Military Systems – Judician Reforms – Education – Growth of the Fine Arts – Socio-Economic Conditions – Art and Architecture under Abbasids – Growth of Scientific Spirit - Fall of Abbasid Dynasty.

Unit-V: The Ummayads in Spain – Abdur-Rahman-Hisham-I – War with the Franks – Cultural Progress in Muslim Spain – The Fatimids of Egypt – Al-Mahdi – Al-Qaim – Al-Muizz Fall of Fatimids (1171 A.D.) – Administration and Society under Fatimids.

Recommended Books:

AmirAli, *History of Islamic People*.
P. Hitti, *History of Arabs.*
Moinuddin Nadvis, *Tarikh-i-Islam.*
Suleiman, *Rahamatullah in Alamin.*

Semester - IV

Indian National Movement (1857-1947 CE)

(GE - Generic Elective – (Open Stream)

Course outcomes:

1. To Cherish the values of Indian Freedom Movement.

2. To understand the significance of Independence of the country.

3.To emulate the sacrifices of Freedom fighters.

4. To understand various peaceful method of freedom Struggle.

Module-I: 1857 Revolt – Causes – Consequences - Factors for the Rise of Nationalism – English Education – Communications, News Papers – Economic Exploitation – Socio-Religious Reform Movements – Political and Administrative Unity - Emergence of Educated Intelligentsia.

Module-II: Formation of Indian National Congress – Its Aims & Objectives - Three Phases of India's Freedom Struggle – Moderates and Extremists – Their Ideology**:** Constitutional Type of Agitation – Vandemataram and Home Rule Agitations.

Module-III: Emergence of Gandhi – His Ideology, Non-Cooperation its importance and Civil Disobedience Dandi March – Role played by Women in National Movement - The Militant Nationalists – Their Ideology – Bhagath Singh – Rise of Left Ideology.

Module-IV: Origin of Peasant and Tribal Movements – Growth of Working Class Movement - Azad Hind Fauz – Subash Chandra Bose - Origin of Communalism – Factors for the Rise of Communalism in India - All India Muslim League and Hindu Mahasabha – Their Activities - results.

Module-V: Second World War – Quit India Movement – Course of the Quit India Movement – Second World War its Impact on Indian National Movement - Cripps Proposals; Cabinet Mission; Factors led to the Partition of Country and Emergence of Independent India August, 1947.

Recommended Books:

A.R. Desai, *Social Background of Indian Nationalism*, Popular Prakashan Pvt. Ltd., Mumbai, 2002.
Bipan Chandra, *Nationalism and Colonialism in Modern India*, Orient Longman, New Delhi, 1979.
Bipan Chandra, *India's Struggle for Independence*, Penguin Books, Kolkata, 2001
Sumit Sarkar, *Modern India (1885-1947)*, Macmillan India Ltd., Madras, 1995.
Sekhar Bandyopadhyay, *National Movement in India*, Oxford University Press, New York, 2009.
Sekhar Bandyopadhyay, *From Plassey to Partition*, Orient Longman Pvt. Ltd., New Delhi, 2004.
Amles Tripathi, Barun De and Bipin Chandra, *Freedom Struggle*, National Book Trust, 2007.
D. Rothermund, *The Phases of Indian Nationalism and Other Essays*, Nachiketa Publications, Bombay, 1970.
R. Suntherlingam, *Indian Nationalism – An Historical Analysis*, Vikas Publishing House, New Delhi, 1983.
D.N. Dhanagare, *Peasant Movements in India, 1920-1950*, Oxford University Press, New Delhi, 1991.
Ahmed, *Jinnah, Pakistan and Islamic Identity – The Search for Saladin*, Routledge, London, New York, 1997.
Mushirul Hasan (Ed.)., *India's Partition - Process, Strategy and Mobilization*, Oxford University Press, Delhi, 1993.
Kapil Kumar (Ed.)., *Congress and Classes: Nationalism Workers and Peasants*, Manohar Publishers, New Delhi, 1988.
D. Argov, *Moderates and Extremists in Indian Nationalist Movement, 1883-1920*, Asia Publishing House, London, 1967.
Indian History, B.A. Second year (TM & EM) Telugu Academy, Hyderabad, 2017.

Semester - VI
Ancient Civilizations
Optional

Unit-I: Beginnings of Ancient Civilizations – Features - Mesopotamian Civilization - Beginning and Expansion - Contacts with Other Civilizations - Nature of Polity – Socio-Economic and Religious Conditions - Evolution of Script - Art & Architecture.

Unit-II Egyptian Civilization -Origin and Spread – Polity - Society – Economy - Art and Architecture.

Unit-III Indus Valley Civilization – Salient Features – Decline - China - Nature and Extent of Civilization – Polity – Society - Economy – Religious Beliefs - Philosophy and Culture.

Unit-IV Greek Civilization - Nature of Polity and Society - Agrarian Economy - Trade and Urbanization - Distinctive Features of Greek Civilization – Philosophy – Education - Art and Architecture - Roman Civilization - Origin and Spread of Roman Empire – Features - Polity and Roman Republic – Slavery - Social Structure - Economic Organization - Religious System and Cultural Contribution – Decline.

Recommended Books:

A.L. Basham, *The Wonder that was India*, Rupa & Co., New Delhi, 2001.
Breasted, J.H., *Ancient Times: A History of the Early World*, Ginn, 1916, Vol. 2-5, 10
Bury, J., *History of Greece*.
Durant, W., *The History of Civilizations & Our Oriental Heritage*.
Gordon Childe, *What Happened in History*.
Joseph Needham, *Science and Civilization in China*.
Schneider, H., *The History of World Civilizations from Pre-Historic Times to the Middle Ages.*
B.V. Rao, *World History*.

GOVERNMENT DEGREE COLLEGE FOR WOMENS (AUTONOMOUS), BEGUMPET, HYDERABAD

DEPARTMENT OF HINDI

- **PROGRAMME OUT COME**
- **PROGRAMME SPECIFIC OUTCOME**
- **COURSE OUT COME**

WITH EFFECT FROM 2016 ONWARDS

FOR B.A, B.COM, B.S.C (LS&PS) AND B.B.A

FOR SEM-I, SEM-II, SEM-III & SEM IV

Department of Hindi
Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcome

PSO:1 Understanding the relation between society and literature and analyses the role played by Hindi literature in past and present.

PSO: 2 Understanding the strategy of converting worship into the movement of struggle for cultural freedom.

PSO:3 Developing skill of writing official letters in functional Hindi.

PSO: 4 Developing philosophy of life inspiring by the vision of eminent writers.

PSO:5 Identifying the nature and character of person through his actions.

PSO:6 Gaining socio cultural consciousness.

PSO:7 Exploring, analyzing and enriching the self knowledge.

POS: 8 Able to write and communicate effectively

POS : 9 Able to avail job opportunities in different fields as

- **Hindi officers,**

- **Translator in International Agency,**
- **Hindi assistant ,**
- **Hindi Manger,**
- **News reader**
- **Editor of New Paper**
- **Script writer in Radio in Television,**
- **Dialog writer, Reporter writer, Proof reader, Anchor, Singer, Writer,**
- **Teacher, Lecturer and Professor in Schools, Colleges and Universities ..etc.**

POS : 10 Develop research aptitude

.POS:11 Inculcate human values.

Department of Hindi
Course Outcome
Semester – I
Katha Sahitya Nibandh Evam Anya
Gadya Vidhayen

After successful completion of the course, students will be able to;

CO 1 : Understanding to built good character and develop a good personality for Youth has been explained by Dr. Babu Gulab Rai in"Uthsaa"and"Charithri Nirman"

CO 2 : Understanding the story "Bhabhi" written by Mahadevi Varma context of Widow problems and her struggle for independence in present society.

CO 3 : Understanding the vision of Premchand about middle class and Dalit problem in the story "Sadgathi"

CO 4: Understanding the change in content and style of expression in short stories indifferent periods through the stories of Premchand, Ramchandra Shukle, Gulab Rai, Dinakar, Mohan Rakesh, Hari Shankar Persayee, Usha Preyamvada, Mamtakaluiya.

CO5: Under standing the cultural consciousness of Ramdhari Singh Dinkariin "Bharathme Sanskriti sangam" .

CO 6 : Understanding the mythological as well as aesthetic aspect of nation in "Rastra ka Swaroop" through Vasudev Sharma.

CO 7 : Understanding the responsibilities and to fulfill their duties without support of parents through the story "Chota Jadhugar" by Jai Shankar Prasad.

CO 8 : Describing the dual nature of modern people in present era by Vinayak Rao in history "Hasuya Rovoo "and Bheeshm Sahani' story "Chef Ki Dawaat"

CO 9 : Understanding the struggle and failure of middle class people by Amar kanth in his story "Deputy Collectori"

CO 10 : Understanding the importance of environmental protection through "Paryavaran aur Pradushan" by Rajiv Garg.

CO 11 : Understanding the social consciousness of human values, Personality development, Duties towards society and responsibilities towards nation through their short stories of Pream Chand, Gulab Rai, Ramchandra Shukle, Mohan Rakesh, Usha Priyamvada, Susheela Tagbore

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GOVENRNMENT DEGREE COLLEGE FOR WOMENS (A), BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B+" GRADE BY NAAC
DEPARTMENT OF HINDI
SYLLABUS FOR
BA/B.Sc. /B.Com / BBA I YEAR SEMESTER - I

TEXT BOOK –ग□□य द□□पण &□□□ □□□□□ – □□□□□□ □□□□□□ (Telugu Academy-HYD)
ग□□य द□□पण (**PROSE),**□□□ □□□□□ (NON-DETAIL), □□□□□□□ (GRAMMER)

Unit – l GADYA DARPAN (PROSE)

1. Charitra Sangathan — Babu Gulaab Raai
2. Bazaar Darshan — Jainendra Kumar

UNIT – lI GADYA DARPAN (PROSE)

3. Bhaabhi — Mahadevi Varma
4. Bharat Mein Saanskriti Sangam — Ramdhari Singh Dinkar

UNIT – lll KATHA SINDU (NON-DETAIL)

1. Sadgati — Prem Chand
2. ChotaaJaadoogar — Jai Shanker Prasad
3. Prayashchitt — Bhagwati Charan Varma
4. Chief Ki Daawat — Bheeshma Saahani

UNIT IV (GRAMMAR)

a) Antonyms
b) Sandhi vichcched
c) Correction of sentence
d) Letter writing (Personal Letters, Official Letters, Letter of Complaints, Application for Appointment.)

Reference books recommended by the committee:
*** Saral Hindi Vyaakaran: Dakshin Bharat Hindi Prachaar Sabhaa.**
*** Hindi Vyaakaran : Shyam Chandra Kapoor.**
***PrathamikVyaakaraneveamRachanaa : Harish Chandra**

GOVENRNMENT DEGREE COLLEGE FOR WOMENS: BEGUMPET, HYDERABAD - 500016.

(AUTONOMOUS)

B.A, B.COM, B.SC & B.B.A 1st year

MODEL OF QUESTION PAPER – 2020 - 2021

SEMISER – I

Time : 2.1/2 Hrs.
Max. Marks :60

SECTION-A

I. निम्नलिखित शब्दों में से किन्ही पांच के विलोम शब्द लिखिए I
1x5=5M

1) बाहर 2) सुगंध 3) अंधेरा 4) सूर्यास्त 5) नया 6) कठिन 7) असली 8) वीर

II. निम्नलिखित शब्दों में से किन्ही पांच के संधि विच्छेद कीजिए I
1x5=5M

1) तपोवन 2) नीरस 3) भानुदय 4) सदाचार 5) विद्यालय 6) रामालय 7) गिरीश 8) निर्मल

III. निम्नलिखित वाक्यों में से पांच को शुद्ध कीजिए।
1x5=5M

1) वो मेरे को नहीं बुलाता
2) मैं जाते ही वह भी चले गया
3) महेश खाना पकाया
4) तुम तुम्हारे गांव जाओ
5) उन्होंने क्या बोली
6) ये माला कौन बनाया
7) सीता पुस्तक पढ़ी
8) सुरेश ने कॉफी बनाया

IV) हिंदी भाषा का महत्व बताते हुए अपने मित्र को पत्र लिखिए।
1x5=5M

अथव

किसी समाचार पत्र में संपादक पद के लिए स्वयं को प्रस्तुत करते हुए नौकरी के लिए आवेदन पत्र लिखिए।

SECTION-B

V) किसी एक की संदर्भ सहित व्याख्या कीजिए I
10x1=10M

1) मनुष्य का मूल्य उसके चरित्र में है चरित्र में ही उसके आत्माबल का प्रकाश होता है।

अथवा

2) बाजार में एक जादू है वह जादू आंख की राह काम करता है।

VI) किसी एक प्रश्न का उत्तर लिखिए।
10x1=10M

1) भाभी के जीवन की समस्याओं पर प्रकाश डालिए।

अथवा

2) राष्ट्र का स्वरूप निबंध का सारांश सरल भाषा में प्रस्तुत कीजिए।

VII) किसी एक कहानी का सारांश लिखिए।
10x1=10M

1) सद्गति 2) प्रायश्चित 3) चीफ की दावत

VIII) निम्नलिखित में से किसी दो पात्रों का चरित्र चित्रण कीजिए।
2x5=10M

1) पंडित घासीराम 2) दुखी 3) श्यामनाथ 4) रामू की बहू

Department of Hindi
Course Outcome
Semester – II
Katha Sahitya Nibandh Evam Anya
Gadya Vidhayen

1. In the story "Taayee" written by "Vishwanath Sharma" students come to the problems of a women who is suffering from Infertility problem , every women dreams to become mother, even though he doesn't become mother she shows all her love and affection towards the children of her sister in law, this story proves that every women's heart is filled with love.
2. In the lesson "Ande Ke Chilka" written by Mohan Rakesh students understands how people in the society acts as hypocrite towards religion and shows their false feelings towards religion and culture.
3. In the story "Rajneet Ka Batwara" written by "Harishanker Parsi" students comes to understand how own brothers from one house plays tricks in political parties by joining of each member separately in each parties for their selfishness and play game in politics and flutes the society.
4. In the lesson "Swamy Vivekananda" written by Rajiv Garg" students comes to know the life history of swami Vivekananda and his services towards society , and how youth can change the nation with their services.
5. In the lesson "Paryavaran Aur Hum" students understand how our nation the is facing the problem of pollution and what are the sources to over come out of these problems, and to keep our city clean and green city.
6. In the lesson "Deputy Collector" students comes to know the struggle and problems facing by low class people for job , after hardworking they are unable to get the job and facing financial problems in their life and their dream never come true.
7. In the lesson "Hasu va Roo" students understands how people show their selfishness and see their benefit in other loss that to in funeral rites and asks tip in that emotional places too.
8. "Waapasi" is the lesson in which students come to know the problems of retired man, who's family members ignores him and treat as outsider, after 30 years when he goes home after retirement, seeing that the old man returns back the same way from where he came as he doesn't find any love and affection in his own house and works in sugar factory.
9. "Seva " is he lesson where students understand how todays youth is negating their own parents and thinking that they are burden on them and this lesson teach them, that it is duty of their children to look out their parents in the old age.
10. "Siliya" is the story of a brave girl who fights with the society against their behavior towards low caste people and proves that they are equal in the society, and one day she receives self respect and position in the society.

GOVENRNMENT DEGREE COLLEGE FOR WOMENS (A), BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B+" GRADE BY NAAC
DEPARTMENT OF HINDI
SYLLABUS FOR
BA/B.Sc /B.Com / BBA I YEAR SEMESTER - II

TEXT BOOK –ग□□य द□□पण &□□□ □□□□□ – □□□□□□ □□□□□□ (Telugu Academy-HYD)
ग□□य द□□पण (**PROSE),**□□□ □□□□□ (NON-DETAIL), □□□□□□□ (GRAMMER)

Unit – l GADYA DARPAN (PROSE)

1. Taayee	Vishwanath Sharma
2. Ande keChhilka	Mohan Rakesh

UNIT – lI GADYA DARPAN (PROSE)

3. Rajneetika Bantwara	Harishankar Parsai
4. Swamy Vivekanand	VanshidharVidhyalankar
5. Paryaavaran aur hum	Rajeev Garg

UNIT – lll KATHA SINDU (NON-DETAIL)

1. Deputy kelektaree	Amarkanth
2.Hasoo yaroun	Vinayak Rao Vidyaalankar
3. Waapasi	Usha Priyamwadaa
4. Seva	MamataaKaaliyaa
5. Siliyaa	Susheelaa Takbhore

UNIT IV (GRAMMAR)

1. Usage of words into sentence
2. Translation of Hindi words into English
3. Translation of English words into Hindi
4. Re write of sentence as directed based on (Gender, number, Case voice, Tense)

Reference books recommended by the committee:
*** Saral Hindi Vyaakaran: Dakshin Bharat Hindi Prachaar Sabhaa.**
*** Hindi Vyaakaran : Shyam Chandra Kapoor.**
***PrathamikVyaakaraneveamRachanaa : Harish Chandra**

GOVENRNMENT DEGREE COLLEGE FOR WOMENS (A), BEGUMPET, HYD
DEPARTMENT OF HINDI
B.A, B.COM, B.SC & B.B.A 1st year
MODEL PAPER-2020 - 2021
SEMISER - II

Time : 2.1/2 Hrs. **Max. Marks :60**

SECTION-A

I. □□□□□□□□□□ □□□ □□ □□□□□□ □□□□ □□□□□□ □□ □□□□□ □□□ □□□□□□ □□□□□V I **5x1=5M**

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1.Minister 2. cashier 3. Order 4. Office 5. Passport 6. Agreement 7. Allowances 8. Life Insurance

III. □□□□□□□□□□ □□□ □□ □□□□□□ □□□□ □□□□□□ □□ □□□□□ □□ □□□□□□□□ □□□ □□□□□□ □□□□□ I **5x1=5M**

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IV. □□□□□□□ □□□□□□ □□□□□□□ □□ □□□□□ □□□□□ I **5x1=5M**

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Department of Hindi
Course Outcome
Paper III
Madhyakalin Hindi Kavya
Adhunik Hindi Kavya

After successful completion of the course, students will be able to;

CO 1 : Deliberate the classification and characteristics of mediva land modern Hindi kavya

CO 2: Understanding the role played by the poets of Bhakti culture in literature and society.

CO3: Describing the progressive nature of san Kabir and his writings.

CO 4 : Describing the krishnaleela poetry of Surdas by relating it with his philosophy of his life.

CO 5: Describing the Rama Bhakti poetry of Tulsidas along with the philosophy of Bhakticult.

CO6: Understanding the vision of Meera Bai in context of her Krishna Bhakti

CO 7: Describing the content and the skill of writings of Bihari in context of the socio cultural condition of his period.

CO 8: Describing the philosophy of life as well as poems of 'Chayawadi' writers Prasad,Nirala, Mahadevi, Maithali Sharan Gupt.

CO9: Describing the poems of Agey in context with his experience of life.

CO 10: Describing the nature loving as well as progressive spirit of Ayodhya Singh and along with hiss kill of writing 'Phool Aur Kanta ' in literature.

CO 11 : Describing Spirit of Nationalism as well as Duties and Responsibilities of youth to the nation and society by Maithali Sharana Gupt, Jaishankar Prasad in their poetry " Navyayuvako se and Bharath"

CO 12: Describing how to struggle and defeat the problems in life by Harivansh Rai Bachan in "Tu kuy bait gayapath par"

CO 13 : Describing the sweet memories of childhood through the poetry "Mera Naya Bachpan"by Subhadra Kumari Chowhan.

CO14: Understanding the characteristics of Hindi Aunvadh.

GOVENRNMENT DEGREE COLLEGE FOR WOMENS (A), BEGUMPET, HYDERABAD
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Unit l (POTERY)

1.Kabeer keDohe	Kabeer
2.Bal Leela	Surdas
3. Tulsi keDohe	Tulsi
4. Navayuvakaon se	MaithalisharanGupt

UNIT- II (POTERY)

5. Phool Aur Kaanta	Ayodhya Singh UpadhayayaHarioudh
6. Bharath	Jai Shanker Prasad
7.Jeevan Ka Adhikar	Sumitranandan Pant
8. Mera NayaaBachpaan	Subhadra Kumari Chawan

UNIT- III History of Hindi Literature

1. Aadi Kaal: Namakaran, Parissthitiyaan, Pravritiyaan **In semester exam question will be on Pravrittiyaan**
2. Bhakti Kaal :Namakaran, Paaristhitiyaan, Pravittiyaan **semester exam question will be on Pravrittiyaan**

UNIT- IV Brief study of the following authors and poets

1. Chand Bardai
2. Kabeer Das
3. Sur Das
4. Tulasi Das
5. Jai Shankar Prasad
6. Sumitranandan Pant
7. Bharatendu
8. Maithilsharan Gupt
9. Ramdhari Singh "Dinkar"

UNIT- V General essay on Social, Political and Literature subjects

1. Sahitya aur Samaaj
2. Vidyaarthi aur Rajneeti
3. Samaaj Mein nari ka sthan
4. AdhunikShikshaa aur Naari
5. Shikshaa par Bhoomandalikanarnkaaprabhaav
6. Jeewan meinswachchataa ka mahatva

HYDERABAD
RE-ACCREDITED WITH "B+" GRADE BY NAAC
DEPARTMENT OF HINDI
B.A, B.COM, B.SC & B.B.A 2ND year
MODEL PAPER-2020-2021 SEMESTER -III

Time: 2.1/2 Hrs. **Max. Marks :60**

SECTION-A

Marks=20

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SECTION-B

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Course Outcome

Semester IV- Paper IV
Hindi Sahitya KaItihas

After successful completion of the course, students will be able to;

CO 1 : Understanding the origin of Hindi language and its literature.

CO2: Identifying the dialects of Hindi language family.

CO 3: Analysing the development of Khariboli Hindi.

CO4: Understanding the concept to f history of literature.

CO5: Understanding the basis of the classification of Hindi literature.

CO 6: Understanding the importance and basis of the names given to each period of Hindi literature.

CO 7: Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, in context of socio-cultural and political condition of that period.

CO8: Identifying the eminent Hindi writer of each period.

CO 9: Understanding the reason of emergence of Four kaal (Adikal , Bhaktikaal, Riti Kaal, Adhnik Kaal) in Hindi literature.

CO 10: Understanding the literary trends of Adikal , Bhakti kaal, Riti Kaal ,Adhnik Kaal

CO 11: Understanding the history of development of Hindi drama, short stories and novels.

CO 12 : Understanding the discourse of women and dalits in Hindi literature.

CO13 : Understanding the importance of Translation studies.

CO14 : Understanding to write various forms of essays.

GOVENRNMENT DEGREE COLLEGE FOR WOMENS (A), BEGUMPET, HYDERABAD
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Unit – l KAVYA NIDHI (POTERY)

1. Meera KePadh	Meera Bai
2. Raheem KeDohe	Raheem
3. Bihaari KeDohe	Bihari
4. Bhagwan Buddhke Prati	Surya kant Tripathi Nirala

UNIT – ll) KAVYA NIDHI (POTERY

5. VeMuskaatePhool Nahi	Mahadevi Varma
6. Kalam Aur Talwaar	Ramdhari Dinkar
7. Tu Kuy Baith Gayaa Hai Path Par	Harivansh Rai Bachan
8. Anubhav Paripakva	Agyeya History fo Hindi Literature

UNIT – lll History of Hindi Literature

1. Riti Kaal :Namakaran, Paristthitiyaan, Pravrittiyaan
(For semester exam question will be on pravrittiyaan only)
2. Aadhunik Kaal
   a) BhartenduYug, Dwivedi Yug, Chayaawaad Yug, Pragatiwadi Yug.
   b) Hindi Gadya ka vikas, Hindikahaani, Upanyaas aur Naatak.

UNIT—lV Brief Study of the following authors

1. Meera Bai 2. Raheem 3. Bihaari 4. Mahaveer Prasad Dwivedi 5. Premchand
6. Surya Kanth TripatiNirala 7. Mahadevi Varma 8. Harivansh Rai Bachan
9. Agyeye

UNIT – V ESSAY ON GENERAL TPOICS

1. Vidyaarthi aur Anushaasan
2. Aaj Ki Shiksha Neeti
3. Bharat Mein Beroazgaari Ki Samasayaa
4. Paryaavaran Aur Hum
5. Bharat Mein BadhatiHuyi Jan Sankhyaa
6. Bharatiya Sanskriti

Comprehension Passage: FOR INTERNAL ASSESMENT

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DEPARTMENT OF HINDI

B.A, B.COM, B.SC & B.B.A 2nd year

MODEL PAPER-2020-2021 SEMISER -IV

Time : 2.1/2 Hrs. **Max. Marks :60**

SECTION-A **Marks:20**

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SECTION-B **Marks=40**

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GOVERNMENT DEGREE COLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERABAD

Re-Accredited with 'B^{+}' Grade by NAAC

BOARD OF STUDIES IN MASS COMMUNICATION AND JOURNALISM

For

UNDER GRADUATE PROGRAMME

B A MASS COMMUNICATION AND JOURNALISM

IN

CHOICE BASED CREDIT SYSTEM

(w.e.f. 2019-2020 Onwards)

B.A. MASS COMMUNICATION AND JOURNALISM

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program specific outcomes (PSOs)

- Students will be able to take up jobs in allied media industries and improve their Journalistic skills and learn to maintain the professional standards.
- The students will catering to the required skills related to report writing, editing, communications, news stories, advertising, RJs, News anchoring .

B.A. Mass Communication and Journalism Syllabus

Course	**Semester-I**	No. of Credits
DSC-101	Introduction to Communication and Journalism	5
	Semester-II	
DSC-201	Mass Media in India	5
	Semester-III	
SEC III	Forms of Journalistic Writing	2
DSC-301	Reporting and Editing for Print Media	5
	Semester-IV	
SEC-IV	Public Relations and Event Management	2

DSC-401	Broadcast and New Media Journalism	5
	Semester-V	
GE	TV News Anchoring	2
DSE-501	a)Media and Development Or b) Telugu Journalism	5
	Semester-VI	
GE	TV News presentation and Packaging	2
DSE-601	Media Literacy OR Advertising	5
	Project Freelance Journalism	4
Non-CGPA	NSS, NCC, Sports Summer Internship	6 4

SEMESTER- I

Course Outcomes (COs)

DSC-101 - Introduction to Communication and Journalism

CO1: The student will be able to understand the concepts of communication
CO2: The student will be familiarized with models of communication
CO3: The student will be familiarized with theories of communication
CO4: The student will be able to understand the basics of Journalism
CO5: The student will be explained about various kinds of journalism

Unit-I: Definition of communication, Communication and its role in society. Types of Communication-Verbal, Non-verbal, Intra-personal, Interpersonal, Group Communication, Mass Communication - Print, Radio, Television and film. Process of Mass Communication.

Unit-II: Models of Communication – Laswell – SMCR model, Shannon and Weaver – Osgood and Schramm. Dance Helical model of communication.

Unit-III: Theories of Communication – Effects theories – Agenda setting theory – Uses and gratifications theory, Normative media theories, propaganda. – publicity, Knowledge Gap Hypothesis, Information rich and Information poor.

Unit-IV: Journalism-Definition, scope and nature of Journalism; Role of journalism in a democracy/ society, creating awareness, building public opinion- Journalism and social change.

Unit-V: Kinds of Journalism: Print, Broadcast, On-line (Cyber) journalism, Sports, Science, Education, Development, Community, Cheque book and Yellow Journalism.

SEMESTER- II

Course Outcomes (COs)

DSC-201 - Mass Media in India

CO1: the student will be given historical understanding of media in India.
CO2: Explain the present status Radio in India.
CO3: Understand the Cinema and Films in Indian media.
CO4: Understand the Broadcast media
CO5: A brief history of New Media

Unit–I: Press

History of the Press in India -Colonial Period; Early Newspapers, Social Reform Movement, National Freedom Movement, Post Independence Era, Post Emergency Era. Changing Readership, Language Press. Recent Developments in Print Media.

Unit–II: Films-Evolution

Early films- Pioneers of Indian Cinema- Dadasaheb Phelka, Satyajit Ray, Shantaram, Bimal Roy and other film makers - parallel cinema- commercial cinema-regional cinema.

Unit – III: Radio

Early history of Radio in India. History of AIR: Evolution of AIR Programming. Radio in the Context of the State's Development Agenda. Patterns of State Control; the Demand for Autonomy, Formation of Prasar Bharati.FM: Radio Privatization. Community radio, satellite and web radio.

Unit – IV: Television

Development of television as a Medium of Mass Communication – Historical perspective of television in India – Satellite and Cable Television in India and Development of networks and regional Channels.

Unit – V: Origin, growth and Present status of New Media in India.

Brief history of internet, world wide web, social media, cyber crimes, cyber law, e-governance. Online media , podcast, digital divide.

Mass Media In India -Paper – II

MODEL QUESTION PAPER FOR SEMESTER EXAMINATION

Time: 2 ½ Hrs **Max. Marks: 60**

SECTION – A

a. Answer any 5 questions.
b. Each question carries 4 marks 5×4=20 marks

1. Social Reforms and colonial period
2. Parallel cinema
3. Merits of Radio
4. SITE project.
5. E-gov in India.
6. Emergency era
7. Internet
8. BengalGazette

SECTION – B

Answer the following questions. Each question carries 8 marks. 5X8=40 marks

1) a. Write about history of Press in India.(or)
   b. Explain the role of newspapers in post-independence era.
2. a. Trace the origin of Films in India.(or)
   b. Write a note on 100 years of Indian Film Industry.
3. a. Discuss the origin and development of radio broadcasting in India.(or)
   b. Discuss the various services of AIR.
4. a. Analyse the role of TV in bringing a social change. (or)
   b. Cite reasons for growth of regional channels.
5. a. Write a note on history of internet. (or)
   b. What do you mean by digital divide.

Booklist and references:

1. Larry L.Barker : Communication
2. **Mcquail, Denis : Mass Communication Theory**

3. Mcquail and Windahl : Communication Models
4. Keval J Kumar : Mass Communication in India
5. Vir Bala Agarwal : *Essentials of Practical Journalism*
6. K.M.Srivasthava : *Reporting and Editing*

SEMESTER- III

Course Outcomes (COs)

DSC-301 - Reporting and Editing for Print Media

CO1: The student will be able to identify different dimensions of the news.
CO2: Will understand types of reporting
CO3: will study organizational set up
CO4: Edit the news reports.
CO5: Explain the laws relating to media

Unit–I: Introduction to News - Definition – Nature – Scope of News – Sources of News – News Values – Qualities of a reporter. Fairness, balance, attribution. News gathering.

Unit-II: News writing – Elements of news story- Inverted pyramid- Leads- types. Reporting – Politics, Crime, Finance, Science, Health and environment, beat reporting.

Unit–III: Newspaper organization structure - Organisation of Editorial Department and the News Bureau.- Hierarchy, Different roles Path of a News Copy from event to the reader-

Unit–IV: The Editing Process: Editing – News Selection – Qualities of a sub-editor Integrating Copy – Rewriting; Types of Copy- Agency, Bureau, Wire, Mofussil – Functions of Headlines – Headline Writing – Excerpts – Blurbs – Highlights – Infographics. Photo Essay – Caption writing

Unit–V: Media Ethics and Laws: Freedom of speech and expression, Article 19 (1) (a) , reasonable restrictions, Media Laws and Ethics –-Defamation, Libel, slander, , Right to Information, Official secrets Act, Contempt of Court, Copyright Act of 1957, Fairness – Public Interest and privacy, Press Council of India (PCI) – Recommendations and status – Code of Ethics for Journalists.

SEMESTER- IV

Course Outcomes (COs)

DSC-401 - Broadcast and New Media Journalism

CO1: The student will be able to understand broadcast media.
CO2: Learn radio production.
CO3: Understand radio
CO4: Understand television journalism
CO5: Get involved in new media journalism.

DSC 401: Broadcast and New Media Journalism

Unit-I: Introduction to Broadcast Media: Broadcasting- Radio Transmission Process, Television Transmission Process, Impact and role of Broadcast media in society, Concept of Public Broadcasting, Contribution of AIR and Doordarshan to development, community Radio.

Unit-II: Introduction to Radio Journalism: Basic features of radio news .Sources of radio news, qualities and responsibilities of a radio reporter, criteria for selection of radio news .Radio news bulletin structure. News room set-up in a radio station. Different radio programme formats

Unit-III: Television Journalism: Basic characteristics and elements of television news, elements of a TV news bulletin .Writing style for television news. Duties, responsibilities and qualities of a TV reporter. Writing for Television, Television Programme formats, Television Script formats Interview: types and techniques of TV interview. New trends in television news reporting.

Unit IV: Television news based programmes, Television News Process from the event to the Screen. Hierarchy in television news channel. Ethical issues in television news.

Unit-V: New Media Journalism: Web-based newspapers, web-journalism. Unique features of Web Journalism, language, Internet newspaper editions, updates, Internet News Groups, e-mail, blogs. Internet as a tool for data gathering, Social Media Journalism, issues of veracity and credibility.

Booklist

1. VirBalaAgarwal : Essentials of Practical Journalism

2. K.M.Srivasthava : Reporting and Editing

3. TJS George : Editing

4. Maloney &Rubenstein : Writing for Media

5. .Burack : The Writers Handbook

6. A.G. Noorani : India’s Constitution & Politics

7. Durga Das Basu : Constitution of India

8. Durga Das Basu : Law of the Press

9. Millerson,Gerald : Effective TV Production

10. Hilliard : Writing for Television and Radio

11. Zeltl, Herbert : Television Production.

12. B.N.Ahuja : Audio-Visual Journalism

13. Welsch : Handbook for Scriptwriters

Module III – Reporting and Editing for Print Media

Paper – III/ Sem –III

MODEL QUESTION PAPER

Time: 2 ½ Hrs Total Marks: 60

SECTION – A

Answer any 5 questions.

Each question carries 4 marks. 5×4= 20marks

1. Qualities of a Reporter.

2. Sources of news

3. Inverted Pyramid style.

4. Crime reporting

5.News Hierarchy

6. Sub-editor

7. Translation

8. PCI

SECTION – B

II. Answer all questions with Internal Choice.

Each question carries 8 marks 5×8=40marks

1..a.Explain the Concept of News with suitable examples (or)

b. What are newsvalues?. Explain.

2. a. What are the different forms of news writing? Explain. (or)

b. Write about Investigative Journalism.

3. a. What is the role of News bureau in a news daily? (or)

b. Write the Editorial setup of a newspaper organisation.

4. a. What are the qualities of a Sub-editor? (or)

b. What are the functions of Headlines.

5. a. What do you mean by Defamation and Slander ? (or)

b. Write a note on Ethics in Media.

SKILL ENHANCEMENT COURSE

Title: Specialized Reporting

SEC - I Sem – III Duration: 2 Hours per week

Objectives: To define specialized reporting and identify the attributes of a typical specialized report • Distinguish between a specialist reporter and a generalist • identify and explain the special qualities of specialized reporter

MODULE-I:

Introduction to Science Communication: Science communication- characteristics ,Media use for science communication, important science publications for popular reading- Issues like GM crops, big dams and others. Media coverage of science- print- radio- television and new media. Promotional campaigns of science communication

MODULE -II:

Environment and Media: Role of media in covering environmental issues, Governmental and non-governmental organizations and environmental campaigns-Chipko, Appiko, Narmada Bachao Andolan and others. .Environmental policy initiatives: national and international and issues Global warming, Kyoto Protocol, Rio Earth Summit, Montreal Meet, Copenhagen, Paris declaration. Polavaram, Patancheru, Flourosis.

Title: ONLINE JOURNALISM

SEM - III - SEC - II Duration: 2 Hours per week

Objectives: To introduce and develop understanding of New Media, its evolution, theoretical underpinnings and growth and expansion • To enable students to write, produce and distribute for the digital platforms

MODULE-I: Evolution of ICT's - its impact on journalism – Information revolution and concept of information society. Digital divide. Evolution of new media and Social media. World Wide Web and internet; URL's, HTML, Hyperlinks, Search engines, emails. Blogs- nature and purpose of blogs; How to create and manage blogs.

MODULE-II: Origin and growth of e-newspapers - e journals. Writing for the screen vs writing for print; Principles and do's and don'ts. Internet and freedom of expression. Cyber laws; Privacy Policies. Evolution of online news portals – Scroll .in, Thewire.in, thehoot.org , The Guardian, Limitations and current trends of online journalism; Future of the online journalism.

Books list

1. Dynamic Web Publishing Unleashed – Shelley Powers, Techmadia 1998

2. Assessing the State of Web Journalism.-Nath, Shyam- Authors Press, New Delhi, 2002

3. Net, Media and the Mass Communication. - Chakravarthy, Jagdish. Authors press, NewDelhi, 2004

4. Mass Media and Information Revolution. - Bhargava, Gopal. - Isha Books, New Delhi,2004

5. The Communication Revolution.- Menon, Narayana. - National Book Trust.

6. Media in the Digital Age. - Pavlik J.V. - Columbia University Press.

Title: MEDIA LAW AND ETHICS

SEM - IV - SEC - III Duration: 2 Hours per week

Objectives: The course will helps students to understand on how to publish information without violating defamation and invasion of privacy and follow ethical and professional practices.

MODULE - I: Indian Constitution—Salient features, Fundamental Rights, Directive Principles, Freedom of Speech and Expression, its limitations. Press and Registration of Books Act, Working Journalists Act, Contempt of Court Act, contempt of court Defamation. Official Secrets Act, Right to privacy Right to Information Act, 2005. Cyber Laws, Intellectual Property Rights, Copyright Act.

MODULE – II :Introduction to Media Ethics. Yellow Journalism, codes relating to Communal writing, Right to reply, Press Council of India Act—structure and codes, Role, functioning and impact of Press Council, Media and Human Rights and Civil Rights, SHRC, NHRC.

Booklist

1. A.G. Noorani : India’s Constitution & Politics

2. Durga Das Basu : Constitution of India

3. Durga Das Basu : Law of the Press

4. B.N. Ahuja : History of Press and Press Laws

5. Press Institute of India : Press and the Law

6. Sita Bhatia : Freedom of the Press

7. PCI Reviews and Annual Reports.

Title: Forms of Journalistic Writing

SEM - IV - SEC - IV Duration: 2 Hours per week

Objectives: To impart journalistic skills to the students. and enable and inspire the students to write for newspapers. To introduce different forms of writing.

Unit 1

News – Soft and Hard news; News Writing – Spot news/Live news, in depth, investigative, interpretative. Structure/Format – Inverted, Hour glass, Stacked; Elements – Objectivity, Fairness, Balance, Attribution, Quotations, partial quotations, full quotations, direct and indirect quotes; basics of writing for news websites, portals.

Unit 2

Subjectivity in writing – features-types (interviews, profiles, historical features, travelogues, how to do features, middles), articles, edit page articles, editorials, reviews, criticism, columns, blogs.

GENERAL ELECTIVE - I

Title: REPORTING AND SCRIPT WRITING

GE – I SEM – V Duration: 2 Hours per week

Objectives: To develop understanding of Television, its Newsroom, Organizational structure and Reporting process. Also to enable students to write news scripts for TV MODULE- I: TV Journalism - Understanding the medium. Advantages of television journalism . The process of television journalism. Live news reports. Reporting Programme format of reporting- Suggestions for style and treatment - The story - the process - Sources - Research - News values and principles - Journalistic beats.

MODULE – II Writing for Visuals: Principles of writing for visuals - steps for producing the perfect news story - Visual language - Script format for television scripts – Reporting – Documentaries – Interviews. Piece to Camera - Principles of delivering an effective PTC.

Programme Production - Packaging for a channel - Significance and elements of packaging for news channels.

GENERAL ELECTIVE – II

SYLLABUS (2020-2021)

Title: TV NEWS ANCHORING

GE – II SEM – VI Duration: 2 Hours per week

Objectives: The course offers basics of news reading, presentation and voice over.

MODULE-I: Basics of Television News Anchor Basic Principles of Television News Presentation, The TV News Anchor- Qualities, roles, skills and responsibilities, professional ethics, dress sense, performance, dealing with contingencies. Camera facing techniques- Grooming for camera,on camera movement, holding props, scripts, peripheral vision, cue cards and makeup etc. Tele-prompter and its functioning, Voice analysis-pitch, volume, pronunciation and vitality.

MODULE -II Programming techniques, Basic Difference between News and Non-News Programe, Non- news show anchoring, Anchoring different Journalistic genres- documentary, Interview-Based Shows, Interactive and Panel Discussion Reporting techniques Piece to camera (PTC), Vox pop, Live Reporting-working with an OB Unit, Essentials of Field Reporting and Basic of giving a Live Phone-in.

Booklist

1. P.C. Chatterji :Broadcasting in India

2. Herbert Zettle: Television Production

3. Campbell, Meath& Johnson: A Guide to Radio, TV Writing

4. Pane Sureyat: Broadcast News Writing

5. S.P.Jain: The Art of Broadcasting

6. H.R.Luthra:Indian Broadcasting

7.The Abc of News Anchoring - Richa Jain

8. Anchoring America - Jeff Alan, James M Lane

GOVERNMENT DEGREE COLLEGE FOR WOMEN

AUTONOMOUS

BEGUMPET, HYDERABAD

DEPARTMENT OF MATHEMATICS

B.Sc. COURSE STRUCTURE, SYLLABUS, POs, PSOs & COs

CHOICE BASED CREDIT SYSTEM

2020-21

B.Sc., MATHEMATICS, COURSE STRUCTURE,2020-21

CHOICE BASED CREDIT SYSTEM

PAPER	SEMESTER	SUBJECT	HOURS PER WEEK	THEORY HOURS PER WEEK	PRACTICALS FOR SEMV,VI/ TUTORIALS FOR SEM I,II,III,IV HOURS PER WEEK	MAX. MARKS	CRIDITS
DSC-I	I	DIFFERENTIAL AND INTEGRAL CALCULUS (w.e.f.2019-20)	6	5	1	100	5
DSC-II	II	DIFFERENTIAL EQUATIONS (w.e.f.2019-20)	6	5	1	100	5
DSC-III	III	REAL ANALYSIS (w.e.f.2020-21)	6	5	1	100	5
DSC-IV	IV	ALGEBRA (w.e.f.2020-21)	6	5	1	100	5
DSC-V	V	LINEAR ALGEBRA (Last batch, to be revised in 2021-22)	5	5	2	100	5
DSE-V	V	INTEGRAL CALCULUS (Last batch, to be revised in 2021-22)	5	5	2	100	5
DSC-VI	VI	NUMERICAL ANALYSIS (Last batch, to be revised in 2021-22)	5	5	2	100	5
DSE-VI	VI	VECTOR CALCULUS (Last batch, to be revised in 2021-22)	5	5	2	100	5
SEC-I	III	THEORY OF EQUATIONS	2	2	0	50	2
SEC-II	IV	NUMBER THEORY	2	2	0	50	2
SEC-III	V	MATHEMATICAL MODELLING	2	2	0	50	2
SEC-IV	VI	GRAPH THEORY	2	2	0	50	2
GE	V	QUANTITATIVE APTITUDE	2	2	0	50	2
GE	VI	VERBAL AND LOGICAL REASONING	2	2	0	50	2

PROGRAMME OUTCOMES (POs)

PO1. Domain Expertise:

- **Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.**

PO2. Modern equipment Usage:

- **Equip the students with modern technological skills, so that they are able to use software applications in their careers.**

PO3. Computing Skills and Ethics:

- **Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.**

PO4. Complex Problem Investigation & Solving

- **Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action**

PO5. Perform effectively as Individuals and in Teams

- **Be able to contribute at individual level and as team member and prioritize institutional interest over individual**

PO6. Efficient Communication & Life skills

- **Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely**

PO7. Environmental Sustainability

- **Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.**

PO8. Societal contribution

- **Develop the pride in volunteering to address societal issues viz: calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.**

PO9. Effective Project Management

- **Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.**

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Explain the importance of mathematics and its techniques to solve real life problems and provide the limitations of such techniques and validity of the results.

PSO2: Propose new, mathematical questions and suggest statistical analysis with appropriate software packages and /or computer programming to find solutions to these questions.

PSO3: Continue to acquire mathematical knowledge and skills appropriate to professional activities and demonstrate the highest standards of ethical issues in mathematics.

PSO4: Use computer calculations as a tool to carry out scientific investigations and develop new variants of the acquired methods if required by the problem at hand.

PSO5: Get PG seat in a good university, further, after completion of PG, crack lectureship and fellowship exams approved by UGC like CSIR-NET and SET with an in-depth conceptual foundation at UG level.

PSO6: Apply knowledge of Mathematics in all the fields of learning including higher research and its extensions.

2020-21

COURSE OBJECTIVE, CORSE OUTCOMES AND SYLLABUS

SEMESTER-I

DIFFERENTIAL AND INTEGRAL CALCULUS

COURSE OBJECTIVE:

The main aim of this course is to introduce the students to the concepts of differential and integral calculus to train to apply their skills in solving some of the problems of calculus in higher education and research.

COURSE OUTCOMES (COs):

After completion of this course, the student will be able to

CO1: Gain the understanding of partial differentiation.

CO2: Deliberate in depth functions of two variables.

CO3: Verify whether a given function is continuous or not at a given point by an understanding of the neighbourhood of a point in (a,b).

CO4: Find the limit of a function of two variables.

CO5: Apply and solve homogeneous functions.

CO 6: Differentiate composite functions and implicit functions.

CO7: Compute radius of curvature and length of arc as a function.

CO 8: Determine the area of the surface of the frustum of a cone.

UNIT- I

Partial Differentiation: Introduction - Functions of two variables - Neighborhood of a point (a, b) - Continuity of a Function of two variables, Continuity at a point - Limit of a Function of two variables - Partial Derivatives - Geometrical representation of a Function of two Variables - Homogeneous Functions.

UNIT- II

Theorem on Total Differentials - Composite Functions - Differentiation of Composite Functions - Implicit Functions - Equality of f_{XY} (a, b) and f_{yz}(a, b) - Taylor's theorem for a function of two Variables - Maxima and Minima of functions of two variables – Lagrange's Method of undetermined multipliers.

UNIT- III

Curvature and Evolutes: Introduction - Definition of Curvature - Radius of Curvature - Length of Arc as a Function, Derivative of arc - Radius of Curvature - Cartesian

Equations - Newtonian Method - Centre of Curvature - Chord of Curvature. Evolutes: Evolutes and Involutes - Properties of the evolute. Envelopes: One Parameter Family of Curves - Consider the family of straight lines - Definition - Determination of Envelope.

UNIT- IV

Lengths of Plane Curves: Introduction - Expression for the lengths of curves y = f (x) - Expressions for the length of arcs x = f (y); x = f (t), y = ϕ(t); r = f(θ) Volumes and Surfaces of Revolution: Introduction - Expression for the volume obtained by revolving about either axis - Expression for the volume obtained by revolving about any line - Area of the surface of the frustum of a cone - Expression for the surface of revolution – Pappu's Theorems - Surface of revolution.

PRESCRIBED TEXTBOOK :

- **Shanti Narayan, P.K. Mittal Differential Calculus, S.CHAND, NEW DELHI 5**
- **Shanti Narayan Integral Calculus, S.CHAND, NEW DELHI**

REFERENCE BOOKS:

- **William Anthony Granville, Percey F Smith and William Raymond Longley; Elements of the differential and integral calculus**
- **Joseph Edwards , Differential calculus for beginners**
- **Smith and Minton, Calculus**
- **Elis Pine, How to Enjoy Calculus**
- **Hari Kishan, Differential Calculus**

SEMESTER-II

DIFFERENTIAL EQUATIONS

COURSE OBJECTIVE:

The main aim of this course is to introduce the students to the techniques of solving differential equations and to train to apply their skills in solving some of the problems of engineering and science.

COURSE OUTCOMES (COs):

After completion of this course, the student will be able to

CO1: Gain the complete understanding of linear differential equations of first order and first degree.

CO2: Deliberate in depth differential equations of first order and first degree.

CO3: Verify whether a given differential equation is exact or not.

CO4: Identify the appropriate integrating factors to make a non-exact differentiable equation to exact.

CO5: Apply and solve first order differential equations

CO6: Equipped with the various tools to solve few types differential equations that arise in several branches of science.

UNIT- I

Differential Equations of first order and first degree: Introduction - Equations in which variables are separable - Homogeneous Differential Equations - Differential Equations Reducible to Homogeneous Form - Linear Differential Equations - Differential Equations Reducible to Linear Form - Exact differential equations - Integrating Factors - Change in variables - Total Differential Equations - Simultaneous Total Differential Equations - Equations of the form $dx/P = dy/Q = dz/R$.

UNIT- II

Differential Equations first order but not of first degree: Equations Solvable for p - Equations Solvable for y - Equations Solvable for x - Equations that do not contain x (or y)- Equations Homogeneous in x and y - Equations of the First Degree in x and y - Clairaut's equation. Applications of First Order Differential Equations : Growth and Decay - Dynamics of Tumour Growth - Radioactivity and Carbon Dating - Compound Interest - Orthogonal Trajectories.

UNIT- III

Higher order Linear Differential Equations: Solution of homogeneouslinear differential equations with constant coefficients - Solution of non-homogeneous differential equations P (D)y = Q(x) with constant coefficients by means of polynomial operators when Q(x) = be ^{ax}, b sin ax, b cos ax, bx^k, V e ^{ax} - Method of undetermined coefficients.

UNIT- IV

Method of variation of parameters - Linear differential equations with non constant coefficients - The Cauchy - Euler Equation - Legendre's Linear Equations - Miscellaneous Differential Equations. Partial Differential Equations: Formation and solution- Equations easily integrable - Linear equations of first order.

PRESCRIBED TEXT BOOK :

- Zafar Ahsan, Differential Equations and Their Applications

REFERENCE BOOKS:

. Frank Ayres Jr, Theory and Problems of Differential Equations.

- Ford, L.R, Differential Equations
- Daniel Murray, Differential Equations.
- S. Balachandra Rao, Differential Equations with Applications and Programs.

• **Stuart P Hastings, J Bryce McLead; Classical Methods in Ordinary Differential Equations.**

SEMESTER III
REAL ANALYSIS

COURSE OBJECTIVE:

The course is aimed at exposing the students to the foundations of analysis which will be useful in understanding various physical phenomena.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Appreciate beauty and applicability of the course.

CO 2: Deliberate in details real number systems

CO 3: Give examples of sequences and series.

CO 4: Understand the underlying vital basic concepts of real analysis such as epsilon-delta definition of limit of a sequence and convergence of a sequence.

CO 4: Determine the continuity and uniform continuity of a function at a point.

CO 5: Compute limits of given functions

CO 6: Explain the properties of continuous functions

CO 7: Prove and apply the mean value theorems

CO 8: Elaborate the geometrical representations of mean value theorems

CO 9: Apply Taylor's and Maclaurian's theorems

CO 10: Differentiate the Darboux and Riemann integrals

CO 11: Gain the significance of the Fundamental theorem of Integral calculus in integration.

UNIT- I

Sequences: Limits of Sequences- A Discussion about Proofs-Limit Theorems for Sequences. Monotone Sequences and Cauchy Sequences –Subsequences- Lim sup and Lim inf-Series-Alternating Series and Integral Tests .

UNIT- II

Continuity: Continuous Functions -Properties of Continuous Functions -Uniform Continuity - Limits of Functions

UNIT- III

Differentiation: Basic Properties of the Derivative - The Mean Value Theorem - L'Hospital Rule - Taylor's Theorem and Maclaurin's theorem.

UNIT- IV

Integration : The Riemann Integral - Properties of Riemann Integral-Fundamental Theorem of Calculus.

PRESCRIBED TEXTBOOK :

• Kenneth A Ross ,Elementary Analysis-The Theory of Calculus.

REFERENCE BOOKS:

• S.C. Malik and Savita Arora, Mathematical Analysis, Second Edition, Wiley Eastern Limited, New Age International (P) Limited, New Delhi, 1994.

• William F. Trench, Introduction to Real Analysis

• Lee Larson , Introduction to Real Analysis I

• Shanti Narayan and Mittal, Mathematical Analysis

• Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner; Elementary Real analysis

• Sudhir R., Ghorpade, Balmohan V., Limaye; A Course in Calculus and Real Analysis 9 1.4

SEMESTER III

SEC-II

THEORY OF EQUATIONS

COURSE OBJECTIVE:

Students learn the relation between roots and coefficients of a polynomial equation, Descartes's rule of signs in finding the number of positive and negative roots if any of a polynomial equation besides some other concepts of Numerical Analysis.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Appreciate beauty and applicability of the course.

CO 2: Deliberate in details of theory of equations.

CO 3: Compute maxima and minima values of polynomials.

CO 4: Determine the number of roots of an equation.

CO 5: Use DesCartes Rule of signs for positive and negative roots.

CO 6: Establish relation between the roots and coefficients of a given polynomial.

CO 7: Evaluate the cube roots units.

CO 8: Give examples of roots of symmetric functions.

UNIT- I

Graphic representation of a polynomial-Maxima and minima values of polynomials-Theorems relating to the real roots of equations-Existence of a root in the general equation -Imaginary rootsTheorem determining the number of roots of an equation-Equal roots-Imaginary roots enter equations in pairs-Descartes' rule of signs for positive roots- Descartes' rule of signs for negative roots.

UNIT- II

Relations between the roots and coefficients-Theorem-Applications of the theorem-Depression of an equation when a relation exists between two of its roots-The cube roots of unity Symmetric functions of the roots-examples.

PRESCRIBED TEXT BOOK :

- **W.S. Burnside and A.W. Panton,The Theory of Equations**

REFERENCE BOOKS:

- **C. C. Mac Duffee, Theory of Equations**
- **Hall and Knight , Higher Algebra 25 1.10**

SEMESTER-IV
ALGEBRA

COURSE OBJECTIVE:

The course is aimed at exposing the students to learn some basic algebraic structures like groups, rings etc.

COURSE OUTCOMES:

On successful completion of the course students will be able to

CO1: Appreciate its interdisciplinary nature.

CO 2: Recognize algebraic structures that arise in matrix algebra, linear algebra.

CO 3: Apply the skills learnt in understanding various such subjects.

CO 4: Give examples of various groups and subgroups under various binary operations.

CO 5: Identify generators of cyclic groups.

CO 6: Operate permutation groups.

CO 7: Understand and apply concepts of cosets in permutation grous and in other topics of algebra.

CO 8: Prove and apply Lagrange's theorem.

CO 9: Identify and operate on normal subgroups and factor groups.

CO 10: Use homomorphism, isomorphism and automorphism in proving theorems and solving problems.

CO 11: Establish properties of ideals, concepts of principal, prime and maximal ideals.

CO 12: Determine factor rings and ring homomorphism.

UNIT- I

Groups: Definition and Examples of Groups- Elementary Properties of Groups- Finite Groups - Subgroups -Terminology and Notation -Subgroup Tests - Examples of Subgroups. Cyclic Groups: Properties of Cyclic Groups - Classification of Subgroups Cyclic Groups.

UNIT- II

Permutation Groups: Definition and Notation -Cycle Notation-Properties of Permutations -A Check Digit Scheme Based on D5. Isomorphisms ; Motivation-Definition and Examples -Cayley's Theorem Properties of Isomorphisms - Automorphisms-Cosets and Lagrange's Theorem Properties of Cosets 138 - Lagrange's Theorem and Consequences-An Application of Cosets to Permutation Groups -The Rotation Group of a Cube and a Soccer Ball.

UNIT- III

Normal Subgroups and Factor Groups: Normal Subgroups-FactorGroups-Applications of Factor Groups -Group Homomorphisms - Definition and Examples - Properties of Homomorphisms -The First Isomorphism Theorem. Introduction to Rings: Motivation and Definition -Examples of Rings -Properties of Rings - Subrings. Integral Domains: Definition and Examples - Fields –Characteristics of a Ring.

UNIT- IV

Ideals and Factor Rings: Ideals -Factor Rings -Prime Ideals and Maximal Ideals. Ring Homomorphisms: Definition and Examples-Properties of Ring- Homomorphisms.

PRESCRIBED TEXTBOOK :

- **Joseph A Gallian, Contemporary Abstract algebra (9th edition)**

REFERENCE BOOKS:

- **Herstein, I.N, Topics in Algebra**
- **Bhattacharya, P.B Jain, S.K.; and Nagpaul, S.R,Basic Abstract Algebra**
- **Fraleigh, J.B, A First Course in Abstract Algebra.**
- **Robert B. Ash, Basic Abstract Algebra**
- **I Martin Isaacs, Finite Group Theory**
- **Joseph J Rotman, Advanced Modern Algebra**

SEMESTER IV

SEC-IV

NUMBER THEORY

COURSE OBJECTIVE:

Students will be exposed to some of the jewels like Fermat's theorem, Euler's theorem in number theory.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Appreciate beauty and applicability of the course.

CO 2: Deliberate in details of Number theory.

CO 3: Prove the Goldbach conjecture.

CO 4: Explain the properties of congruences.

CO 5: Write binary and decimal representations of integers.

CO 6: Establish the number theoretic functions.

CO 7: Apply Euler's generalization of Fermat's theorem.

CO 8: Use Euler's Phi function

CO 9: Give examples of Sum and Number of Divisors.

UNIT- I

The Goldbach conjecture - Basic properties of congruences- Binary and Decimal Representation of integers - Number Theoretic Functions; The Sum and Number of divisors- The Mobius Inversion Formula- The Greatest integer function.

UNIT- II

Euler's generalization of Fermat's Theorem: Euler's Phi function- Euler's theorem SomeProperties of the Euler's Phi function.

PRESCRIBED TEXTBOOK :

- **David M Burton,Elementary Number Theory (7e)**

REFERENCE BOOKS:

- **Thomas Koshy, Elementary Number Theory and its Applications**
- **Kenneth H Rosen, Elementary Number Theory 35 1.12**

SEMESTER-V

LINEAR ALGEBRA

COURSE OBJECTIVE:

The students are exposed to various concepts like vector spaces , bases , dimension, eigen values etc.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Appreciate beauty and applicability of the course.

CO 2: Deliberate in detailed vector spaces.

CO 3: Give examples of vector spaces and subspaces.

CO 4: Understand the underlying vital basic concepts of vector space such as pivot columns and pivot positions

CO 4: Determine the dimensions of Null space, Row space and Column space of a given matrix.

CO 5: Compute Ranks of Null space, Row space and Column space of a given matrix.

CO 6: Evaluate the eigenvalues and eigenvectors.

CO 7: Prove and apply the concepts of eigenvalues and eigenvectors in other areas of mathematics.

CO 8: Establish the complex eigenvalues and eigenvectors.

CO 9: Apply Linear algebra concepts to differential equations.

CO 10: Write the characteristic equation for a given matrix.

CO 11: Differentiate between Linear dependence and linear independence of sets.

UNIT- I

Vector Spaces: Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems -The Dimension of a Vector Space.

UNIT- II

Rank-Change of Basis - Eigenvalues and Eigenvectors - The Characteristic Equation.

UNIT- III

Diagonalization -Eigenvectors and Linear Transformations-Complex Eigenvalues-Applications To Differential Equations.

UNIT-IV

Orthogonality and Least Squares : Inner Product, Length, and Orthogonality - Orthogonal Sets -Orthogonal Projections - The Gram-Schmidt Process.

PRESCRIBED TEXTBOOK :

• David C Lay,Linear Algebra and its Applications

REFERENCE BOOKS:

• S Lang, Introduction to Linear Algebra

• Gilbert Strang , Linear Algebra and its Applications • Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; Linear Algebra

• Kuldeep Singh; Linear Algebra

• Sheldon Axler; Linear Algebra Done Right

SEMESTER V

INTEGRAL CALCULUS

COURSE OBJECTIVE:

Techniques of multiple integrals will be taught.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Know about its applications in finding areas and volumes of some solids.

CO 2: Evaluate double integrals integrals.

CO 3: Compute double integrals over a rectangle.

CO 4: Apply double integrals over general regions in a plane.

CO 5: Change the order of integration.

CO 6: Solve triple integrals.

CO 7: Change variables in triple integrals.

UNIT- I

Areas and Volumes: Double Integrals-Double Integrals over a Rectangle-Double Integrals over General Regions in the Plane-Changing the order of Integration.

UNIT- II

Triple Integrals: The Integrals over a Box- Elementary Regions in Space-Triple Integrals in General

UNIT- III

Change of Variables: Coordinate Transformations-Change of Variables in Triple Integrals.

PRESCRIBED TEXTBOOK :

- **Susan Jane Colley,Vector Calculus(4e)**

REFERENCE BOOKS:

- **Smith and Minton, Calculus**
- **Shanti Narayan and Mittal , Integral calculus**
- **Ulrich L. Rohde , G. C. Jain , Ajay K. Poddar and A. K. Ghosh; Introduction to Integral Calculus.**

SEMESTER V

SEC

MATHEMATICAL MODELLING

COURSE OBJECTIVE:

This topic aims to provide the student with some basic modelling skills that will have application to a wide variety of problems.

COURSE OUTCOMES:

The focus is on those mathematical techniques that are applicable to models involving differential equations, and describe rates of change. Student realizes some beautiful

problems can be modeIled by using differential equations. The students also learn how to use the mathematical technique in solving differential equations.

After the completion of the course students will be in a position to

CO 1: Appreciate beauty and applicability of the course.

CO 2: Learn how to use the mathematical technique in solving differential equations.

CO 3: The focus is on those mathematical techniques that are applicable to models involving differential equations, and describe rates of change.

CO 4: Realizes some beautiful problems can be modeled by using differential equations.

CO 5: Formulate Heat and Mass Transport Models.

CO 6: Understand mathematical modelling of exponential decay and radioactivity.

CO 7: Apply models of single populations.

CO 8: Use Boundary value problems.

CO 9: Write heat conduction equation.

UNIT-I

Linear Models -Non Linear Models - Modeling with Systems of First order Differential Equations.

UNIT- II

Linear Models: Initial- Value Problems- Spring/ Mass Systems;Undamped Motion Spring/Mass Systems;Free Damped Motion- Spring/ Mass Systems; Driven Motion-Series Circuit Analogue- Linear Models: Boundary Value Problems.

PRESCRIBED TEXTBOOK :

- **1. B.Barnes and G.R.Fulford, Mathematical Modelling with Case Studies 3rd Edition, 2009, CRC press**

REFERENCE BOOKS:

- **1. Shepley L. Ross, "Differential Equations".**
- **2. I. Sneddon , Elements of Partial Differential Equations**
- **3.Zafar Ahsan, "Differential Equations and their Applications"**

SEMESTER VI

NUMERICAL ANALYSIS

COURSE OBJECTIVE:

Students will be made to understand some methods of numerical analysis.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Students realize the importance of the subject in solving some problems of algebra and calculus.

CO 2: Appreciate beauty and applicability of the course.

CO 3: Deliberate in details of numerical analysis.

CO 4: Find errors in numerical calculations.

CO 5: Solve equations in one variable .

CO 6: Apply bisection, iteration, false position, Newton's and Muller's methods.

CO 7: Use Newton's formula for interpolation.

CO 8: Apply Gauss's, Stirling's, Bessel's , Lagrange's and Newton's formulae for forward, backward and central interpolation.

CO 9: Learn numerical differentiation and numerical integration.

UNIT- I

Errors in Numerical Calculations - Solutions of Equations in One Variable: The Bisection Method - The Iteration Method - The Method of False Position-Newton's Method - Muller's Method - solution of Systems of Nonlinear Equations.

UNIT- II

Interpolation and Polynomial Approximation: Interpolation-Finite Differences-Differences of Polynomials - Newton's formula for Interpolation - Gauss's central differences formulae - Stirling's and Bessel's formula - Lagrange's Interpolation Polynomial - Divided Differences - Newton's General Interpolation formula - Inverse Interpolation.

UNIT- III

Curve Fitting: Least Square Curve Fitting: Fitting a Straight Line-Nonlinear Curve Fitting. Numerical Differentiation and Integration: Numerical Differentiation –

Numerical Integration: Trapezoidal Rule-Simpson's 1/3rd-Rule and Simpson's 3/8th-Rule - Boole's and Weddle's Rule - Newton's Cotes Integration Formulae.

UNIT- IV

Numerical Solutions of Ordinary Differential Equations: Taylor's Series Method - Picard's Method - Euler's Methods - Runge Kutta Methods.

PRESCRIBED TEXT BOOK :

- **S.S.Sastry,Introductory Methods of Numerical Analysis, PHI**

REFERENCE BOOKS:

- **Richard L. Burden and J. Douglas Faires,Numerical Analysis (9e)**
- **M K Jain, S R K Iyengar and R K Jain, Numerical Methods for Scientific and Engineering computation**
- **B.Bradie , A Friendly introduction to Numerical Analysis 1.7**

SEMESTER VI

VECTOR CALCULUS

COURSE OBJECTIVE:

Concepts like gradient, divergence, curl and their physical relevance will be taught.

COURSE OUTCOMES:

Students realize the way vector calculus is used to address some of the problems of physics.

After the completion of the course students will be in a position to

CO 1: Students realize the way vector calculus is used to address some of the problems of physics.

CO 2: Appreciate beauty and applicability of the course.

CO 3: Establish the work done against a force.

CO 4: Evaluate line integrals.

CO 5: Write binary and decimal representations of integers.

CO 6: Determine conservative vector fields.

CO 7: Find surface integrals.

CO 8: Compute volume integrals.

CO 9: Understand the concepts of gradient, divergence, curl and establish relations among them.

CO 10: Apply Taylor's series .

CO 11: Use gradient of a scalar field.

CO 12: Determine conservative fields and potentials.

UNIT- I

Line Integrals: Introductory Example - Work done against a Force-Evaluation of Line Integrals Conservative Vector Fields. Surface Integrals: Introductory Example : Flow Through a Pipe. Evaluation of Surface Integrals.

UNIT- II

Volume Integrals: Evaluation of Volume integrals Gradient, Divergence and Curl: Partial differentiation and Taylor series-Partial differentiation. Taylor series in more than one variable-Gradient of a scalar field-Gradients, conservative fields and potentials-Physical applications of the gradient.

UNIT- III

Divergence of a vector field -Physical interpretation of divergence-Laplacian of a scalar fieldCurl of a vector field-Physical interpretation of curl-Relation between curl and rotation-Curl and conservative vector fields.

PRESCRIBED TEXTBOOK :

- **P.C. Matthews, Vector Calculus**

REFERENCE BOOKS:

- **G.B. Thomas and R.L. Finney, Calculus**
- **H. Anton, I. Bivens and S. Davis ; Calculus**
- **Smith and Minton, Calculus**

SEMESTER VI

SEC

GRAPH THEORY

COURSE OBJECTIVE:

The students will be exposed to some basic ideas of graph theory.

COURSE OUTCOMES:

CO 1: Students will be able to appreciate the subject learnt.

CO 2: Define some basic concepts of graph theory.

CO 3: Determine isomorphism.

CO 4: Understand and draw paths and circuits.

CO 5: Apply Hamiltonian cycles.

CO 6: Establish shortest path algorithms.

UNIT-I

Graphs: A Gentle Introduction - Definitions and Basic Properties - Isomorphism.

UNIT- II

Paths and Circuits: Eulerian Circuits - Hamiltonian Cycles -The Adjacency Matrix Shortest Path Algorithms.

PRESCRIBED TEXTBOOK :

- **Edgar Goodaire and Michael M. Parmenter,Discrete Mathematics with Graph Theory (2e)**

REFERENCE BOOKS:

- **Rudolf Lidl and Gunter Pilz, Applied Abstract Algebra**
- **S Pirzada , Introduction to Graph Theeory.**

SEMESTER VI

GE1

QUANTITATIVE APTITUDE

COURSE OBJECTIVE:

The students will be aware of competitive aptitude.

COURSE OUTCOMES:

CO 1: Students will be able to appreciate the subject learnt.

CO 2: Find least common multiple (LCM), Highest common factor(HCF) and greatest common divisor (GCD) of given numbers.

CO 3: Evaluate square roots and cube roots.

CO 4: Compute percentages.

CO 5: Determine profit and loss.

CO 6: Calculate simple interest and compound interest.

CO 7: Solve problems based on ratio and proportion.

UNIT-I

Least common multiple (LCM), Highest common factor (HCF), Greatest common divisor (GCD), Square root, Cube root.

UNIT- II

Percentages, Profit and Loss, Simple Interest, Compound Interest, Ratio and Proportion.

PRESCRIBED TEXTBOOK :

- **Quantitative Aptitude by R.S.Agarwal.**

REFERENCE BOOKS:

- **Exam expert Quantitative Aptitude by Willey.**

SEMESTER VI

GE2

VERBAL AND LOGICAL REASONING

COURSE OBJECTIVE:

Students will be aware of competitive aptitude.

COURSE OUTCOMES:

After the completion of the course students will be in a position to

CO 1: Apply the verbal and logical reasoning concepts to solve problems on aptitude.

CO 2: Appreciate the verbal and logical reasoning techniques.

CO 3: Establish easy and shortcut methods.

CO 4: Understand coding and decoding.

CO 5: Solve time and work & time and distance problems.

CO 6: Determine the solutions of permutation and combination problems.

CO 7: Interpret the data.

UNIT-I

Sequences and series, coding and decoding, time and work, time and distance, data interpretation.

UNIT-II

Probability, permutation and combination - sitting arrangement, calendar problems.

PRESCRIBED TEXT BOOK :

Quantitative Aptitude by R.S. Agarwal

REFERENCE BOOKS:

Exam expert Quantitative Aptitude by Willey

FEW WEBSITES

- NPTEL: nptel.ac.in
- COURSERA: www.coursera.org
- MIT OCW: ocw.mit.edu
- ACADEMIC EARTH: www.AcademicEarth.org
- EdX : www.edx.org
- KHAN ACADEMY :www.khanacademy.org
- ALISON: www.Alison.com
- STANFORD ONLINE: www.online.stanford.edu
- VIDEO LECTURES: videolectures.net
- INTERACTIVE REAL ANALYSIS: mathcs.org
- VISUAL CALCULUS: archives.math.utk.edu/visual.calculus
- MOOCS CALCULUS: mooculus.osu.edu Few Math Softwares
- Useful for Classroom teaching: Geogebra (Freeware)
- Type setting software:LaTeX
- High end commercial softwares: Mathematica , Maple , Matlab

- Answering search engine: www.wolframalpha.com
- Group theory software: group explorer 2.2 (Freeware)
- Visualization software: Mathematics Visualization Toolkit (freeware)

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD-16

Affiliated To Osmania University, Re-Accredited With 'B^{+}' Grade by NAAC

DEPARTMENT OF MICROBIOLOGY

SYLLABUS (2020-2021)

MICROBIOLOGY

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B.Sc.

MICROBIOLOGY (2020-21)

Code	Course Title	Course Type	HPW	Credits
FIRST YEAR - SEMESTER-1				
BS	AEC-1			2
BS	English			4
BS	Second Language			4
BS	**General Microbiology**	DSC-1A	4+2	5
BS	Optional-II			5
BS	Optional-III			5
SEMESTER-2				
BS	AEC-2			2
BS	English			4
BS	Second Language			4
BS	**Microbial Diversity**	DSC-1B	4+2	5
BS	Optional-II			5
BS	Optional-I II			5
SECOND YEAR-SEMESTER-3				
BS	Haematology	SEC-1	2	2
BS	Food Fermentation Techniques	SEC-2	2	2
BS	English			3
BS	Second Language			3
BS	**Food & Environmental Microbiology**	DSC-1C	4+2	5
BS	Optional-II			5

BS	Optional-III			5
SEMESTER-4				
BS	Mushroom Cultivation	SEC-3	2	2
	Biofertilizers and Biopesticides	SEC-4	2	2
	English			3
BS	Second Language			3
BS	Medical Microbiology & Immunology	DSC-1 D	4+2	5
BS	Optional-II			5
BS	Optional-III			5
THIRD YEAR-SEMESTER-5				
BS501	Mushroom cultivation	SEC-3	2	2
BS502	Microbiology and Human health	GE-1	2	2
BS503	APPLIED MICROBIOLOGY	DSC-1E	3+2	4
BS506	A-IMMUNOLOGY B- PHARMACEUTICAL MICROBIOLOGY	DSE-1E	3+2	4
THIRD YEAR-SEMESTER-6				
BS601	G/H HOSPITAL WASTE MANAGEMENT	SEC-4	2	2
BS602	CONTAGIOUS DISEASES AND IMMUNISATION	GE-2	2	2
BS603	MEDICAL MICROBIOLOGY	DSC-1F	3+2	4

BS606	A-FOOD MICROBIOLOGY B- INDUSTRIAL MICROBIOLOGY	DSE-1F	3+2	4

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyze the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual.

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program Specific Outcomes (PSO)

1. **PSO-1** Can understand distribution, morphology and physiology of microorganisms
2. **PSO-2** Acquire skills in aseptic procedures, isolation and identification.
3. **PSO-3** Can understand concepts of immunology, virology, Microbial diversity and DNA technology
4. **PSO-4** Apply Specialized Microbiology Knowledge from Multiple Fields to Critically Analyze and Evaluate Microbiological, Environmental, and Health-Related Problems.
5. **PSO-5** Have sound knowledge about the fundamentals and applications of chemical and scientific theories
6. **PSO-6** Every branch of Science and Technology is related to Chemistry
7. **PSO-7** Easily assess the properties of all elements discovered.
8. **PSO-8** Apply appropriate techniques for the qualitative and quantitative analysis of chemicals in laboratories and in industries.

9. **PSO-9** Demonstrate applications of biochemical and biological sciences

10. PSO-10 Apply appropriate tools and techniques in biotechnological manipulation

11.PSO-11 Understand the responsibilities of biotechnological practices

DSC-1A Semester – I Course Title :- General Microbiology

Credits: 4+1=5

CO1: Can learn about history of microbiology, contributions of different scientists in the field of Microbiology and also applications related to this field.

CO2: Can learn about different types of microscopic techniques, measurement/calibration of microbes

CO3: Can learn about how to stain micro organisms using different staining techniques (dyes). By staining students can observe the shape and arrangement of cells. Students can also see the motility of bacteria by hanging drop method.

CO4: Can learn about classification of micro organisms. They can also learn about general characters of prokaryotic microorganisms.

CO5: Can learn about ultra structure of bacteria and viruses in detail. In addition students are also exposed to general characters and classification of eukaryotic micro organisms.

CO6: Can learn about different nutritional types in microrganisms and biochemical pathways underlying their mechanism.

CO7: Can learn about different sterilization techniques and mechanism of growth and facto

CO6: In practicals students will learn microscope handling, calibration, staining and morphology of some microorganisms.

DSC-1 Title: GENERAL MICROBIOLOGY 4HPW -Credits-4

Theory: 60 Lectures

UNIT-1: INTRODUCTION TO MICROBIOLOGY No. of hours: 15

Meaning, definition and scope. History of microbiology: Contribution of Louis Pasteur and Robert Koch, Edward Jenner, Antonie Van Leeuwenhoek, Alexander Flemming. Importance and application of Microbiology.

Principles of Microscopy-Bright field, Dark field, Phase-contrast, Fluorescent and Electron microscopy (SEM and TEM). Principles and types of stains-simple stain, differential stain, negative stain, structural stain-spore, capsule, flagella, Acid fast staining. Bacterial motility - Hanging drop method.

UNIT-2: STRUCTURE OF BACTERIA, VIRUSES & PURE CULTURE CONCEPT

No. of hours: 15

Prokaryotes – Ultra structure of eubacteria. - General characteristics of viruses, differences between bacteria and viruses. Classification of viruses

Morphology and structure of TMV and HIV. Structure and multiplication of lambda

bacteriophage.

Isolation of pure culture techniques- Enrichment culturing, Dilution plating, streak plate, spread plate, pour plate method, Micromanipulator. Preservation of Microbial cultures — Sub culturing, overlaying cultures with minerals oils, lyophilization, glycerol stocks, sand cultures, storage at low temperature,

UNIT-3: MICROBIAL NUTRITION AND METABOLISM No. of hours: 15

Microbial Nutrition — Nutritional requirement, Uptake of nutrients by cell. Nutritional groups of microorganisms — Autotrophs, Heterotrophs, Mixotrophs. Components and types of bacterial growth media — simple and complex media, algal Medium, mineral salts medium, nutrient agar medium, MacConkey agar and blood agar.

Respiration — Glycolysis, HMP Pathway, ED Pathway , TCA Cycle and Anaplerotic reaction, Electron Transport, Oxidative and substrate level phosphorylation.

UNIT-4: STERILIZATION TECHNIQUES AND MICROBIAL GROWTH

No. of hours: 15

SteriliZation and disinfection techniques - Physical methods- Autoclave, Hot air oven, Laminas air flow, **ultrasonication,** Filter sterilization. Radiation methods - U. V rays, Gamma rays, Ultrasonic methods. Chemical methods - Alcohols, Aldehydes, Phenol, Halogens and Hypochlorides.

Microbial growth — Different Phases Of Growth in Batch culture. Factors Influencing microbial growth. Synchronous, Continuous, Biphasic Growth. Methods for measuring microbial growth

Direct Microscopic, Viable count, Turbidometry, Biomass.

References:

1. Michael J. Pelczar, Jr. E.C.S.Chan, Noel R. Krieg Microbiology Tata McGraw- Hill Publisher.

2. Prescott, M.J., Harly, J.P. and Klein Microbiology 2 n d Edition, WCB McGrawHill, New York.

3. Madigan, M.T., Martinkl, I.M and Parker,j. Broch Biology Of Microorganism, 9th Edition, MacMillan Press, England.

4. Dube, R.C. and Maheshwari, D.K. General Microbiology S Chand, New Delhi.

5. Ananthanarayan and Panicker, Medical Microbiology.

I Semester

DSC-1A General Microbiology

PRACTICALS **2HPW-Credits-1**

1. Handling and calibration of light microscope.
2. Simple and differential staining (Gram staining), Spore staining.
3. Microscopic observation of cyanobacteria (*Nostoc, Spirulina*), algae and fungi (*Saccharomyces, Rhizopus, Aspergillus, Pencillium, Fusarium*).
4. Isolation of T2 bacteriophage from sewage sample.
5. Preparation of media for culturing autotrophic and heterotrophic microorganisms — algal Medium, mineral salts medium, nutrient agar medium, MacConkey agar and blood agar.
6. Sterilization techniques: Autoclave, Hot air oven and filtration.
7. Enumeration of bacterial numbers by serial dilution and plating (viable count)
8. Isolation of pure cultures by streak, spread and pour plate techniques
9. Preservation of microbial cultures- Slant, Stab, Sand cultures, mineral oil overlay and glycerol stocks
10. Turbidometric measurement of bacterial growth and plotting growth curve.

References:

- Experiments in Microbiology by K.R. Aneja.
- Gopa1Reddy.M., Reddy. M.N., SaiGopal, DVR and Mallaiah K.V. Laboratory Experiments in Microbiology.

- Dubey, R.C. and Maheshwari, D.K. Practical Microbiology, S. Chand and Co New Delhi.
- Alcamo, I.E. Laboratory Fundamentals of Microbiology. Jones and Bartlett Publishers. USA.

Semester – II **Course Title :- MICROBIAL DIVERSITY**

CO1: Concept of Biodiversity– Can learn about elements of biodiversity, its economic value. Students can also learn about classification of living organisms and get an idea about Bergey's manual.

CO2: Prokaryotic Microbial Diversity– Here students will learn about diversity of prokaryotic microorganisms such as Archaebacteria, Cyanobacteria etc.

CO3: Eukaryotic Microbial Diversity – Students will learn about diversity of eukaryotic microorganisms such as fungi, algae, protozao etc.

CO4: Microbial Ecosystems – Students can learn about interactions between microorganisms in addition to understanding about microbiome and other ecosystems.

CO5: PRACTICALS - In practicals students are made to learn isolation of methanogens, halophiles, cyanobacteria etc.

CO6: PRACTICALS – Students can learn about how to observe algae, protozoa, making of winogradsky column that shows microbial diversity.

DSC-1B **B.Sc. I Year: II Semester**

Title: MICROBIAL DIVERSITY **4HPW - Credits-4**

UNIT 1: CONCEPT OF BIODIVERSITY

Basic concept of Biodiversity and Conservation. Elements of Biodiversity - Ecosystem Diversity, Genetic Diversity, Species Abundance & Diversity. Economic Value of Biodiversity & Legal, Ethical and Conservation issues related to uses of biodiversity.

Classification of living organisms; Haeckel, Whittaker and Carl Woese systems. Differentiation of prokaryotes and eukaryotes. Classification of bacteria as per the second edition of Bergey's manual of systematic bacteriology.

UNIT 2: PROKARYOTIC MICROBIAL DIVERSITY

General characteristics of eubacteria. Rickettsia and Mycoplasma. Microbial richness: Exploration, significance, conservation and applications. Structural and physiological diversity of Archaea bacteria, Metabolic characteristics of extremophiles (Methanogens. Halophiles, thermoacidophiles).

Gram negatives: Cyanobacteria and Proteobacteria, Gram positives and heterogenous members including Fermicutes, Actinobacteria, Bacteroidetes, Acidobacteria and Planctomycetes.

UNIT 3: EUKAROTYIC MICROBIAL DIVERSITY

Eukaryotic microbial diversity. Structural, physiological and metabolic characteristics of Algae - Cyanophyta, Chlorophyta, Bacillariophyta, Phacophyta, Rhodophyta; Fungi -Phycomycetes, Basidiomycetes, Zygomyetes, Oomycets, Asomycetes, Deuteromycetes (imperfect and perfect stages) and Protozoa - Giardia, Entamoeba and Plasmodium.

UNIT 4: MICROBIAL ECOSYSTEMS

Microbial interactions: Symbiosis, neutralism, commensalism, competition, antagonism, synergism, parasitism.

Understanding microbial diversity with cultivated vs uncultivated microorganisms.

The Great Plate count anomaly. Cultivation independent methods to assess microbial diversity.

Preserved and penurbed microbial ecosystems, microbiome for sustainable agroecosystems. Human microbiome.

References:

1. Pelczar 3r. M.J . Chan. E.C.S and Kreig.N.R (2006)."Microbiology"- 5th Edition McGraw Hill Inc. New York.

2. David, B.D., Delbecco,. R., Eisen, H.N and Ginsburg, H.S (1 990) "Microbiology" 5 Edition. Harper & Row, New York.3.Stainer, R.Y., Ingraham, J.L., Wheelis, M.L and Painter, P.R. (1986). "General Microbiology" - Mac Milan Education Ltd. London.

4.Brown J. W. (2015) Principles of Microbial Diversity, ASM PfCSS

5.Epstein S.S. (2009) Uncultivated microorganisms, Springer-Verlag Publishers

6.Madigan M.T., Bender K.S., Buckley D.H., Sattley W.M. and Stahl D.A. (2017) Brock Biology of Microorganisms, 15'h Edu. (Global Edn.)Pearson Education

MICROBIAL DIVERSITY PRACTICALS

2HPW-Credits-1

- Isolation of Methanogenic bacteria from manure by anaerobic culturing
- Isolation and enumeration of halophiles from saline environment
- Isolation of bacteria from diversified habitats to demonstrate antagonism, commensalism and synergism
- Isolation of *C yanobacteria* and fungi from different habitats
- ldeniification of fungi by staining techniques
- Microscopic observation of soil algae and Protozoa
- Winogradsky's column to demonstrate microbial diversity
- Visit and observe any nearby unique ecosystems to understand the role of microorganisms
- Demonstration of the great plate count anomaly

References:

- Aneja. K.R. (200 l). Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom Production Technology, 3rd Edition, New Age lnternational (P) Ltd.. New Delhi.
- Dubey, R.C. and Maheswari, D.K. (2002). Practical Microbiology, S. Chand & Co., New Delhi.
- Burns. R.G. and Slater, I.H, (1982a. Experimental Microbiology and Ecology. Blackwe1l Scientific Publications, USA.
- Peppler, 1. L. and Gerba, C.P. (2004). Environmental Microbiology — A Laboratory Manual.Academic Press. New York.
- S. Gupte, S. (1995). Practical Microbiology. Jaypee Brothers Medical Publishers Pvt. Ltd.
- Kannan, N. (2003). Hand Book of Laboratory Culture Medias, Reagents, Stains and Buffers.Panima Publishing Co., New Delhi.
- Gopal Reddy, M., Reddy, M.N., Saigopal, DVR and Mallaiah, K.V. (2007). Laboratory Experiments in Microbiology, 2nd edition.Himalaya Publishing House, Mumbai.
- Reddy. S.M. and Reddy. S.R. (1998). Microbiology — Practical Manual, 3rd Edition, Sri Padinavathi Publications, Hyderabad

Course Code :-BS304 Program :- B.Sc. Semester – III

Course Title :- Haematology HPW :- 2 Credits – 2

Course type: SEC-1

CO1: students can learn about different concepts such as composition of blood (RBC, WBC, Plasma, Serum, Platelet cells).

CO2: Staining of blood films, Total blood picture, Differential count, Blood grouping, Rh-typing, Blood haemoglobin, Anticoagulants.

CO3: Here students can learn about Blood transfusion (Principles), Blood preservation, Precautions of handling blood and it's products.

CO4: students are made aware of diseases related to blood such as Hemophilia, Anaemia and ESR technique.

Title: HAEMATOLOGY III SEMESTER

Code: BS, SEC-1

UNIT-1: INTRODUCTION TO BLOOD

Blood: definition, characters, composition. Collection of blood — capillary blood: from adults and infants, examinations employed. Venous blood: from adults and infants, examinations employed composition of blood (RBC, WBC, Plasma, Serum, Platelet cells), Staining of blood films. Total blood picture, Differential count. Blood grouping, Rh-typing. Haemoglobin: composition and normal values, haemoglobin estimation Anti-coagulants.

UNIT-2: BLOOD TRANSFUSION

Principles of blood transfusion, Donor screening — cross matching, collection of blood, preservation and storage. Precautions of handling blood and it's products. Challenges in management of Hemophilia and Anaemia. General account on spread of diseases through blood and blood products. Coagulation mechanism: factors, bleeding time, clotting time. Haematological indices: packed cell volume. Eryththrocyte sedimentation: principle — determination.

References:

1. Kawthalbar.Essentials of Haematology Paperback — 2013

2. Lokwani.D.P.The ABC of CBC Interpretation of Complete Blood Count and Histograms Paperback 2013

3. RamnikSood . Medical Laboratory technology Methods and Interpretation Jaypee Publications.

4. ShirishMKawthalkar. Essential Of Hematology. Jaypee Publication

SEC-2: FOOD FERMENTATION TECHNIQUES

Semester – III **Course Title :- Haematology HPW :- 2 Credits – 2**
Course type: SEC-2

CO1: Students can learn about different fermented foods such as milk based products and grain based products.

CO2: Students can understand the concept of probiotics

CO3: Can learn about various food products made from fermented vegetables.

CO4: Can study about fermented fish and meat products.

B.Sc. II Year, III semester

Title: FOOD FERMENTATION TECHNIQUES 2HPW-Credits-2

Unit 1 Fermented Foods

Definition, types, advantages and health benefits, **Milk Based Fermented Foods -** Dahi, Yogurt, Buttermilk (Chach) and cheese: Preparation of inoculums, types of microorganisms and production process, **Grain Based Fermented Foods -** Soy sauce, Bread, Idli and Dosa: Microorganisms and production process

Unit 2 Probiotics & Fermented Foods

Vegetable Based Fermented Foods -Pickels, Saeurkraut: Microorganisms and production process

Fermented Meat and Fish- Types, microorganisms involved, fermentation process, **Probiotic Foods-**

Definition, types, microorganisms and health benefits

Suggested Readings

1. Hui YH, Meunier-Goddik L, Josephsen J, Nip WK, Stanfield PS (2004) Handbook of food and fermentation technology, CRC Press

2. Holzapfel W (2014) Advances in Fermented Foods and Beverages, Woodhead Publishing.

3. Yadav JS, Grover, S and Batish VK (1993) A comprehensive dairy microbiology, Metropolitan

4. Jay JM, Loessner MJ, Golden DA (2005) Modern Food Microbiology, 7th edition. Springer

Code: BS, DSC-IC B.Sc II year: III Semester

Title: FOOD AND ENVIRONMENTAL MICROBIOLOGY

4 HPW-Credits-4

Course Outcomes:

CO1: Can gain knowledge about the concept of fermented foods such as pickles, idly, etc.

CO2: Can learn about role of microorganisms in milk products.

CO3: Can understand what are probiotics and prebiotics.

CO4: Can understand why and how foods are spoiled

CO5: Can gain knowledge about various food preservation methods

CO6: Study about how food quality is assessed and screened.

CO7: Can learn about microorganisms present in air, water.

CO8: Can understand how sewage is being treated under aerobic and anaerobic conditions.

CO9: Can learn about soil and its properties, type of microorganisms present in soil

CO10: Can study about interactions between plants and microorganisms

CO11: Can understand the importance of bioremediation.

CO12: Can study about the microorganisms role in operation of carbon and nitrogen cycle in the atmosphere.

Title: FOOD AND ENVIRONMENTAL MICROBIOLOGY

UNIT 1: FERMENTED FOODS

Introduction to fermented foods; Health aspects of fermented foods; Fermented vegetables: Processing and fermentation of Sauerkraut and pickles, idly. Dairy Microbiology - Types of microorganisms in milk, significance of microorganisms in milk, Microbial products of milk- Bulgarian milk, Kefir, cheese, yogurt; Microorganisms as food; Probiotics and Prebiotics.

UNIT 2: MICROBIAL FOOD SPOILAGE AND POISONING

Microbial Spoilage of foods; Microbial Food poisoning, risks and hazards; Mycotoxins and their poisoning/toxicity; Food preservation methods and food safety issues. Food Quality: Importance and functions of quality control. Methods of quality assessment of foods; Screening and Enumeration of spoilage microorganisms, Detection of pathogens in food.

UNIT 3: AIR AND WATER MICROBIOLOGY

Microorganisms in air and their importance (brief account); Microorganisms and water pollution Water-borne pathogenic microorganisms and their transmission; Sanitary quality of water; Water pollution due to degradation of organic matter; Aerobic and Anaerobic sewage treatment,

UNIT 4: SOIL MICROBIOLOGY

Soil properties (physical, chemical and biological), Soil microorganisms, Methods of enumeration and activity of microbes in environment/soil; Microbes and plant interactions — Rhizosphere, Phyllosphere and Mycorrhizae; Introduction to Microbial Bioremediation, Microbial degradation of organic pollutants; Carbon and Nitrogen cycle.

References:

1. Stanbiiry, P.F., Whitaker, A. and Hall, S.J. (1997). Principles of Fermentation Technology,

Aditya Books (P) Ltd. New Delhi.

2. Doyle, M.P., Beuchat, L.R. and Montville, T.J. (1997). Food Microbiology: Fundamentals and FrOntiers.ASM Press, Washington D.C., USA.

3. Frazier, W.C. and Westhoff, D.C. (1988). Food Microbiology, MeGraw-Hill, New York.

4. Jay, J.M. (1996). Modern Food Microbiology, Chapmand Has, New York.

5. Ray, B. (1996). Fundamentals of Food Microbiology, CRC Press, USA.

6. Rangaswami, G. and Bhagyaraj, D.J. (2001). Agricultural Microbiology, 2nd Edition, Prentice Hall of India, New Delhi.

7. Atlas, R.M. and Banha, R. (1998). Microbial Ecology - Fundamentals and Applications, Addison Wesley Longman, Inc., USA

8. Paul, E.A. and Clark, F.E. (1989). Soil Microbiology and Biochemistry, Academic Press.

USA.

FOOD AND ENVIRONMENT MICROBIOLOGY PRACTICALS 2HPW-Credits-1

- Determination of microbiological quality of milk by MBRT method.
- Isolation of fungi & bacteria from spoiled fruits/vegetables/Mi1k/Meat products.
- Isolation of microorganisms from air by impringement method.
- Microbiological examination of water by coliform test.
- Determination of biological Oxygen demand.
- Extraction of Mycotoxins from contaminated grains/foods.
- Detection of Mycotoxins
- Isolation and identification of probiotic bacteria
- Isolation and identification of probiotic yeast

References:

1. Stanbury, P.F., Whitaker, A. and Hall, S.J. (1997). Principles of Fermentation

Technology, Aditya Books (P) Ltd. New Delhi.

2. Doyle, M.P., Beuchat, L.R. and Montville, T.J. (1997). Food Microbiology:

Fundamentals and Frontiers.ASM Press, Washington D.C., USA.

3. Frazier, W.C. and Westhoff, D.C. (1988). Food Microbiology, McGraw-Hill, New York.

4. Jay, J.M. (1996). Modem Food Microbiology, Chapman and Hall, New York.

5. Ray, B. (1996). Fundamentals of Food Microbiology, CRC Press, USA.

Atlas, R.M. and Bartha, R. (1998). Microbial Ecology - Fundamentals and Applications, Addison Wesley Longman, Inc., USA

IV Semester **Title: MUSHROOM CULTIVATION**

Code: BS SEC-3 **2HPW** **Credits: 2**

Course Outcomes:

CO1: Can learn about mushrooms and their history.

CO2: Can gain knowledge about edible mushrooms and their global status of production

CO3: Can know about nutritional and health benefits of mushrooms

CO4: can learn in detail about steps involved in mushroom production.

CO5: Can learn about pests and pathogens of mushrooms and post harvest handling and care of mushroom production.

Title: MUSHROOM CULTIVATION **Code: BS SEC-3**

UNIT-I

Introduction to mushroom cultivation. Importance and history of mushroom cultivation in India. Global status of mushroom production. Edible mushrooms (white button oyster, Paddy straw). Nutritional value and health benefits of mushrooms

UNIT-2

Steps in mushroom cultivation

a.Selection of site and types of mushroom b.Mushroom farm structure, design layout

c.Principle and techniques of compost and Composting d.Principle of spawn production

e.Casing and crop production

f. Harvesting and marketing

g. Entrepreneurship development in Mushroom cultivation

Pests and pathogens of mushrooms

Post harvest handling and preservation of mushrooms

Reference:

- Mushroom cultivation in india by B.C.Suman and V.P. Sharma Published by Daya publishing house New Delhi.
- Mushrooms Cultivation, Marketing and Consumption Manjit Singh Bhuvnesh Vijay Shvet Kama l G.C. Wakchaure Directorate of Mushroom Research (Indian Council Of Agricultural Research) Chambaghat. Solan —17321 3 (HP)

SKILL ENHANCEMENT COURSE IV – (SEC-IV)

Code: BS, SEC-4 BSc **III year: IV Semester**

Title: Biofertilizers and Biopesticides 2HPW-Credits-2

Course outcomes:

CO1: Students can learn about different biofertilizers and bioinsecticides.

CO2: Can learn about Rhizobium biofertilizer production and applications.

CO3: Can learn about microbes used as bioinsecticides and their advantages.

CO4: Can learn about isolation, characters of Azospirillum and Azotobacter.

CO5: Can study about phosphate solubilizers.

CO6: Can gain knowledge about mycorrizae and their importance.

Biofertilizers and Biopesticides **SEC-4**

Unit 1 Biofertilizers and Bioinsecticides

General account of the microbes used as biofertilizers for various crop plants and their

advantages over chemical fertilizers. Symbiotic N_2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants Frankia - Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis. Cyanobacteria, Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application. General account of microbes used as bioinsecticides and their advantages over synthetic pesticides, Bacillus thuringiensis, production, Field applications.

Unit 2 Non symbiotic Nitrogen Fixation and phosphate solubilization

Free living Azospirillum, Azotobacter - free isolation, characteristics, mass inoculums, production and field application. Phosphate Solubilizers- Phosphate solubilizing microbes - Isolation, characterization, Mass inoculum production, field application. Mycorrhizal Biofertilizers-

Importance of mycorrizal inoculum, types of mycorrhizae and associated plants, Mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM.

Suggested Readings

1. Kannaiyan, S. (2003). Bioetchnology of Biofertilizers, CHIPS, Texas.

2. Mahendra K. Rai (2005). Hand book of Microbial biofertilizers, The Haworth Press, Inc. New York.

3. Reddy, S.M. et. al. (2002). Bioinoculants for sustainable agriculture and forestry, Scientific Publishers.

4. Subba Rao N.S (1995) Soil microorganisms and plant growth Oxford and IBH publishing co. Pvt. Ltd. NewDelhi.

5. Saleem F and Shakoori AR (2012) Development of Bioinsecticide, Lap Lambert Academic Publishing GmbH KG 6. Aggarwal SK (2005) Advanced Environmental Biotechnology, APH publication.

Code: BS, DSC-ID **4 HPW** **Credits-4**

Title: MEDICAL MICROBIOLOGY & IMMUNOLOGY

CO1: Can learn about concepts of normal flora, bacterial toxins and antimicrobial resistance.

CO2: Can get knowledge about air borne, food and water borne, and sexually transmitted diseases.

CO3: Can learn about zoonotic diseases and nosocomial infections.

CO4: Can learn about cells and organs of immune system.

CO5: Can get knowledge about concepts of antigen and antibody.

CO6: Can learn about antigen-antibody reactions and immunoflouresence techniques.

Title: MEDICAL MICROBIOLOGY & IMMUNOLOGY

UNIT-1: MEDICAL BACTERIOLOGY

History of Medical Microbiology. Normal flora of human body, Host pathogen interactions.Bacterial toxins, virulence and attenuation. AntimicrobiaI resistance.

Air borne diseases -Tuberculosis.

Food and waterborne diseases- Cholera, Typhoid.

Contact diseases - Syphilis. Gonorrhea. General account of nosocomial infections.

UNIT-2: MEDICAL VIROLOGY AND PARASITOLOGY

Food and waterborne diseases - Poliomyelitis. Amoebiasis.

Insect borne diseases-Malaria, Dengue fever.

Zoonotic diseases — Rabies

Viral diseases- Hepatitis B, HIV, SARS, MERS: Air borne diseases- *Influenza.*

UNIT-3: INTRODUCTION TO IMMUNOLOGY

History of immunology. Cells and organs of immune system- Primary and Secondary lymphoid organs. Functions of B&T Lymphocytes, Natural killer cells, Polymorphonuclear cells. Structure and classification of Antigens, Factors affecting

antigenicity.

Antibodies-Basic structure. Types, properties and functions of Immunoglobulins.

Types of immunity-Innate and Acquired; Humoral and cell mediated immune response. Major Histocompatibility Complex- Class 1 and 11

UNIT-4: IMMUNOLOGICAL DISORDERS AND AG-AB REACTI ONS

Types of hypersensitivity - lmmediate and delayed. Systemic and localized autoimmune disorders Complement pathways — Classical and Alternate.

Types of Antigen-Antibody reactions- Agglutination, blood groups, precipitation, neutralization, complement fixation test. Labeled antibody based techniques-ELISA, RIA and

Immunofluorescence: Polyclonal and monoclonal antibodies production and application

References:

1. Gottschalk. G. (1986). Bacterial Metabolism, Springer-Verlag,New-York.
2. Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. Brown PubliCations, Iowa, USA.
3. Moat. A.G. and Foster. J. W. (1995). Microbial Physiology, John-Wiley, New York.
4. White, D. (1995). The Physiology and Biochemistry of Prokaryotes, Oxford University Press, NewYork.
5. Reddy, S.R. and Reddy, S.M. (2004). Microbial Physiology, Scientific Publishers, Jodhpur, India.
6. Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry. 2nd Edition. CBS Publishers and Distributors, New Delhi.
7. Elliot, W.H. and Elliot, D.C. (2001). Biochemistry and Molecular Biology, 2nd Edition, Oxford University Press, U.S.A.

MEDICAL MICROBIOLOGY & IMMUNOLOGY PRACTICALS

2HPW- Credits-1

Determination of blood grouping and RH typing.

Total count of RBC and WBC.

Differential count of blood leucocytes.

WIDAL test for typhoid(slide test)by Ag-Ab reactions

VDRL test for syphilis (slide test) by Ag-Ab reactions.

Ouchterlony double diffusion test

Separation of serum and plasma

IMViC test - lndole test, Methyl red test, VogesProskauer test, Citrate utilization test.

Oxidase test.

Catalase test.

Antibiotic sensitivity testing — Disc diffusion method

References:

- Gopal Reddy, M.. Reddy, M.N., Saigopal, DVR and Mallaiah, K.V. (2007). Laboratory Experiments in Microbiology, .Himalaya Publishing House, Mumbai.
- Experiments in MlCFObiology by K.R. Aneja.

Code: BS 503, DSC-1E B.Sc III year, SEMESTER-V

Title: APPLIED MICROBIOLOGY 3 HPW Credits-3

CO 1 – Students made to learn about Physical and chemical characteristics of soil; Rhizosphere and phyllosphere, Plant growth promoting microorganisms; Biofertilizers

CO 2 Plant Diseases & Biocontrol

Students learn about diseases in plants and advantages and making of biopesticides

CO 3 Microbial ecology

Students are made to understand concept of nitrogen fixation (symbiotic,non symbiotic); Role of microorganisms in nutrient cycles and Microbial interactions.

CO 4 Role of microbes in environmental Pollution

Students can learn about microbiology of potable and polluted water, Sanitation of potable water and Sewage treatment. In addition to this they can also learn about Solid waste disposal and biodegradation of environmental pollutants –pesticides

SEMESTER-V Title: APPLIED MICROBIOLOGY

UNIT-1 - Microbes in Agriculture

Physical and chemical characteristics of soil; Rhizosphere and phyllosphere

Plant growth promoting microorganisms;

(*mycorrhizae,rhizobium,azospirillum,azatobacter,cynobacteria,frankia* and phosphate solubilising microorganisms); Biofertilizers- *Rhizobium & Cyanobacteria*

UNIT-2 Plant Diseases & Biocontrol

Concept of disease in plant Symptoms of plant diseases caused by fungi (ground nut rust),bacteria (angular Leaf spot cotton) and viruses (tomato leaf curl) Principles of plant disease control Biological control of plant diseases, Biopesticides-*Bacillus thuringenisis*, Nuclear polyhedrosis virus (NPV), *Trichoderma*

UNIT-3 Microbial ecology

Outline classification of nitrogen fixation (symbiotic,non symbiotic); Microorganisms of environment soil, water, air; Role of microorganisms in nutrient cycles (carbon,nitrogen,sulphur) Microbial interaction-mutalism, commensalism, antagonism, competition, parasitism, predation

UNIT-4 Role of microbes in environmental Pollution

Microbiology of potable and polluted water. *E.coli* and *Streptococcus faecalis* as indicators of water pollution. Sanitation of potable water. Sewage treatment (primary, secondary and tertiary) Solid waste disposal-sanitary landfills composting. Outline of biodegradation of environmental pollutants –pesticides

References:

1. Alexander, M. (1985). Introduction to Soil Microbiology, 3rd Edition. Wiley Eastern Ltd., New Delhi.

2. Paul, E.A. and Clark, F.E. (1989). Soil Microbiology and Biochemistry, Academic Press, USA.

3. Subba Rao, N.S. (1993). Biofertilizers in Agriculture and Forestry, 3rd Edition Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

4. Rangaswami, G. and Bhagyaraj, D.J. (2001). Agricultural Microbiology, 2nd

Edition, Prentice Hall of India, New Delhi.

5. Atlas, R.M. and Bartha, R. (1998). Microbial Ecology - Fundamentals and Applications, Addison Wesley Longman, Inc., USA

6. Lynch, J.M. and Poole, N.J. (1979). Microbial Ecology – A Conceptual Approach,

Blackwell Scientific Publications, USA

7. Subba Rao, N.S. (1999). Soil Microorganisms and Plant Growth. Oxford & IBH

Publishing Co. Pvt. Ltd., New Delhi.

8. Reddy, S.R. and Singara Charya, M.A. (2007). A Text Book of Microbiology - Applied Microbiology. Himalaya Publishing House, Mumbai.

9. Singh, R.P. (2007). Applied Microbiology. Kalyani Publishers, New Delhi.

Practical syllabus **2 HPW-CREDITS-1**

- · Isolation & enumeration of Rhizosphere microorganisms.
- · Isolation & identification of Phyllosphere microorganisms.
- · Study of root nodules of leguminous plants.
- · Isolation of Rhizobium from leguminous root nodules.
- · Isolation of *Azospiriullum* and *Azotobacter*.
- · Staining & observation of VAM fungi.
- · Isolation of microorganisms in air by solid/liquid impingement method.
- · Plant diseases-Rust, Smuts, Powdery mildews, Tikka disease of ground nut, citrus
- canker, bhendi yellow vein mosaic, tomato leaf curl, little leaf of brinjal.
- · Microbial quality testing of water by coliform test
- · Determination of Biological oxygen demand (BOD) of water

References:

1. Aneja, K.R. (2001). Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom Production Technology, 3rd Edition, New Age International (P) Ltd., New Delhi.

2. Dubey, R.C. and Maheswari, D.K. (2002). Practical Microbiology, S. Chand & Co., New Delhi.

3. Burns, R.G. and Slater, J.H. (1982). Experimental Microbiology and Ecology. Blackwell Scientific Publications, USA.

4. Peppler, I.L. and Gerba, C.P. (2004). Environmental Microbiology – A Laboratory Manual. Academic Press. New York.

5. Gupte, S. (1995). Practical Microbiology. Jaypee Brothers Medical Publishers Pvt. Ltd.

6. Kannan, N. (2003). Hand Book of Laboratory Culture Medias, Reagents, Stains and Buffers. Panima Publishing Co., New Delhi.

7. Gopal Reddy, M., Reddy, M.N., Saigopal, DVR and Mallaiah, K.V. (2007). Laboratory Experiments in Microbiology, 2nd edition. Himalaya Publishing House, Mumbai.

8. Reddy, S.M. and Reddy, S.R. (1998). Microbiology – Practical Manual, 3rd Edition, Sri Padmavathi Publications, Hyderabad.

SEC-3 5th semester Title: Mushroom cultivation

CO 1· Students are made to learn about importance of mushrooms, their cultivation method and its status in India.

CO 2 · Students can learn about Steps in mushroom cultivation

Title: Mushroom cultivation 2 HPW-credits-2

Unit-1

Introduction to mushroom cultivation, Importance and history of mushroom cultivation in India, Global status of mushroom production, Food value of mushroom

Unit-2

Steps in mushroom cultivation,

a.Selection of site and types of mushroom

b.Mushroom farm structure, design layout

c.Principle and techniques of compost and composting

d.Principle of spawn production

e.Casing and crop production

f. Harvesting and marketing

Pest and pathogens of mushrooms, Post harvest handling and preservation of mushrooms

Reference:

1. Mushroom cultivation in India by B.C.Suman and V.P. Sharma Published by Daya publishing house New Delhi.

2. Mushrooms Cultivation, Marketing and Consumption Manjit Singh Bhuvnesh Vijay Shwet Kamal G.C. Wakchaure Directorate of Mushroom Research (Indian Council of Agricultural Research) Chambaghat, Solan –173213 (HP)

GE-1 5th semester Title: Microbiology and Human health

CO 1: Non-microbiology students are made to learn about history of microbiology, contributions of different scientists, basic culture techniques such as staining, and cultivation methods.

CO 2: In this students are made to learn about Microorganisms related to human health i.e. Normal microbial flora, and some pathogens.

Title: Microbiology and Human health 2 HPW-credits-2

Unit-1:

Historic developments of Microbiology, contributions of Van Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch.

Types of microorganisms, Morphological characteristics of bacteria, Staining, cultivation methods of bacteria, Culture Media.

Unit-II:

Microorganisms related to human health. Normal microbial flora, Pathogenic microbes and their diseases - typhoid, T.B, syphilis, AIDS, Influenza.

References:

1. Michael J. Pelczar, Jr. E.C.S.Chan, Noel R. Krieg Microbiology Tata McGraw- Hill Publisher.

2. Prescott, M.J., Harly, J.P. and Klein Microbiology 5th Edition, WCB Mc GrawHill, New York.

3. Madigan, M.T., Martinkl, J.M and Parker,j. Broch Biology of Microorganism, 9th Edition, MacMillan Press, England.

4. Dube, R.C. and Maheshwari, D.K. General Microbiology S Chand, New Delhi.

5. Ananthanarayan and Panikar. Text book of Microbiology. Universities Press.

5th semester **Title: IMMUNOLOGY**

CO 1 HISTORY OF IMMUNOLOGY AND IMMUNITY

Students are made to learn about concepts of immunology such as antigens, antibodies, complement and types of immunity.

CO 2 CELLS AND ORGANS OF IMMUNE SYSTEM

Students can learn about Primary and secondary organs of immune system and cells of immune system.

CO 3 ANTIGENS AND ANTIBODY REACTION

Students can learn about Components of complement and activation of complement, types of antigens-Antibody reactions, Labeled antibody based techniques

CO 4 IMMUNOLOGICAL PROCESSES AND APPLICATIONS

In this section students can learn about types of hypersensitivity, autoimmunity, monoclonal antibodies and vaccines.

DISCIPLINE SPECIFIC ELECTIVE-(DSE-IE) - A

Title: IMMUNOLOGY **3 HPW-credits-4**

UNIT-1 HISTORY OF IMMUNOLOGY AND IMMUNITY

Development of immunology; Antigen – types,chemical nature, Molecular size, Heterogeneity, Antigenic determinants, Haptens, Factors affecting antigenicity.; Antibodies-Basic structure,Types,properties and functions of immunoglobulins.; Complement, components of complement and activation of complement-Classical, alternative and lectin pathways.

Types of immunity-Innate, Acquired; Active and passive, humoral and cell mediated immunity.

UNIT-2 CELLS AND ORGANS OF IMMUNE SYSTEM

Primary and secondary organs of immune system- Thymus, bursa of fabrica, bone marrow, spleen and lymph nodes, mucus associated lymphoid tissue (MALT).

Cells of immune system, Identification and functions of B &T Lymphocytes, NK cells, Null cells, Mast cells, Monocytes, Dendritic cells, Macrophages, Neutrophils, Basophils and Eosinophils.

UNIT-3 ANTIGENS AND ANTIBODY REACTION

Components of complement and activation of complement.

Types of antigens-Antibody reactions- Agglutination, blood groups, precipitation, neutralization, complement fixation.; Labeled antibody based techniques-ELISA, RIA and Immuno flouresence

UNIT-4 IMMUNOLOGICAL PROCESSES AND APPLICATIONS

Types of hypersensitivity immediate and delayed.; Autoimmunity and its significance.

Polyclonal and monoclonal antibodies production and application, Vaccines-Natural and recombinants.

References:

1. Sudha Gangal. Shubhangi Sontakke. Text book of Basic and Clinical Immunology,

University Press.

2. Tizard, I.R. (1995). Immunology : An Introduction, WB Saunders, Philadelphia, USA.

3. Riott, I.M. (1998). Essentials of Immunology, ELBS and Black Well Scientific

Publishers, England.

4. Goldsby, Kindt, T.J. and Osborne, B.A. (2004). Kuby Immunology, 6th Edition,

W.H.Freeman and Company, New York.

5. Lydyard, P.M., Whelan, A. and Fanger, M.W. (2000). Instant Notes in Immunology, Viva Books Pvt. Ltd., New Delhi.

6. Chakraborty, B. (1998). A Text Book of Microbiology, New Central Book Agency (P) Ltd, Calcutta, India.

7. Ananthanarayana, R. and Panicker, C.K.S. (2000). Text Book of Microbiology, 6th Edition, Oriental Longman Publications, USA.

8. Annadurai, B. (2008). A Textbook of Immunology and Immunotechnology. S. Chand & Co. Ltd., New Delhi.

9. Dey, N., T.K. and Sinha, D. (1999). Medical Bacteriology Including Medical Mycology and AIDS. New Central Book Agency (P) Ltd. Calcutta, India.

10. Shetty, N. (1994). Imuunology – Introductory Textbook. New Age International Pvt. Ltd., New Delhi.

11. Singh, R.P. (2007). Immunology and Medical Microbiology. Kalyani Publishers, New Delhi.

12. Reddy, S.R. and Reddy, K.R. (2006). A Text Book of Microbiology - Immunology and Medical Microbiology, Himalaya Publishing House, Mumbai.

13. Gupta, S. (1995). Short Text Book of Medical Microbiology, 8th Edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.

IMMUNOLOGY Practicals **B.Sc III year: 5th semester**

- Determination of blood grouping and RH typing.
- Total count of RBC and WBC. Differential count of blood leucocytes.
- Estimation of blood Haemoglobin.
- WIDAL test for typhoid(slide test)by Ag-Ab reactions.
- VDRL test for syphilis (slide test) by Ag-Ab reactions.
- Ouchterlony double diffusion test, Separation of serum and plasma

References:

1. Talwar, G.P. and Gupta, S.K. (1992). A Hand Book of Practical and Clinical Immunology. CBS Publications, New Delhi.

2. Baren, E.J. (1994). Bailey and Scott's Diagnostic Microbiology, 9th Edition, Mosby Publishers.

3. Dubey, R.C. and Maheswari, D.K. (2002). Practical Microbiology, S. Chand & Co.,

New Delhi.13

4. Samuel, K.M. (Ed.) (1989). Notes on Clinical Lab Techniques, M.K.G. Iyyer & Son Publishers, Chennai.

5. Wadher, B.J. and Reddy, G.L.B. (1995). Manual of Diagnostic Microbiology, Himalaya Publishing House, Mumbai.

6. Dey, N.C., Dey, T.K., Dey, M. and Sinha, D. (1998). Practical Microbiology,

Protozoology, and Parasitology. New Central Book Agency (P) Ltd. Calcutta.

7. Mukherjee, K.L. (1996). Medical Laboratory Technology. Vol II. Tata Mc GrawHill Publishing Co. Ltd., New Delhi.

8. Gopal Reddy, M., Reddy, M.N., Saigopal, DVR and Mallaiah, K.V. (2007). Laboratory Experiments in Microbiology, 2nd edition. Himalaya Publishing House, Mumbai.

(DSC-IF) BSc III year: 6th semester

Title: MEDICAL MICROBIOLOGY

CO 1 INTRODUCTION TO MEDICAL MICROBIOLOGY

Students can learn about basic concepts of medical microbiology such as normal flora, infections, antibacterial substances. Etc.

CO 2 DIAGNOSTIC AND THERAPEUTICAL MICROBIOLOGY

In this section students can learn about general principles of diagnostic microbiology, lab diagnosis methods and chemotherapy concepts.

CO 3 MEDICAL BACTERIOLOGY

Students are made to study in detail about air borne, food and water borne diseases.

CO 4 MEDICAL VIROLOGY AND PARASITOLOGY

Students can learn about some other diseases such as influenza, hepatitis, polio, amoebiases, rabies, malaria, hepatitis, AIDS etc.

Title: MEDICAL MICROBIOLOGY 3HPW-credits-3

UNIT-I: INTRODUCTION TO MEDICAL MICROBIOLOGY

Histroy of medical Microbiology.

Normal flora of human body. Definition of infection.

Non specific defence mechanism- Mechanical barriers.

Antibacterial substance- Lysozyme, Complement, Properdin, Antiviral substances,

Phagocytosis.

Host pathogen interactions. Bacterial toxins, Virulence and Attenuation.

UNIT-II- DIAGNOSTICAND THERAPEUTICAL MICROBIOLOGY

General principles of diagnostic microbiology

Collections, transport & processing of clinical samples.

General methods of lab diagnosis-cultural, biochemical, serological & molecular methods, Test for antimicrobial susceptibility. Elements of chemotherapy-Therapeutic drugs, Mode of action of Pencillin & sulpha drugs & their clinical use. Drug resistance.

Antiviral agents- Interferon, Base analogues.

Preventive control of diseases- active & passive immunization.

UNIT-III MEDICAL BACTERIOLOGY

General account of following diseases, casual organisms, pathogenesis, epidomology, diagnosis, prevention & control; Air born diseases-Tuberculosis.; Food & waterborn diseases- Cholera, Typhoid.; Contact diseases- Syphilis, Gonorrhoea. General account of Nosocomial infections. Zoonotic diseases - Anthrax.

UNIT-IV MEDICAL VIROLOGY AND PARASITOLOGY

General account of following diseases, casual organisms, pathogenesis,epidomology,diagnosis,prevention &control

Air born diseases- Influenza.; Food & waterborn diseases- Hepatitis-A, Poliomyelitis, Amoebiosis.; Insect born diseases-Malaria, Filariasis, Dengue fever.

Zoonotic diseases -Rabies. Blood born diseases- Serum hepatitis, AIDS.

References:

1. Ananthanarayana, R. and Panicker, C.K.S. (2000). Text Book of Microbiology, 6th Edition, Oriental Longman Publications, USA.

2. Gupte, S. (1995). Short Text Book of Medical Microbiology, 8th Edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.

3. Annadurai, B. (2008). A Textbook of Immunology and Immunotechnology. S. Chand & Co. Ltd., New Delhi.

4. Dey, N., T.K. and Sinha, D. (1999). Medical Bacteriology Including Medical Mycology and AIDS. New Central Book Agency (P) Ltd. Calcutta, India.

5. Shetty, N. (1994). Imuunology – Introductory Textbook. New Age International Pvt. Ltd., New Delhi.

6. Singh, R.P. (2007).Immunology and Medical Microbiology. Kalyani Publishers

PRACTICALS Title: MEDICAL MICROBIOLOGY 2 HPW-credits-1

- Biochemical tests for identification members of enterobacteriacea.
- IMVIC test-indole test,methyl red test,voages proskeures test,citrate utilization test. Oxidase test, Catalase test.
- Study of medically important microorganisms-Ecoli, Klebsiella, Staphylococcus,
- Psedomonus, Test for disinfectant (Phenol coefficient)
- Antibiotic sensitivity testing – Disc diffusion method

Slides

- Mycobacterium
- Candida albicans
- Entamoeba histolytica
- plasmodium

References:

1. Ananthanarayana, R. and Panicker, C.K.S. (2000). Text Book of Microbiology, 6th Edition, Oriental Longman Publications, USA.

2. Gupte, S. (1995). Short Text Book of Medical Microbiology, 8th Edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.

3. Annadurai, B. (2008). A Textbook of Immunology and Immunotechnology. S. Chand & Co. Ltd., New Delhi.

4. Dey, N., T.K. and Sinha, D. (1999). Medical Bacteriology Including Medical Mycology and AIDS. New Central Book Agency (P) Ltd. Calcutta, India.

5. Shetty, N. (1994). Imuunology – Introductory Textbook. New Age International Pvt. Ltd., New Delhi.

Code: BS 601, SEC-4 6th semester 2 HPW-credits-2

Title: HOSPITAL WASTE MANAGEMENT

CO 1 · students can learn about types of Hospital waste and its Management. Guidelines of Central Pollution Contreol Board (CPCB), Safe disposal of the Radioactive waste rules.

CO 2 · in this section students are made to learn about Basic steps in health care waste management such as Segregation, Disinfection, Storage and Transportation.

Title: HOSPITAL WASTE MANAGEMENT

Unit-I

- Types of Hospital waste and its Management.
- General , Hazardous , Health care waste, Infectious waste, Genotoxic Waste.
- Specification of Materials and colour coding for Identification.
- Biomedical waste management and handling rules.
- Guidelines of Central Pollution Control Board (CPCB).
- Safe disposal of the Radioactive waste rules.

Unit-II

- Basic steps in health care waste management- Segregation,

Decontamination/Disinfection, Storage and Transportation.

- Mechnical and Chemical Treatment of the Waste.
- Liquid waste treatment-Autoclaving, Incrimination.
- Waste minimization- Recyclinf and reusing.
- Health and safety practices.
- Estimation of various items of waste management.

References:

1. B.D. Acharya, Meeta Singh. Hospital Waste Management and Its Monitoring.

Code: BS 602 GE-2 6th semester

Title: CONTAGIOUS DISEASES AND IMMUNISATION

CO 1 Contagious diseases

Students are made to learn about Types of Infections, their sources, types of infections.

CO 2 Immunization

Students can learn about concepts of Immunity such as types of immunity, and vaccines.

Title: CONTAGIOUS DISEASES AND IMMUNISATION 2 HPW-credits-2

Unit-1: Contagious diseases

Types of Infections,

Sources of infections,

Mode of infections.

Bacterial diseases: Diphtheria, woophing cough, Gonorrhoea,

Viral Diseases: HSV, HIV, HBV.

Unit-2: Immunization

Immunity,

Types of Immunity.

Immunization,

Types of immunization,

Vaccines- Live and killed vaccines,

Vaccination schedule.

References:

1. Ananthanarayana, R. and Panicker, C.K.S. (2000). Text Book of Microbiology, 6th Edition, Oriental Longman Publications, USA.

2. Gupte, S. (1995). Short Text Book of Medical Microbiology, 8th Edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.

3. Annadurai, B. (2008). A Textbook of Immunology and Immunotechnology. S. Chand & Co. Ltd., New Delhi.

4. Dey, N., T.K. and Sinha, D. (1999). Medical Bacteriology Including Medical

Mycology and AIDS. New Central Book Agency (P) Ltd. Calcutta, India.

5. Shetty, N. (1994). Imuunology – Introductory Textbook. New Age International Pvt. Ltd., New Delhi.

6. Singh, R.P. (2007). Immunology and Medical Microbiology. Kalyani Publishers, New Delhi.

Code: BS 606, DSE-1F-A **Title: FOOD MICROBIOLOGY**

2HPW-credits-1 **6th semester**

CO 1

Students can learn about Microorganisms of food materials and their sources. In this section students are made aware of microbes responsible for spoilage of foods.

CO 2

Students can learn about Microbiological production of fermented foods, Biochemical activities of microbes in milk. Microorganisms as food i.e. SCP, Edible mushrooms, Probiotics.

CO 3

Students can learn about Methods of Food preservation, food poisoning and Food intoxication.

CO 4

Students can learn about Microbiology of potable and polluted water, Solid waste disposal and Outline of biodegradtion of environmental pollution –pesticides

Title: FOOD MICROBIOLOGY 3 HPW-credits-3

UNIT-I

Microorganisms of food materials and their sources.

Spoilage of different food materials (Fruits, vegetables, Meat,Fish and Canned foods).

Food born diseases (Salmonellosis & Shigellosis) and their detection.

UNIT-II

Microbiological production of fermented foods- Bread, Cheese,Yoghurt.

Biochemical activities of microbes in milk. Microorganisms as food – SCP, Edible mushrooms

(white button oyster, Paddy straw). Concepts of Probiotics.

Unit-3

Methods of Food preservation:Physical methods - high temperature, low temperature, irradiation, aseptic packaging Chemical methods - salt, sugar, benzoates, citric acid, ethylene oxide, nitrate and nitrite, food poisoning (Staphylococci, C. botulinum)

Food intoxication.

UNIT-4

Microbiology of potable and polluted water

E.coli and streptococcus of water pollution Sanitation of potable water

Sewage treatment (primary,secondary And tertiary)

Solid waste disposal-sanitary landfills & composting

Outline of biodegradation of environmental pollution –pesticides

References:

1. Stanbury, P.F., Whitaker, A. and Hall, S.J. (1997). Principles of Fermentation

Technology, Aditya Books (P) Ltd. New Delhi.

2. Doyle, M.P., Beuchat, L.R. and Montville, T.J. (1997). Food Microbiology:

Fundamentals and Frontiers. ASM Press, Washington D.C., USA.

3. Frazier, W.C. and Westhoff, D.C. (1988). Food Microbiology, Mc Graw-Hill, New York.

4. Jay, J.M. (1996). Modern Food Microbiology, Chapman and Hall, New York.

5. Ray, B. (1996). Fundamentals of Food Microbiology, CRC Press, USA.

6. Rangaswami, G. and Bhagyaraj, D.J. (2001). Agricultural Microbiology, 2nd Edition, Prentice Hall of India, New Delhi.

7. Atlas, R.M. and Bartha, R. (1998). Microbial Ecology - Fundamentals and

Applications, Addison Wesley Longman, Inc., USA

8. Paul, E.A. and Clark, F.E. (1989). Soil Microbiology and Biochemistry, Academic Press, USA.

Title: FOOD MICROBIOLOGY 2HPW-credits-1

Practicals

Title: FOOD MICROBIOLOGY 2HPW-credits-1

- Isolation of microorganisms by crowded plate technique.
- Isolation of Amylase producing organisms.
- Isolation of microorganisms in air by petriplate exposure method.
- Determination of microbiological quality of milk by MBRT method.
- Isolation of fungi & bacteria from spoiled fruits & vegetables.
- Microbiological examination of water by coliform test.
- Determination of biological oxygen demand.
- Spoiled foods-bacterial soft rot, bread& bakery products, milk & milk products, eggs, meat and meat products, canned foods, cheese, yoghurt.
- Bacterial slides- Escherichia coli, Bacillus, Lactobacillus, Azospirillum, Azotobacter, Rhizobium, Yeast, Rhizopus, Penicillium

References:

1. Stanbury, P.F., Whitaker, A. and Hall, S.J. (1997). Principles of Fermentation

Technology, Aditya Books (P) Ltd. New Delhi.

2. Doyle, M.P., Beuchat, L.R. and Montville, T.J. (1997). Food Microbiology:

Fundamentals and Frontiers. ASM Press, Washington D.C., USA.

3. Frazier, W.C. and Westhoff, D.C. (1988). Food Microbiology, Mc Graw-Hill, New York.

4. Jay, J.M. (1996). Modern Food Microbiology, Chapman and Hall, New York. 15

5. Ray, B. (1996). Fundamentals of Food Microbiology, CRC Press, USA.

Government Degree College for Women (Autonomous)

Begumpet, Hyderabad-500016

Affilated to Osmania University, Re-Accredited with'B+' Grade by NAAC

CHOICE BASED CREDIT SYSTEM (CBCS)

DEPARTMENT OF

PHYSICS

(PO`S,CO`S)

SYLLABUS

2016-2020

B.Sc. Physics Year course structure

Paper	Semester	Hours per week	Hours per week		Max Marks		
			Theory	Practical	Theory	Practicals	Credits
B.Sc-I	I,II	6	4	3	100	50	5
B.Sc-II	III,IV	6	4	3	100	50	5
B.Sc-III (2018-20)	V (P5,P6), VI(P7,P8)	6 6	3 3	3 3	100 100	50 50	4 4

Practicals for each 20 students per batch

B.Sc. PHYSICS SYLLABUS UNDER CBCS SCHEME

SCHEME OF INSTRUCTION

Semester	Paper (Theory and Practical)	Instructions Hrs/week	Marks	Credits
I	Paper - 1: Mechanics & Oscillations	4	100	4
	Practicals - 1: Mechanics	3	50	1
II	Paper - II: Waves & Oscillations	4	100	4
	Practicals - II : Waves & Oscillations	3	50	1
III	Paper - III: Thermodynamics	4	100	4
	Practicals - III: Thermodynamics	3	50	1
IV	Paper - IV : Optics	4	100	4
	Practicals - IV: Optics	3	50	1
V	Paper-V: Electromagnetism	3	100	3
	Practicals V: Electromagnetism	3	50	1
	Paper VI : Elective-I Solid state physics / Quantum mechanics and Applications	3	100	3
	Practicals - VI: Elective-I Solid state physics / Quantum mechanics and Applications	3	50	1
VI	Paper -VII: Modern Physics	3	100	3
	Practicals - VII: Modern Physics Lab	3	50	1
	Paper -VIII: Elective-II Basic Electronics/ Physics of Semiconductor Devices	3	100	3
	Practicals VI: Elective-II Practical Basic Electronics/ Physics of Semiconductor Devices	3	50	1

Total credits:36

Programme Outcomes (POs)

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyze the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual.

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1

The graduates of the program will become proficient in the principles and practices of computer science, mathematics, statistics and science, enabling them to solve a wide range of computing related problems.

PSO2

To enable the students with innovative applications of engineering knowledge and programming skills to spearhead the progress of society in the information age.

PSO3

To mould the students into competent, successful, and practicing engineers in their career and/or in pursuing their higher studies through the spirit of innovation and entrepreneurship.

PSO4

To provide exposure to cutting edge technologies, adequate training and opportunities to work individually and as teams on multidisciplinary projects with effective analytical skills.

PSO5

To acquire and practice the profession with ethics, integrity and leadership qualities with due consideration to environmental issues in conformance with societal needs.

SEMESTER I

Course Outcomes:

CO1. Deliberate the characteristics of Mechanics of a system of particles

CO2. Write down in details with application, if applicable, Mechanics of rigid bodies.

CO3. Learn the characteristics of small oscillations of mechanical system

B.Sc. (Physics)-Semester I-Theory syllabus 56 hrs

Paper -I:: Mechanics

(DSC - Compulsory)

(W.E.F the academic year 2016-2017)

(CBCS)

Unit – I

1. Vector Analysis (14)

Scalar and Vector fields, Gradient of a Scalar field and its physical significance.Divergence and Curl of a Vector field and related problems.Vector integration, line, surface and volume integrals.Stokes, Gauss's and Green's theorems simple applications.

Unit - II

2. Mechanics of Particles (07)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter.scattering Cross-section

3. Mechanics of Rigid Bodies (07)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor.Euler's equation, precession of a top, Gyroscope.

Unit-III

4. Central Forces (14)

Central forces - definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws, Coriolis force and its expressions.

UNIT-IV

5. Special theory of Relativity (14)

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation.Concept of four vector formalism.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1. **Berkeley Physics Course.** Vol. I , Mechanics by C. Kittel, W. Knight, M.A. Ruderman - Tata- McGraw hill Company Edition 2008.
2. **Fundamentals of Physics.**Halliday/Resnick/Walker Wiley India Edition 2007.
3. **First Year Physics** - Telugu Academy.
4. **Introduction to Physics for Scientists and Engineers**. F.J. Rucbe. McGraw Hill.

Reference Books

1. **Fundamentals of Physics** by Alan Giambattista et al Tata-McGraw Hill Company Edition,2008.
2. **University Physics** by Young and Freeman, Pearson Education, Edition 2005.
3. Sears and Zemansky' s University Physics by Hugh D. Young, Roger A. Freedman Pearson Education Eleventh Edition .
4. An introduction to Mechanics by Daniel Kleppner& Robert Kolenkow. The McGraw H ill Companies.
5. **Mechanics**. Hans &Puri. TMH Publications .
6. **Engineering Physics.** R .K. Gaur & S.L. Gupta. DhanpatRai Publication s.
7. R P Feymman, RB Lighton and M Sands - The Feymman Lectures in Physics, Vol.- I, BI

Publications,
8. J.C_ Upadhyay - Mechanics.
9. P.K. Srivastava - Mechanics, New Age International.

FIRST SEMISTER PRACTICALS (3 hrs/week) **42hrs**

Practical Paper -I : Mechanics

1. Study of a compound pendulum determination of 'g' and 'k'.
2. Y' by uniform Bending
3. Y by Non-uniform Bending.
4. Moment of Inertia of a fly wheel.
5. Measurement of errors -simple Pendulum.
6.Rigiditymoduli by torsion Pendulum.
7. Determine surface tension of a liquid through capillary rise method.
8. Determination of Surface Tension of a liquid by different methods.
9. Determine Viscosity of a fluid.

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

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Suggested Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

B.SC LABORATORY COURSE OBJECTIVES

- To provide an experimental foundation for the theoretical concepts introduced in the lectures
- To teach how to make careful experimental observations and how to think about draw conclusions from such data
- To help students understand the role of direct observations in physics and to distinguish between interferences based on theory and the outcomes of experiments.
- To introduce the concepts and techniques which have a wide application in experimental science but have not been introduced in the standard courses
- To teach how to write a technical report which communicates scientific information in a clear and concise manner;

• LAB OUT COMES

- By the end of the course students will be able to do the experiments successfully.
- To make careful experimental observations and draw conclusions from such data
- To distinguish between inferences based on theory and the outcomes of experiments
- To write a technical report which communicates scientific information in a clear and concise manner.

SEMESTER II

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of oscillations of a system of particles

CO2. Write down in details with application, if applicable, strings and rods vibrations

CO3. Learn the characteristics of small oscillations of mechanical system

B.Sc. (Physics)Semester II-Theory Syllabus56 hrs **56hrs**

Paper II : - Waves and Oscillations

(W.E.F the academic year 2016-2017)

(CBCS)

Unit - I

1. Fundamentals of vibrations (14)

Simple harmonic oscillator, and solution of the differential equation- Physical characteristics of SHM, torsion pendulum, - measurements of rigidity modulus, compound pendulum, measurement of 'g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures

Unit – II

2. Damped and forced Oscillations (14)

Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy considerations, comparison with undamped harmonic oscillator, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution, amplitude resonance, velocity resonance. Coupled Oscillators.

Unit – III

3. Vibrating Strings (14)

Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverseimpedance

Unit – IV

4. Vibrations of bars (14)

Longitudinal vibrations in bars- wave equation and its general solution. Special cases (1) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar- wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

NOTE : Problems should be solved at the end of every chapter of all units.

Textbooks

1. Fundamentals of Physics. Halliday/Resnick/Walker Wiley India Edition 2007.

2. First Year Physics - Telugu Academy.

3. Introduction to Physics for Scientists and Engineers. F.J. Ruche. McGraw Hill.

4. Fundamentals of Acoustics by Kinsler and Fray, Meer publishers.

Reference Books

1. Fundamentals of Physics by Alan Giambattista et al TMH Company Edition, 2008.

2. University Physics by Young and Freeman, Pearson Education, Edition 2005.

3. An introduction to Mechanics by Daniel Kleppner& Robert Kolenkow. The McGraw Hill Companies.

4. Engineering Physics. R.K. Gaur & S.L. Gupta.DhanpatRai Publications.

SECOND SEMESTER PRACTICALS 42hrs

Practical Paper – II : Waves and Oscillations

1. Study of damping of an oscillating disc in Air and Water logarithmic decrement.
2. Study of Oscillations under Bifilar suspension.
3. Study of oscillations of a mass under different combination of springs.
4. Verification of Laws of a stretched string (Three Laws).
5. Determination of frequency of a Bar-Melde's experiment.
6. Observation of Lissajous figures from CRO.
7. Volume Resonator –determination of frequency of a tuning fork.
8. Velocity of Transverse wave along a stretched string.
9. Study of damping of a bar pendulum
10. Study of coupled oscillator.

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Suggested Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

SEMESTER III

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of Thermodynamic potentials and parameters

CO2. Write down in details with application, if low temperature and radiation pyrometers

CO3. Learn the characteristics of statistical distributions of MB,FD AND BE STATISTICAL system

B.Sc. Semester III-Theory Syllabus **56hrs**

Subject : Physics Paper - III : Thermodynamics

(W.E.F the academic year 2017-2018)

Unit – I

1. **Kinetic theory of gases : (6)**

   Introduction - Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases.

2. **Thermodynamics : (8)**

   Basics of thermodynamics-Kelvin's and Claussius statements – Thermodynamic scale of temperature - Entropy, physical significance - Change in entropy in reversible and irreversible Entropy and disorder - Entropy of universe - Temperature processes Entropy (T-S) diagram - Change of entropy of a perfect gas-change of entropy when ice changes into steam.

Unit - II

3. **Thermodynamic potentials and Maxwell's equations: (7)**

   Thermodynamic potentials - Derivation of Maxwell's thermodynamic relations Clausius-Clayperon's equation - Derivation for ratio of specific heats - Derivation for difference of

two specific heats for perfect gas.Joule Kelvin effect - expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.

4. **Low temperature Physics : (7)**

   Joule Kelvin effect - liquefaction of gas using porous plug experiment. Joule expansion - Distinction between adiabatic and Joule Thomson expansion - Expression for Joule Thomson cooling - Liquefaction of helium, Kapitza's method - Adiabatic demagnetization - Production of low temperatures - Principle of refrigeration, vapour compression type.

Unit - III

5. **Quantum theory of radiation (14)**

   Black body-Ferry's black body – distribution of energy in the spectrum of Black body - Wein's displacement law, Wein's law, Rayleigh-Jean's law - Quantum theory of radiation - Planck's law - deduction of Wein'sdistribution law, Rayleigh-Jeans law, Stefan's law from Planck's law.

Measurement of radiation using pyrometers - Disappearing filament optical pyrometer - experimental determination – Angstrom pyroheliometer - determination of solar constant, effective temperature of sun.

Unit – IV

6. **Statistical Mechanics : (14)**

   Introduction, postulates of statistical mechanics.Phase space, concept of ensembles and some known ensembles ,classical and quantum statistics and their differences, concept of probability, Maxwell-Boltzmann's distribution law -Molecular energies in an ideal gas Maxwell-Boltzmann's velocity distribution law, Bose-Einstein Distribution law, Fermi Dirac Distribution law, comparison of three distribution laws, Application of B-E distribution to Photons-planks radiation formula, Application of Fermi-Dirac statistics to white dwarfs and Neutron stars.

Textbooks

1. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007.Second

2.Year Physics – Telugu Academy.
3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) S. Chand & Co.
4. Heat and Thermodynamics by Mark W.Zemansky 5th edition McGraw – Hill
5. Heat and Thermodynamics by D.S. Mathur.

Reference Books

1. Modern Physics by G. Aruldhas and P. Rajagopal, Eastern Economy Education.
2. Berkeley Physics Course. Volume-5.Statistical Physics by F. Reif.The McGraw-Hill Companies.
3. An Introduction to Thermal Physics by Daniel V. Schroeder.Pearson Education Low Price Edition.
4. Thermodynamics by R.C. Srivastava, Subit K. Saha&Abhay K. Jain Eastern Economy Edition.
5. Modern Engineering Physics by A.S. Vasudeva. S. Chand& Co. Publications.
6. Feyman's Lectures on Physics Vol. 1,2,3& 4. Narosa Publications.
7. Fundamentals of Optics by Jenkins A. Francis and White E. Harvey, McGraw Hill Inc.
8.B.B. Laud "Introduction to statistics Mechanics" (Macmillan 1981)
9. F.Reif : "Statistical Physics" (Mcgraw-Hill, 1998)
10.K.Haung : "Statistical Physics" (Wiley Eastern 1988)

III SEMESTERPracticals **42hrs**

Paper – III : Thermodynamics **(3 hrs/week)**

1. Co-efficient of thermal conductivity of a bad conductor by Lee's method.
2. Measurementof Stefan's constant.
3. Specific heat of a liquid by applying Newton's law of cooling correction.
4. Heating efficiency of electrical kettle with varying voltages.
5. Determination of Thermo emf
6. Cooling Curve of a metallic body (Null method)
7. Resistance thermometer. To Determine temp coeff resistance
8. Thermal expansion of solids
9. Study of mechanical energy to heat. Determine
10. the Specific of a solid (graphite rod)
11. Thermistor Characteristics. Calculation of A and B

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Text and Reference Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

SEMESTER IV

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of GEOMETRICAL OPTICS

CO2. Write down in details with application, in Interference,Diffraction and polarization and optical fibers

CO3. Learn the characteristics of interference, diffraction and polarisation

B.Sc. Semester IV-Theory Syllabus **56hrs**

Subject : (Physics)

Paper - IV : Optics

(W.E.F the academic year 2017-2018)

Unit I

1. **Interference : (14)**

Principle of superposition - coherence - temporal coherence and spatial coherence conditions for Interference of light

Interference by division of wave front : Fresnel's biprism - determination of wave length of light. Determination of thickness of a transparent material using Biprism - change of phase on reflection – Lloyd's mirror experiment.

Interference by division of amplitude : Oblique incidence of a plane wave on a thin film a due to reflected and transmitted light (Cosine law) - Colours of thin films - Non reflecting films – interference by a plane parallel film illuminated by a point source - Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire-Newton's rings in reflected light with and without contact between lens and glass plate, Newton's rings in transmitted light (Haidinger Fringes) - Determination of wave length of monochromatic light - Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light, Difference in wavelength of sodium D1,D2 lines and

thickness of a thin transparent plate.

Unit II :

2. **Diffraction : (14)**

Introduction - Distinction between Fresnel and Fraunhoffer diffraction Fraunhofferdiffraction : - Diffraction due to single slit and circular aperture - Limit of resolution - Fraunhoffer diffraction due to double slit – Fraunhoffer diffraction pattern with N slits (diffraction grating)

Resolving Power of grating - Determination of wave length of light in normal and oblique incidence methods using diffraction grating.

Fresnel diffraction-Fresnel's half period zones - area of the half period zones –zone plate - Comparison of zone plate with convex lens - Phase reversal zone plate - diffraction at a straight edge - difference between interference and diffraction.

Unit III:

3. Polarization (14)

Polarized Ught : Methods of Polarization, Polarization by reflection, refraction, Double refraction , selective absorption , scattering of light - Brewsters law - Malus law - Nicol prism polarizer and analyzer - Refraction of plane wave incident on negative and positive crystals (Huygen 's explanation) - Quarter wave plate, Half wave plate - Babinet's compensator - Optical activity, analysis of light by Laurent's half shade polarimeter.

Unit IV:

4. Aberrations and Fiber Optics :(14)

Introduction - Monochromatic aberrations, spherical aberration, methods of minimizing spherical aberration, coma, astigmatism and curvature of field, distortion. Chromatic aberration - the achromatic doublet - Removal of chromatic aberration of a separated doublet.

Fiber Optics : Introduction - Optical fibers -Principles of fiber communication - Step and graded index fibers -Rays and modes in an optical fiber - Fiber material -Types of optical fibers and advantages of fiber communication.

NOTE: Problems should be solved at the end of every chapter of all units.

Textbooks

1. Optics by AjoyGhatak. The McGraw-Hill companies.
2. Optics by Subramaniyam and Brijlal. S. Chand & Co.
3. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007.
4. Optics and Spectroscopy. R. Murugeshan and Kiruthiga Siva Prasath. S. Chand & Co.
5. Second Year Physics - Telugu Academy.

Reference Books

1. Modern Engineering Physics by A.S. Vasudeva. S.Chand& Co. Publications.
2. Feyman's Lectures on Physics Vol. 1,2,3& 4. Narosa Publications.
3. Fundamentals of Optics by Jenkins A. Francis and White E. Harvey, McGraw H ill Inc.K. Ghatak, Physical Optics'
4. D.P.Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay,1988)
5. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill) 7. Smith and Thomson: 'Optics' (John Wiley and sons)

IV Semester Practicals Paper-IV **42hrs**

Optics

1. Thickness of a wire using wedge method.
2. Determinati on of wavelength of light using Biprism.
3. Determinati on of Radius of curvature of a given convex lens by formingNewton 's rings.
4. Resolving power of grating.
5. Study of optical rotation- polarimeter.
6. Dispersive power of a prism
7. Determination of wavelength of light using diffraction grating minimu m deviation method.
8. Wavelength of light using diffraction grating - normal incidence method.
9. Resolving power of a telescope.
10. Refractive index of a liquid and glass (Boys Method).
11. Pulfrichrefractometer - determination of refractive index of liquid.
12. Wavelength of Laser light using diffraction grating.

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Text and Reference Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint- Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastava

SEMESTER V

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of Electrostatics, magnetostatics and electromagnetism

CO2. Write down in details with application, in Electrostatics, magnetostatics and electromagnetism

CO3. Learn the characteristics of Electrostatics, magnetostatics and electromagnetism

B.Sc. Semester V-Theory Syllabus **42hrs**

Subject : (Physics)Paper-V : Electromagnetism

(DSE- Compulsory)

(W.E.F the academic year 2018-2019)

Unit I :

Electrostatics (11hrs)

Electric Field : - Concept of electric field lines and electric flux, Gauss's law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field E, irrotational field. Electric Potential : - Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field.Calculation of potential from electric field for a spherical Charge distribution.

Unit II :

Magnetostatics(12hrs)

Concept of magnetic field B and magnetic flux, Biot-Savart's law, B due to a straight current a

carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B, solenoidal field. Integral form of Ampere's law, applications of Ampere's law : field due to straight, circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance.Magnetic force between two current carrying conductors.Magnetic field intensity. Ballistic Galvanometer : - Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance.

Unit III :

Induction (9hrs)

Electromagnetic Faraday's laws of induction (differential and integral form), Lenz's law, self and mutual Induction. Continuity equation, modification of Ampere's law, displacement current, Maxwell equations

Unit IV :

Electromagnetic waves (10hrs)

Maxwell's equations in vacuum and dielectric medium, boundary conditions, plane wave equation : transverse nature of EM waves, velocity of light in vacuum and in medium, polarization, reflection and transmission. Polarization of EM waves, Brewster's angle, description of linear, circular and elliptical polarization.

Text Books

1. Fundamentals of electricity and magnetism By Arthur F. Kip (McGraw-Hill, 1968)
2. Electricity and magnetism by J.H.Fewkes& John Yarwood. Vol.I (Oxford Univ. Press, 1991).
3. Introduction to Electrodynamics, 3rd edition, by David J. Griffiths, (Benjamin Cummings, 1998).

Reference Books

4. Electricity and magnetism By Edward M. Purcell (McGraw-Hill Education, 1986)
5. Electricity and magnetism. By DC Tayal (Himalaya Publishing House, 1988)
6. Electromagnetics by Joseph A.Edminister 2nd ed.(New Delhi : Tata McGraw Hill, 2006).

V SEMESTER Practicals Paper - V : Electromagnetism **36hrs**

PHYSICS LABORATORY **Marks : 50**

1. To verifyThevenin Theorem
2. To verify NortonTheorem
3. To verify Superposition Theorem
4. To verify maximum power transfer theorem.
5. To determine a small resistance by Carey Foster's bridge.
6. To determine the (a) current sensitivity, (b) charge sensitivity, and (c) CDR of a B.G.
7. To determine high resistance by leakage method.
8. To determine the ratio of two capacitances by De Sauty's bridge. 9. To determine self-inductance of a coil by Anderson's bridge using AC.
10. To determine self-inductance of a coil by Rayleigh's method.
11. To determine coefficient of Mutual inductance by absolute method. Note : Minimum of eight experiments should be performed.

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Suggested Books for Reference

1. B.L.Worsnop and H.T.Flint- Advanced Practical physics, Asia Publishing House, New Delhi
2. InduPrakash and Ramakrishna, A Textbook of Practical Physics, KithabMahal

SEMESTER V

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of space lattice, XRD SEMICONDUCTORS

CO2. Write down in details with application, in SUPERCONDUCTIVITY AND LASERS

CO3. Learn the characteristics of SEMICONDUCTOR PHYSICS

B.Sc. Semester V-Theory Syllabus **42hrs**

(Physics) Subject : (DSE- Elective-I)

Paper-VI-A - Solid State Physics

Unit-I(11hrs)

Crystal Structure : Solids : Amorphous and Crystalline Materials. Lattice Translation Vectors.Lattice with a Basis - Central and Non-Central Elements.Unit Cell. Miller Indices.Types of Lattices, Reciprocal Lattice.BrillouinZones.Diffraction of X-rays by Crystals.Bragg'sLaw.Atomic and Geometrical Factor. Elementary Lattice Dynamics : Lattice Vibrations and Phonons : Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons.Qualitative Description of the Phonon Spectrum in Solids.Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T3 law

Unit-II(11hrs)

Magnetic Properties of Matter : Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia-and Paramagnetic Domains.Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains.Discussion of B-H Curve.Hysteresis and Energy Loss. Dielectric Properties of Materials : Polarization. Local Electric Field at an

Atom.DepolarizationField.ElectricSusceptibility.Polarizability.ClausiusMosottiEquation.Classical Theory of Electric Polarizability.

Unit-III(10 hrs)

Elementary band theory : Kronig Penny model. Band Gap.Brillouin zones, effective mass of electron. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect,Electric Conductivity by four probe method& Hall coefficient.

UNIT IV(10hrs)

Lasers : Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion.Three-Level and Four-Level Lasers.Ruby Laser and He-Ne Laser.Superconductivity : Experimental Results. Critical Temperature.Critical magnetic field.Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect.Idea of BCS theory.D.C and A.C Josepson effects.

Text Books :

1. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
2. Elementary Solid State Physics, 17e M. Ali Omar, 1999, Pearson India
3. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
4. Solid State Physics - S.O. Pillai (New Age Publication)
5. Modern Physicsby R.Murugesham

Reference Books :

1. Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd. 2. Elements of Solid State Physics, J.P. Srivastava, 2nd Edition, 2006, Prentice-Hall of India 3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D.Mermin, 1976, Cengage Learning
5. Solid State Physics- R.K.Puri&V.K. Babbar (S.Chand Publication 2013
6. Lasers and Non linear Optics-B.B.Laud-Wiley Eastern.
7. LASERS : Fundamentals and Applications - Thyagarajan and Ghatak (McMillanIndia)

V SEMISTER Practicals Paper – VI A **36hrs**

Solid State Physics

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To study the PE Hysteresis loop of a Ferroelectric Crystal.
6. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
7. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150°C) and to determine its band gap.
8. To determine the Hall coefficient of a semiconductor sample.
9. Calculation of d-values of a given Laue's pattern.
10. Calculation of d-values of powder diffraction method.
12. To study the spectral characteristics of a Photo-Voltaic cell.
13. Verification Bragg's of equation.

Reference Books:

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Text Book of Practical Physics, I.Prakash& Ramakrishna, 11th Ed., 2011, KitabMahal
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

SEMESTER VI

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of Plancks theory of radiaton, Photo electric effect, Compton effect

CO2. Write down in details with application, in Modern Physics (SWE,LHO)

CO3. Learn the characteristics of Nuclear physics,radioactive decay and Elementary particles.

B.Sc. Semester VI-Theory Syllabus **42hrs**

Subject : (Physics) (DSC- Compulsory)

Paper-VII-MODERNPHYSICS

UNIT-I (11hrs)

Atomic Spectra and Models Inadequacy of classical physics :

Brief Review of Black body Radiation, Photoelectric effect, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohr's model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld's Modification of Bohr's Theory.

UNIT-II(11hrs)

Wave Particle Duality de Broglie hypothesis, Experimental confirmation of matter wave, Davisson Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets „Gaussian Wave Packet, spatial distribution of wave packet, Localization of wave packet in time. Time development of a wave Packet; Wave Particle Duality, Complementarity.a Heisenberg Uncertainty Principle, Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Time independent and time dependent

Schrodinger wave equation.Estimation of ground state energy of harmonic oscillator and hydrogen atom, non-existence of electron in the nucleus.Uncertainty and Complementarities.

UNIT-III(9hrs)

Nuclear Physics Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model : semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

Unit IV(11hrs)

Radioactivity : stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation : electron-positron pair creation by gamma photons in the vicinity of a nucleus. Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions), Classification of Elementary Particles

Text Books :

1. Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.

2. Modern Physics ---Murugesan and Sivaprasad-(S. Chand Higher Academics)

3. Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill

4. Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.

5. Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Learning. Cengage

6. Quantum Mechanics : Theory & Applications, A.K.Ghatak&S.Lokanathan, 2004, Macmillan

Reference Books

1. Modern Physics - Bernstein, Fishbane and Gasiorowicz (Pearson India) 2010

2. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles -- R. Eisberg (Wiley India) 2012 Additional Books for Reference

3. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.

4. Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.

5. Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co

6. Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub. 7. Six Ideas that Shaped Physics : Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill

8. Modern Physics-Serway (CENGAGE Learnings) 2014

9. Physics of Atoms and Molecules - Bransden (Pearson India) 2003

36hrs VI SEMESTER Practicals **36hrs**

Paper – VII : Modern Physics

1. Measurement of Planck's constant using black body radiation and photo-detector

2. Photo-electric effect : photo current versus intensity and wavelength of light; maximum frequency light photo-electrons of versus energy of

3. To determine the Planck's constant using LEDs of at least 4 different colors.

4. To determine the ionization potential of mercury.

5. To determine the absorption lines in rotational the spectrum of Iodine vapour.

6. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.

7. To setup the Millikan oil drop apparatus and determine the charge of an electron.

8. To show the tunneling effect in tunnel diode using I-V characteristics.

9. To determine the wavelength of laser source using diffraction of single slit.

10. To determine the wavelength of laser source using diffraction of double slits.

11. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating

12. To determine the value of e/m for electron by long solenoid method.

13. Photo Cell – Determination of Planck's constant.

14. To verify the inverse square law of radiation using a photo-electric cell.

15. To find the value of photo electric work function of a material of the cathode using a photo-electric cell.

16. Measurement of magnetic field – Hall probe method.

17. To determine the dead time of a given G.M. tube using double source.

18. Hydrogen spectrum - Determination of Ridge berg's constant

19. Energy gap of intrinsic semi-conductor

20. G. M. Counter - Absorption coefficients of a material.

21. To draw the plateau curve for a Geiger Muller counter.

22. To find the half-life period of a given radioactive substance using a G.M. Counter.

Reference Books

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia House Publishing

2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers

SEMESTER VI

Course Outcomes:

Students who have completed this course should be able to:

CO1. Deliberate the characteristics of NETWORK THEOREMS, SEMICONDUCTOR PHYSICS

CO2. Write down in details with application, in Material sciences

CO3. Learn the Digital electronics using Gates..

B.Sc. Semester VI-Theory Syllabus

42 hrs (Physics) Subject : (DSE- Elective-II) **42hrs**

Paper-VIII-A :BasicElectronics

Unit-I : (10hrs)

Network Elements and Network Theorems

Passive elements, Power sources, Active Elements, Network Models : T and it Transformations, Superposition theorem, Thevenin's Theorem, Norton's theorem. Reciprocity Theorem and Maximum power transfer theorem (Simple problems).

Two-port Networks – Introduction- Z-parameters, Y-parameters, h-parameters and ABCD problems).parameters (Simple

Unit - II : (10hrs)

Band theory of P-N junction

1. Energy band in solids (band theory), valence band, conduction band and forbidden energy gap solids, Insulators, semi conductors and, pure or intrinsic semiconductors and impurity or extrinsic semi-conductors. N-type extrinsic semi-conductors, P-type extrinsic semi conductors, Fermi level, continuity equation.

2. Diodes : P-N junction diode, Bridge rectifier. Zener diode & its Characteristics.Zener diode as voltage regulator.

Unit-III : (11hrs)

1. Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations – transistor as an amplifier -RC coupled amplifier. (Qualitative analysis)

2. Feedback Concept &Oscillators : Feedback, General theory of feedback-Concepts of a Oscillators, Barkhausen's criteria, Phase shift Oscillator.

Unit-IV : (11hrs)

1. Digital Electronics

Binary number system, converting Binary to Decimal and vice versa.Binary addition and subtraction (l's and 2's complement methods).Hexadecimal number system.Conversion from Binary to Hexadecimal – vice versa and Decimal to Hexadecimal vice versa

1. **Logic gates :**

OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND,

NOR as universal gates, Exclusive - OR gate (EX-OR). De Morgan's Laws - Statement and proof.

NOTE : Problems should be solved from every chapter of all units.

Textbooks

1. Electronic devices and circuits - Millman and Halkias. Mc. Graw-Hill Education.
2. Principles of Electronics by V.K. Mehta - S. Chand & Co.
3. Basic Electronics (Solid state) - B. L. Theraja , S. Chand & Co.
4. A First Course in Electronics- Anwar A. Khan&Kanchan K. Dey, PHI.

Reference Books

1. Basic Electronics - BernodGrob.
2. Third year Electronics - Telugu Academy D.P. Leach Applications A.P. Malvino and Principles & –
3. Digital 4. Circuit theory- Umesh.

36hrs VI SEMESTER Practicals **36hrs**

Paper – VIII A : Basic Electronics

1. AND, OR, NOT, gates - Truth table Verification
2. AND, OR, NOT - gates constructions using universal gates - Verification of truth tables.
3. NAND and NOR gates truth table verification
4. Characteristics of a Transistor in CE configuration
5. R.C. coupled amplifier – frequency response.
6. Verification of De Morgan's Theorem.
7. Zener diode V-I characteristics.
8. Verification Thevenin's theorem.
9. Maximum Power Transfer theorem
10. P-n junction diode V- I characteristics.

11. Zenerdiode as a voltage regulator

12. Construction of model a D.C. power supply

13. R C phase shift Oscillator –determination of output frequency

NOTE: Every student should complete minimum 06 experiments.

Text Books for LAB (Practical 6)

1. B.Sc. Practical Physics - C. L. Arora - S. Chand & Co.

2. Viva-voce in Physics - R.C. Gupta, PragathiPrakashan, Meerut. Khandelwal.Course by B.P. Laboratory manual for Physics 3.

4. Practical Physics by M. Arul Thakpathi by Comptex Publishers.

5. B.Sc. practical physics - Subbi Reddy

2019-2020 SYLLABUS

B.Sc. PHYSICS SYLLABUS UNDER CBCS SCHEME

SCHEME OF INSTRUCTION

(Revised and effective from academic year 2019-2022)

Semester	Paper (Theory and Practical)	Instructions Hrs/week	Marks	Credits
I	Paper - 1: Mechanics & Oscillations	4	100	4
	Practicals - 1: Mechanics & Oscillations	3	50	1
II	Paper - II: Thermal Physics	4	100	4
	Practicals - II : Thermal Physics	3	50	1
III	Paper - III: Electromagnetic Theory	4	100	4
	Practicals - III: Electromagnetic Theory	3	50	1
IV	Paper - IV : Waves & Optics	4	100	4
	Practicals - IV: Waves & Optics	3	50	1
V	Paper-V: A. Modern Physics B. Computational Physics	4	100	4
	Practicals - V: A. Modern Physics B. Computational Physics	3	50	1
VI	Paper -VI: A. Electronics B. Applied Optics	4	100	4
	Practicals VI: A. Electronics B. Applied Optics	3	50	1

Total credits:30

Skill Enhancement Courses

1. Experimental methods and Errors analysis
2. Electrical circuits and Networking
3. Basic Instrumentation
4. Biomedical Instrumentation
5. Digital Electronics

Generie Elective:

1. Renewable Energy & Energy Harvesting

Project work/Optional (Nano science)

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc I YEAR (MECHANICS and OSCILLATIONS)CBCS

SEMESTER – I

DSC3311 –MECHANICS and OSCILLATIONS

Applicable from the academic year 2019onwards

MAX MARKS :60 E+40 I=100 **PPW :**5 **NO. Of Credits:**5

.**Objective:** To help students understand the role of direct observations in physics and to distinguish between interferences based on theory and the outcomes of experiments

COURSE OUTCOMES

After completion of the course the student is able to:

1. CO1.Deliberate the characteristics of Mechanics of a system of Particles

2.CO2.Write down in details with application, if applicable, Mechanics of rigid bodies

3.CO3.Learn the characteristics of small oscillations of mechanical system

4.Deliberate the characteristics of oscillations of a system of particles and its applications in rods and strings

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B.Sc. (Physics)-I Year

Semester I

Paper -I:: Mechanics and Oscillations

(DSC - Compulsory)

Unit –I

1. Vector Analysis (10)

Scalar and Vector fields, Gradient of a Scalar field and its physical significance.Divergence and Curl of a Vector field and related problems.Vector integration, line, surface and volume integrals. Stokes, Gauss's and Green's theorems simple applications,

Unit - II

2. Mechanics of Particles (6)

Laws of motion, motion of variable mass system, motion of a rocket, multi-stage rocket, conservation of energy and momentum. Collisions in two and three dimensions, concept of impact parameter.scattering Cross-section

3. Mechanics of Rigid Bodies (6)

Definition of Rigid body, rotational kinematic relations, equation of motion for a rotating body, angular momentum and inertial tensor.Euler's equation, precession of a top, Gyroscope.

Unit-III

4. Central Forces (7)

Central forces - definition and examples, conservative nature of central forces, conservative force as a negative gradient of potential energy, equation of motion under a central force, gravitational potential and gravitational field, motion under inverse square law, derivation of Kepler's laws.

5. Special theory of Relativity (7)

Galilean relativity, absolute frames, Michelson-Morley experiment, Postulates of special theory of relativity. Lorentz transformation, time dilation, length contraction, addition of velocities, mass-energy relation.Concept of four vector formalism.

Unit - IV

6.Oscillations(12)

Simple harmonic oscillator, and solution of the differential equation Physical characteristics of SHM, torsion pendulum measurements of rigidity modulus, compound pendulum, measurement of g', combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies, Lissajous figures

Damped harmonic oscillator, solution of the differential equation of damped oscillator.Energy considerations, logarithmic decrement, relaxation time, quality factor, differential equation of forced oscillator and its solution amplitude resonance, velocity resonance.

Note: *Problems should be solved at the end of every chapter of all units.*

Suggested books

1. B. Keley Physics Course.Vol.1, **Mechanics** by C. Kittel, W. Knight, M.A. Ruderman.*TataMcGraw hill Company* Edition 2008.

2. **Fundamentals of Physics**Halliday/Resnick/Walker *Wiley India Edition 2007.*

3. **First Year Physics -** Telugu Academy

4. **Introduction to Physics for Scientists and Engineers**. FJ.Ruche. McGraw Hill

5. **Scars and Zemansky's University Physics** by Hugh D. Young, Roger A. Freedman Pearson Education Eleventh Edition.

6. **Theory of relativity - Resnick**

7. **Fundamentals of Physics** by Alan Giambattista et al *Tata-McGraw Hill Company* Edition, 2008.

8. **University Physics** by Young and Freeman, *Pearson Education, Edition 2005.*

9. **An introduction to Mechanics** by Daniel Klepper& Robert Kolenkow. *The McGraw Hill Companies.*

10. **Mechanics**. Hans &Puri. TMH Publications,

B.Sc. (Physics) - I year

Semester –I

Paper -1:: Mechanics and Oscillations Practicals

(DSC-Compulsory)

1. Measurement of errors-simple Pendulum.

2. Calculation of slope and intercept of a Y=mX+C graph by theoretical method (simple pendulum experiment)

3. Study of a compound pendulum-determination of 'g' and 'k'.

4. Y' by uniform Bending

5. Y by Non-uniform Bending,

6. Moment of Inertia of a fly wheel

7. Rigidity moduli by torsion Pendulum.

8. Determine surface tension of a liquid through capillary rise method.

9. Determination of Surface Tension of a liquid by any other method.

10. Determine of Viscosity of a fluid

11. Observation of Lissajous figures from CRO-Frequency ratio.Amlitude and phase difference of two waves.

12. Study of oscillations of a mass under different combination of springs-Series and parallel 13. Study of Oscillations under Bifilar suspension Verification of axis theorems

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Suggested Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).

2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).

3. Worsnop and Flint- Advanced Practical physics for students.

4. "Practical Physics" R.K Shukla, AnchalSrivastava

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc I YEAR (THERMAL PHYSICS)CBCS

SEMESTER – II

3311 - THERMAL PHYSICS

Applicable from the academic year 2021 onwards

MAX MARKS :60 E+40I=100**HPW :**5**NO. Of Credits:**5

Objective: To introduce the concepts and techniques which have a wide application in experimental science but have not been introduced in the standard courses

COURSE OUTCOMES

After completion of the course the student is able to:

1. CO1.Deliberate the characteristics of Thermodynamic potentials and parameters

CO2.Write down in details with application, if low temperature and radiation pyrometers

CO3.Learn the characteristics of statistical distributions of MB,FD AND BE STATISTICAL system

CO4.To Learn the Kinetic theory of gases and parameters in Thermodynamics

.

Semester –II

Paper - II: Thermal Physics

(DSC-Compulsory)

Unit-I

1. Kinetic theory of gases: (4)

Introduction - Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena - Viscosity of gases-thermal conductivity-diffusion of gases.

2. Thermodynamics: (8)

Basics of Thermodynamics.Camot's engine (qualitative)-Carnot's theorem -Kelvin's and Clausius statements - Thermodynamic scale of temperature - Entropy, physical significance - Change in entropy in reversible and irreversible processes - Entropy and disorder-Entropy of universe - Temperature. Entropy T-S) diagram - Change of entropy of a perfect gas-change of entropy when ice changes into steam

Unit-II

3. Thermodynamic potentials and Maxwell's equations: (6)

Thermodynamic potentials - Derivation of Maxwell's thermodynamic relations - ClausiusClayperon's equation-Derivation for ratio of specific heats - Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect - expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.

4. Low temperature Physies: (6)

Joule Kelvin effect - liquefaction of gas using porous plug experiment Joule expansion - Distinction between adiabatic and Joule Thomson expansion - Expression for Joule Thomson cooling - Liquefaction of helium, Kapitza's method - Adiabatic demagnetization - Production of low temperatures - Principle of refrigeration, vapour compression type

Unit - III

5. Quantum theory of radiation: (12)

Black body-Ferry's black body - distribution of energy in the spectrum of Black body - Wein's displacement law, Wein's law, Rayleigh-Jean's law - Quantum theory of radiation - Planck's law - deduction of Wein's law, Rayleigh-Jeans law, Stefan's law from Planck's law. Measurement of radiation using pyrometers - Disappearing filament optical pyrometer-experimental determination - Angstrom pyro heliometer - determination of solar constant, effective temperature of sun.

Unit - IV

6. Statistical Mechanics: (12)

Introduction, postulates of statistical mechanics. Phase space, concept of ensembles and some known ensembles classical and quantum statistics and their differences, concept of probability, MaxwellBoltzmann's distribution law Molecular energies in an ideal gas. Maxwell-Boltzmann's velocity distribution law, Bose Einstein Distribution law.Fermi-Dirac Distribution law, comparison of three distribution laws.

NOTE: *Problems should be solved at the end of every chapter of all units.*

Suggested books

1. Fundamentals of Physics. HallidayResnick/Walker.C. Wiley India Edition 2007

2. Second Year Physies -*Telugu Academy*.

3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath (for statistical Mechanics) *S. Chand & Co*.

4. Modern Physics by G. Aruldhas and P. Rajagopal, *Eastern Economy Education*.

5. Berkeley Physics Course. Volume-5.**Statistical Physics** by F. Reif.*The McGraw-HillCompanies.*

6. An Introduction to Thermal Physics by Daniel V. Schroeder. Pearson Education *Low Price Edition*

7. Thermodynamics by R.C. Srivastava. Subit K. Saha&Abhay K. Jain *Eastern Economy Edition*

8. **Modern Engineering Physics** by A.S. Vasudeva. *S. Chand & Co. Publications*

9. B.B Laud **"Introduction to statistics Mechanics"** (Macmillan 1981)

B.Sc. (Physics) - I year

Semester – II

Paper - II:: Thermal Physics Practicals

(DSC - Compulsory)

1. Co-efficient of thermal conductivity of a bad conductor by Lee's method.
2. Measurement of Stefan's constant.
3. Specific heat of a liquid by applying Newton's law of cooling correction
4. Heating efficiency of electrical kettle with varying voltages.
5. Calibration of thermo couple
6. Cooling Curve of a metallic body
7. Resistance thermometer
8. Thermal expansion of solids
9. Study of conversion of mechanical energy to heat.
10. Determine the Specific of a solid graphite rod)

Note: *Minimum of eight experiments should be performed. Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Suggested Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).

2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).

3. Worsnop and Flint. Advanced Practical physics for students.

4. "Practical Physics" R.K Shukla, AnchalSrivastava

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc II YEAR (Electro magnetic theory)CBCS

SEMESTER – III

3311 - Electromagnetic theory

Applicable from the academic year 2021-22 onwards

MAX MARKS :60 E+40I=100**PPW :**5**NO. Of Credits:**5

Objective: To acquire accounting knowledge of Electricity and electromagnetism concepts

COURSE OUTCOMES

After completion of the course the student is able to:

CO1 Deliberate the characteristics of Electrostatics, magnetostatics and Electromagnetism

CO2.Write down in details with application, in Gauss theorems in Electrostatics,Amperes law in magnetostatics and Maxwell`s Electromagnetism

CO3.Learn the characteristics of Electrostatics, magnetostatics and electromagnetism

CO4.Learn the various Network theorems applications for complicated networks/circuits

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Semester – III
Paper-III:: Electromagnetic Theory
(DSC-Compulsory)

Unit 1: Electrostatics (11 hrs)

Electric Field:- Concept of electric field lines and electric flux, Gauss's law (Integral and differential forms), application to linear, plane and spherical charge distributions. Conservative nature of electric field 'E',Irrotational field, Electric potential:- Concept of electric potential, relation between electric potential and electric field, potential energy of a system of charges. Energy density in an electric field.Calculation of potential from electric field for a spherical charge distribution.

Unit II: Magnetostaties (12 hrs)

Concept of magnetic field 'B' and magnetic flux, Biot-Savart's law, B due to a straight current carrying conductor. Force on a point charge in a magnetic field. Properties of B, curl and divergence of B. solenoidal field. Integral form of Ampere's law, Applications of Ampere's law: field due to straight. circular and solenoidal currents. Energy stored in magnetic field. Magnetic energy in terms of current and inductance.Magnetic force between two current carrying conductors.Magnetic field intensity. Ballistic Galvanometer - Torque on a current loop in a uniform magnetic field, working principle of B.G., current and charge sensitivity, electromagnetic damping, critical damping resistance

Unit III: Electromagnetic Induction and Electromagnetic waves (13)

Faraday's laws of induction (differential and integral form), Lenz's law, self and mutual Induction Continuity equation, modification of Ampere's law, displacement current. Maxwell equations Maxwell's equations in vacuum and dielectric medium, boundary conditions, plane wave equation: transverse nature of EM waves, velocity of light in vacuum and in medium. Poynting's theorem.

UNIT IV:

Varying and alternating currents (6)

Growth and decay of currents in LR, CR and LCR circuits - Critical damping. Alternating current, relation between current and voltage in pure R. C and L-vector diagrams - Power in ac circuits. LCR series and parallel resonant circuit - Q-factor. AC & DC motors-single phase, three phase (basics only)

Network Theorems(6):

Passive elements, Power sources, Active elements, Network models: T andπ Transformations, Superposition theorem, Thevenin's theorem, Norton's theorem. Reciprocity theorem and Maximum power transfer theorem (Simple problems).

Text Books

1. Fundamentals of electricity and magnetism By Arthur F. Kip (McGraw-Hill, 1968)
2. Telugu Academy
3. Electricity and magnetism by J.H.Fewkes& John Yarwood. Vol.1 (Oxford Univ. Press, 1991).
4. Introduction to Electrodynamics, 3rd edition, by David J. Griffiths, (Benjamin Cummings,

1998).
5. Electricity and magnetism By Edward M. Purcell (McGraw-Hill Education, 1986)
6. Electricity and magnetism. By DC Tayal (Himalaya Publishing House, 1988)
7. Electromagnetics by Joseph A.Edminister 2nd ed. (New Delhi: Tata McGraw Hill. 2006).

B.Sc. (Physics) - II year

Semester - III Paper -: Electromagnetic Theory Practicals

(DSC - Compulsory)

PHYSICS LABORATORY

1. To verify the Thevenin Theorem
2. To verify Norton Theorem
3. To verify Superposition Theorem
4. To verify maximum power transfer theorem
5. To determine a small resistance by Carey Foster's bridge.
6. To determine the (a) current sensitivity, (b) charge sensitivity, and (c) CDR of a B.G.
7. To determine high resistance by leakage method.
8. To determine the ratio of two capacitances by De Sauty's bridge.
9. To determine self-inductance of a coil by Anderson's bridge using AC.
10. To determine self-inductance of a coil by Rayleigh's method.
11. To determine coefficient of Mutual inductance by absolute method.

Note: Minimum of eight experiments should be performed.

Maximum of 15 students per batch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week.

Suggested Books for Reference:

1. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New Delhi.

2. InduPrakash and Ramakrishna, A Text Book of Practical Physics, KitabMahal

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)
DEPARTMENT OF PHYSICS
B.Sc II YEAR (Waves and Optics)CBCS
SEMESTER – IV
DSC3311 - Waves and Optics
Applicable from the academic year 2021-22 onwards

MAX MARKS : 60 E+40I=100**HPW : 5NO. Of Credits: 5**

Objective: To acquire conceptual and knowledge about waves and optics.

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Deliberate the characteristics of GEOMETRICAL OPTICS

CO2. Write down in details with application, in Interference, Diffraction and polarization and optical fibers

CO3. Learn the characteristics of interference, diffraction and polarization

CO4. Deliberate the characteristics of oscillations of a system of particles

"

Paper - IV:: Waves and Optics
(DSC - Compulsory)

Unit I Waves(12)

Fundamentals of Waves - Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at ends, overtones, energy transport, transverse impedance.

Longitudinal vibrations in bars-wave equation and its general solution. Special cases (i) bar fixed at both ends ii) bar fixed at the mid point iii) bar free at both ends iv) bar fixed at one end. Transverse vibrations in a bar wave equation and its general solution. Boundary conditions, clamped free bar, free-free bar, bar supported at both ends, Tuning fork.

Unit II: Interference: (12)

Principle of superposition - coherence - temporal coherence and spatial coherence - conditions for Interference of light.

Interference by division of wave front: Fresnel's biprism - determination of wave length of light. Determination of thickness of a transparent material using Biprism - change of phase on reflection - Lloyd's mirror experiment.

Interference by division of amplitude: Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) - Colours of thin films - Non-reflecting films - interference by a plane parallel film illuminated by a point source - Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire-

Newton's rings in reflected light with and without contact between lens and glass plate. Newton's rings in transmitted light (Haidinger Fringes) - Determination of wave length of monochromatic light - Michelson Interferometer - types of fringes-Determination of wavelength of monochromatic light. Difference in wavelength of sodium DD, lines and thickness of a thin transparent plate.

Unit III: Diffraction: (12)

Introduction - Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction - Diffraction due to single slit and circular aperture - Limit of resolution - Fraunhofer diffraction due to double slit - Fraunhofer diffraction pattern with N slits (diffraction grating).

Resolving Power of grating - Determination of wave length of light in normal and oblique incidence methods using diffraction grating.

Fresnel diffraction-Fresnel's half period zones - area of the half period zones-zone plate - Comparison of zone plate with convex lens - Phase reversal zone plate-diffraction at a straight edge - difference between interference and diffraction.

Unit IV: Polarization (12)

Polarized light : Methods of Polarization, Polarizatioin by reflection, refraction, Double refraction, selective absorption, scattering of light - Brewster's law - Malus law - Nicol prism polarizer and analyzer - Refraction of plane wave incident on negative and positive crystals (Huygen's explanation) - Quarter wave plate, Half wave plate - Babinet's compensator - Optical activity, analysis of light by Laurent's half shade polarimeter.

NOTE: *Problems should be solved at the end of every chapter of all units.*

Suggested books

1. **Optics** by AjoyGhatak. *The McGraw-Hill companies*.
2. **Optics** by Subramaniyam and Brijlal. *S. Chand & Co*.
3. **Second Year Physics** - *Telugu Academy*
4. **Modern Engineering Physics** by A.S. Vasudeva, *S. Chand & Co. Publications*.
5. **Fundamentals of Optics** by Jenkins A. Francis and White E. Harvey, *McGraw Hill Inc.*
6. K. Ghatak, **Physical Optics'**
7. D.P. Khandelwal, Optical and Atomic Physics' (Himalaya Publishing House, Bombay, 1988)
8. Jenkins and White: 'Fundamental of Optics' (McGraw-Hill)
9. Smith and Thomson: "Optics' (John Wiley and sons).

B.Sc. (Physics) - II year

Semester - IV Paper - IV:: Waves and OptiesPracticals

(DSC-Compulsory)

1. Thickness of a wire using wedge method.
2. Determination of wavelength of light using Biprism.
3. Determination of Radius of curvature of a given convex lens by forming Newton's rings.
4. Resolving power of grating.
5. Study of optical rotation-polarimeter.
6. Dispersive power of a prism
7. Determination of wavelength of light using diffraction grating minimum deviation method.
8. Wavelength of light using diffraction grating-normal incidence method.
9. Resolving power of a telescope
10. Refractive index of a liquid and glass (Boys Method).
11. Pulfrichrefractometer - determination of refractive index of liquid
12. Wavelength of Laser light using diffraction grating.
13. Verification of Laws of a stretched string (Three Laws).
14. Velocity of Transverse wave along a stretched string
15. Determination of frequency of a bar-Melde's experiment

Note: *Minimum of eight experiments should be performed Maximum of 13 students per barch and maximum of three students per experiment should be allotted in the regular practical class of three hours per week*

Suggested Books

1. D.P. Khandelwal, "A laboratory manual for undergraduate classes" (Vani Publishing House, New Delhi).
2. S.P. Singh, "Advanced Practical Physics" (PragatiPrakashan, Meerut).
3. Worsnop and Flint. Advanced Practical physics for students.
4. "Practical Physics" R.K Shukla, AnchalSrivastav

After the completion of the course Student will be familiar with

CO1. Understand in depth The wave function and uncertainty Principle

CO2. Specify in depth Formalism of quantum mechanics

CO3. Understand the details of Schrodinger equation in one dimension

CO4. Deliberate the details of Angular Momentum

CO5. Understand in depth Schrodinger equation in three dimensions

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc III YEAR (PHYSICS)CBCS

SEMESTER – V

GE – RENEWABLE ENERGY RESOURCES

Applicable from the academic year 2021-22 onwards

Objective :To acquire knowledge for application of Renewable Energy Resources for Sustainable developments

Total: 48 hrs

(4 Hrs/week)

Unit I: Principles of Solar Radiation and Collection (Qualitative only): (12 Hrs)

Non-renewable energy resources - Principles of power generation and transmission.A model of conventional thermal power plant.Advantages and disadvantages of conventional power plants. Role and potential of new and renewable sources, the solar energy option, environmental impact of solar power, physics of the sun, the solar constant, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

Unit II: Solar Energy Storage and Applications: (12 Hrs)

Solar energy collectors - Flat plate and concentration collectors, classification of concentration collectors and orientation, advanced collectors. Different sensible, latent heat and stratified storage, solar ponds. Solar Applications - solar heating cooling technique, solar distillation and drying, photovoltaic energy conversion

Unit III: Wind and Bio-Mass Energy: (12 Hrs)

Resources and potentials, horizontal and vertical axis windmills, performance characteristics. Principles of Bio-Conversion, Energy from waste, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking. LPG and CNG.

Unit IV: Geothermal and Ocean Energy (12 Hrs)

Resources, types of wells, methods of harnessing the energy, potential in India.OTEC, principles of utilization, setting of OTEC plants, thermodynamic cycles.Tidal and wave energy, Potential and conversion techniques, mini-hydel power plants, land and their economics.

TEXT BOOKS:

1. Non-Conventional Energy Sources - G.D Rai, Khanna Publishers
2. Renewable Energy ResourcesTwidell&Wier, CRC Press(Taylor & Francis)

REFERENCE BOOKS:

1. Renewable energy resources. Tiwari and Ghosal, Narosa. 2. Renewable Energy Technologies - Ramesh & Kumar, Narosa 3. Non-Conventional Energy Systems - K Mittal, Wheeler 4.Renewable energy sources and emerging technologies by D.P. Kothari, K.C. Singhal.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.COM III YEAR (COMPUTER APPLICATIONS /TAX PROCEDURES/ BUSINESS ANALYTICS)CBCS

SEMESTER – V

DSE 3311 – MODERN PHYSICS

Applicable from the academic year 2021-22 onwards

MAX MARKS :60 E+40I=100**HPW :5NO. Of Credits:5**

Objective: To make the students acquire the knowledge of classical and quantum physics.

COURSE OUTCOMES

After completion of the course the student is able to:

1. Imbibe conceptual knowledge of Classical physics adequacies.
2. Differentiate methods of Classical and quantum physics
3. Apply quantum mechanics to Schrodinger Wave Equation.
4. Demonstrate mastery of solid state physics for matrial science applications.

B.Sc. (Physics)- III Year

Semester -V Paper-V :: (A) Modern Physics

(DSE - Elective)

UNIT I: SPECTROSCOPY (12)

Atomic Spectra: Introduction - Drawbacks of Bohr's atomic model. Sommerfeld's elliptical orbits - relativistic correction (no derivation). Stem &Gerlach experiment. Vector atom model and quantum numbers associated with it. L-S and). coupling schemes. Spectral terms, selection rules, intensity rules - spectra of alkali atoms, doublet fine structure, Zeeman Effect, Paschen-Back Effect and Stark Effect (basic idea).

Molecular Spectroscopy: Types of molecular spectra, pure rotational energies and spectrum of diatomic molecule. Determination of inter nuclear distance. Vibrational energies and spectrum of diatomic molecule. Raman effect, classical theory of Raman effect. Experimental arrangement for Raman effect and its applications.

UNIT -II :Quantum Mechanics (14)

Inadequacy of classical Physics: Spectral radiation - Planck's law (only discussion). Photoelectric effect - Einstien's photoelectric equation.Compton's effect - experimental verification.

Matter waves & Uncertainty principle: de Broglie's hypothesis - wavelength of matter waves, properties of matter waves. Phase and group velocities. Davisson and Germer experiment. Double slit experiment. Standing de Brogile waves of electron in Bohr orbits. Heisenberg's uncertainty principle for position and momentum (x and Px) Energy and time (E and t). Gamma ray microscope. Diffraction by a single slit. Position of electron in a Bohr orbit.Complementary principle of Bohr.

Schrodinger Wave Equation

Schrodinger time independent and time dependent wave equations.Wave function properties - Significance.Basic postulates of quantum mechanics. Operators, eigen functions and eigen values, expectation values

Unit - III: Nuclear Physics (10)

Nuclear Structure: Basic properties of nucleus size, charge, mass, spin, magnetic dipole moment and electric quadrupole moment. Binding energy of nucleus, deuteron binding energy, p-p, n-n, and n-p scattering (concepts), nuclear forces.Nuclear models- liquid drop model, shell model.

Alpha and Beta Decays: Range of alpha particles, Geiger - Nuttal law. Gammow's theory of alpha decay. Geiger - Nuttal law from Gammow's theory, Beta spectrum-neutrino hypothesis

Particle Detectors: GM counter, proportional counter, scintillation counter

UNIT: IV: Solid State Physics &Crystolography (12)

Crystal Structure: Crystalline nature of matter. Cystal lattice Unit Cell, Elements of symmetry.Crystal systems, Bravais lattices.Miller indices. Simple crystal structures (S.C., BCC, FCC, CSCI. NaCl, diamond and Zine Blende)

X-ray Diffraction: Diffraction of X-rays by crystals, Bragg's law, Experimental techniques - Laue's method and powder method.

Bonding in Crystals: Types of bonding in crystals - characteristics of crystals with different bondings.Lattice energy of ionic crystals-determination of Madelung constant for NaCl crystal Calculation of Born Coefficient and repulsive exponent Bom-Haber cycle.

Suggested books

1. Modern Physics by G. Aruldas& P. Rajagopal Eastern Economy Edition
2. Concepts of Modern Physics by Arthur Beiser, Tata McGraw-Hill Edition.
3. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath S. Chand & Co.
4. Nuclear Physics by D.C. Tayal, Himalaya Publishing House
5. Molecular Structure and Spectroscopy by G Aruldhas. Prentice Hall of India, New Delhi.
6. Spectroscopy Atomic and Molecular by Gurdeep R Chatwal and ShyamAnand - Himalaya PublishingHouse.
7. Third Year Physics - Telugu Academy.
8. Elements of Solid State Physics by J.P. Srivastava (for chapter on nanomaterials)- Prentice hall of India Pvt. Ltd.

B.Sc. (Physics Practical) - III year

Semester - V Paper: V:: A. Modern Physics Practicals

(DSE)

1. Measurement of Planck's constant using black body radiation and photo-detector
2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine the Planck's constant using LEDs of at least 4 different colors.
4. To determine the ionization potential of mercury.
5. To determine the absorption lines in the rotational spectrum of lodine vapour.
6. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
7. To setup the Millikan oil drop apparatus and determine the charge of an electron
8. To show the tunneling effect in tunnel diode using 1-V characteristics
9. To determine the wavelength of laser source using difraction of single slit.
10. To determine the wavelength of laser source using diffraction of double slits.
11. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating
12. To determine the value of elm for electron by long solenoid method.
13. Photo Cell - Determination of Planck's constant.
14. To verify the inverse square law of radiation using a photo-electric cell.

15. To find the value of photo electric work function of a material of the cathode using a photo electric cell.

16. Measurement of magnetic field-Hall probe method.

17. To determine the dead time of a given G.M. tube using double source.

18. Hydrogen spectrum - Determination of Rydberg's constant

19. Energy gap of intrinsic semi-conductor

20.G.M. Counter-Absorption coefficients of a material.

21. To draw the plateau curve for a Geiger Muller counter.

22. To find the half-life period of a given radioactive substance using a G.M. Counter

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia PublishingHouse

2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogbom, 4th Edition, reprinted1985. Heinemann Educational Publishers

3. A Text Book of Practical Physics, I. Prakash& Ramakrishna, 11th Edn, 2011.Kitab Mahal

Note: Minimum of eight experiments should be performed

Semester VI

COURSE OUTCOMES

- By the end of the course students understand the concepts of Physics.
- To make careful experimental observations and draw conclusions from such data
- To distinguish between inferences based on theory and the outcomes of experiments
- To write a technical report which communicates scientific information in a clear and concise manner.

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc III YEAR (NANO SCIENCE)CBCS

SEMESTER – VI

PR/PAPER IN LIEU OF PROJECT : RESEARCH METHODOLOGY & PROJECT REPORT /NANO SCIENCE

Applicable from the academic year 2021-22 onwards

MAX MARKS : 60 T + (30R + 10V=40 P) =100 marks
HPW : 2T+4R
NO. Of Credits:4

Objective: To introduce the basics of conducting research in NANOl sciences.

To introduce the basics of conducting research in Physical sciences.

COURSE OUTCOMES
After completion of the course the student is able to:

1.understand some basic concepts of research and its methodologies .
2. identify appropriate research topics.
3. select and define appropriate research problem and parameters.
4. prepare a project proposal (to undertake a project).
5. organize and conduct research (advanced project) in a more appropriate manner.
6. write a research report and thesis.
7. write a research proposal (grants)

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16

(An Autonomous College of Osmania University)

DEPARTMENT OF PHYSICS

B.Sc III YEAR (ELECTRONICS)CBCS

SEMESTER – VI

DSE 3311 - ELECTRONICS

Applicable from the academic year 2021-22 onwards

MAX MARKS :60 E+40I=100**PPW : 5NO. Of Credits: 5**

COURSE OUTCOMES

After completion of the course the student is able to:

1. Understand various BIASING concepts, Junction diodes.
2. Analyse and provide recommendations to improve the operations of Feed back amplifiers, UJT
3. Evaluate the Characteristics of FET,UJT.
4. Differentiate methods of Digital Electronics applications in circuits.

Objective: To be acquaint with Digital -circuit techniques and application methods.

Unit-1: (12 Hrs)

Band theory of P-N junction

1. Energy band in solids (band theory), valence band, conduction band and forbidden energy gap in solids, insulators, semiconductors and pure or intrinsic semiconductors and impure or extrinsic semi-conductors. N-type semi-conductors, P-type semi-conductors.Fermi level, continuity equation.

2. Diodes: P-N junction diode, Half-wave, full-wave and bridge rectifier. Zener diode & its characteristics.Zener diode as voltage regulator.

Unit II: (12 Hrs)

1. Bipolar Junction Transistor (BJT) – p-n-p and n-p-n transistors, current components in transistors, CB, CE and CC configurations - transistor as an amplifier - RC coupled amplifier - Frequency response (Qualitative analysis).

2. Feedback concept & Oscillators: Feedback, General theory of feedback - Concepts of oscillators, Barkhausen's criteria, Phase shift oscillator - Expression for frequency of oscillation.

Unit-III : (10 hrs)

Special devices- Construction and Characteristics: Photo diode - Shockley diode - Solar cell. Optocouplers - Field Effect Transistor (FET) - FET as an Amplifier - Uni Junction Transistor (UT). UT as a relaxation oscillator - Silicon controlled rectifier (SCR) - SCR as a switch.

Unit-IV: (14 Hrs)

1. Digital Electronics

Binary number system, convertion of binary to decimal and vice-versa. Binary addition and subtraction (l's and 2's complement methods).Hexadecimal number system.Conversion from binary to hexadecimal and vice versa.Decimal to hexadecimal and vice versa.

2. Logic gates: OR, AND, NOT gates, truth tables, realization of these gates using discrete components. NAND, NOR as universal gates, Exclusive - OR gate (EX-OR). De Morgan's Laws - Verification.

NOTE: Problems should be solved from every chapter of all units.

Suggested books

1. Electronic devices and circuits - Millman and Halkias. *McGraw-Hill Education*
2. Principles of Electronics by V.K. Mehta - *S. Chand & Co*.
3. Basic Electronics (Solid state) - B. L. Theraja. S. Chand & Co.
4. A First Course in Electronics- Anwar A. Khan &Kanchan K. Dey, PHI
5. Physics of Semiconductor Devices S. M. Sze
6. Physics of Semiconductors. Streetman
7. Basic Electronics - BernodGrob.
8. Third year Electronics - Telugu Academy
9. Digital Principles & Applications - A.P. Malvino and D.P. Leach

B.Sc. (Physics Practical) - III year

Semester - VI

Paper: VI::A. Electronics

1. Construction of logic gates (AND, OR NOT, gates) with discrete components – Truth table Verification

2. AND, OR, NOT-gates constructions using universal gates - Verification of truth tables.

3. Construction of NAND and NOR gates with discrete components and truth table

Verification

4. Characteristics of a Transistor in CE configuration

5. R.C. coupled amplifier-frequency response.

6. Verification of De Morgan's Theorem.

7. Zener diode V.1 characteristics.

8. P-n junction diode V. I characteristics

9. Zener diode as a voltage regulator

10. Construction of a model D.C. power supply

11. RC phase shift Oscillator-determination of output frequency

- ❖ Every student should complete minimum 06 experiments.

Suggested Books

1.B.Sc. Practical Physics-C. L. Arora - S. Chand & Co.
2. Viva-voce in Physics - R.C. Gupta, PragathiPrakashan, Meerut.
3. Laboratory manual for Physics Course by B.P. Khandelwal.
4. Practical Physics by M. Arul Thakpathi by Comptex Publishers.
5. B.Sc. practical physics - Subbi Reddy

Note: Minimum of eight experiments should be performed.

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PHYSICS COURSE OBJECTIVES

- To provide an experimental foundation for the theoretical concepts introduced in the lectures
- To teach how to make careful experimental observations and how to think about draw conclusions from such data
- To help students understand the role of direct observations in physics and to distinguish between interferences based on theory and the outcomes of experiments.
- To introduce the concepts and techniques which have a wide application in experimental science but have not been introduced in the standard courses
- To teach how to write a technical report which communicates scientific information in a clear and concise manner

GOVERNMENT DEGREE COLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERABAD

Re-Accredited with 'B^{+}' Grade by NAAC

BOARD OF STUDIES IN POLITICAL SCIENCE

For

B A POLITICAL SCIENCE

UNDER GRADUATE PROGRAMME

IN

CHOICE BASED CREDIT SYSTEM

(w.e.f. 2019-2020 Onwards)

Faculty of Social Sciences

GDCW (A), Begumpet, Hyderabad

Scheme for CBCS in BA Political Science - 2020-21

Course	**Name of the Module**	No. of Credits
	Semester-I	
DSC 1	Understanding the Political Theory	5
	Semester-II	
DSC 2	Western Political Thought	5
	Semester-III	
DSC 3	Indian Political Thought	5
SEC	Disaster Management	2
	Semester-IV	
DSC 4	Constitution and Politics of India	5
SEC	Legal Literacy	2
	Semester-V	
DSE 1	Paper V: Western Political Thought	4
DSE 2	Paper VI: International Relations	4
GE	Human Rights	2
	Semester- VI	
DSE 3	Paper VII: Indian Political Thought	4
DSE 4	Paper VIII: Contemporary International Relations	4
GE	Gender and Environment	2

Programme Outcomes

After completing the graduation in BA Political Science the students are able to:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes :

- Exerts it's Influence on life and destiny of human beings
- Act as a stepping stone for one's success in competitive examinations
- Create appropriate and efficient Historians, Political Leaders, administrators and State'sman
- Educate about patriotism toleration and National Integration

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE

Semester I Syllabus
Paper – I
Module: Understanding Political Theory

Course Outcome:
On completion of the Course, students will:

- Learn in depth meaning and nature of political theory
- Deliberate in details with examples differences between politics and political theory
- Understand the elements of state and origin theories of the states, and political concepts.
- Specify the details of theoretical perspectives of liberal, Marxist and feminist.
- Understand the political ideologies.
- Understanding the making of the public policies, role of the media and importance of the public opinion.

Unit- I: Political Theory

1. What is Political Theory, Evolution, Nature, Significance
2. Debates on Political Theory

a) Normative b) Empirical

Unit-II

1. State: Theories of origin of the state, Divine, Social Contract, Evolution Theories

a. Power and Authority

b. Sovereign state: Challenges

Unit- III

1. Political Values and Theoretical Perspective

Liberty :- A) Liberal B) Marxist C) Feminist

Equality :- A) Liberal B) Marxist C) Feminist

Justice :- A) Liberal B) Marxist C) Feminist

Unit-IV Political Ideologies

a) Liberalism
b) Socialism
c) Multiculturalism

Unit-V: Public Policy And Mass Media

a) Public Policy : Meaning, Nature, Scope and Significance
b) Mass Media : Agents of public Opinion

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE
PAPER-II, II-SEMESTER,
MODULE: WESTERN POLITICAL THOUGHT

Course outcomes:

On completion of the Course, students will:

- Understand in details of the greek political philosophy.
- Identify the classification and characteristics of western political thought
- Understand in details with examples western political thought
- Understand in depth of different political thinkers ideologies.
- Identify the classification and characteristics of liberalistic ideologies.
- Learn the details of Marxism and hegemony theory.

UNIT I: INTRODUCTION AND ANCIENT POLITICAL THOUGHT

1. Political Thought : Nature , Significance.
2. Plato: Theory of Justice and Ideal State.
3. Aristotle: Classification of Governments , Slavery and Theory of Revolutions.

UNIT-II: MEDIEVAL AND EARLY MODERN POLITICAL THOUGHT

1. Saint Thomas Acquinas : Views on Church- State, Slavery, Classification of governments and Theory of Law.
2. Church- State controversy.
3. Nicolo Machiavelli: Views on Human Nature, Religion, State Craft and suggestions to the Prince.

UNIT-III: SOCIAL CONTRACTUALISTS

1. Thomas Hobbes: Views on Human Nature, State of Nature, Social Contract Theory, Individualism and Absolute Sovereignty
2. John Lock: State of Nature, Human Nature and Social contract, Natural Rights and Limited Government.
3. Jean Jacquies Rousseau: State of Nature, Human Nature , Social Contract, General Will and Popular Sovereignty.

UNIT-IV: UTILITARIANS

1. Jeremy Bentham: Principles of Utilitarianism.
2. J.S.Mill: Views on Bentham's Utilitarianism, Liberty,

Representative Government and Women's Liberty.

UNIT-IV: MARXIST THINKERS

1. Karl Marx: Dialectical Materialism, Historical Materialism, Class Struggle, Surplus Value and communism.
2. Antonio Gramsci: Hegemony and Civil Society.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH B^+ GRADE BY NAAC
PAPER-III, SEMESTER-III,

MODULE: INDIAN POLITICAL THOUGHT

Course outcomes:

On completion of the Course, students will:

- Understand in details with application, if applicable, Indian political thought
- Specify in depth Indian political thought
- Identify the classification and characteristics of Indian political thought
- Understand in details with examples Indian political thought
- Understand in depth of Gandian and Ambedkar Ideologies.
- Learn the details of Socialistic society and socialistic democracy methods.

Unit- I

State and Society in Ancient India

Manu – Features of Manusmriti, Origins of Varna, Varna Dharma

Buddha – Dhamma , Sangha , Eightfold path

Kautilya- Saptanga Theory , Mandala Theory , Statecraft

Unit-II

Medieval Political Thought

Basava- Anubhava Mantapa , Gender Equality

Ziauddin Barani- Theory of Kingship Ideal Sulth, Ideal Polity

Unit- III **RenaissanceThought**

Raja Ram Mohan Roy - Colonial Encounters , Brahma Samaj
Dayananda saraswathi- Arya Samaj

Jyothi Rao Phule- Gulam Giri , Satya Shodhak Samaj, Educat

Unit-IV **Reformist Thought**

M. K. Gandhi – Satyagraha , Trusteeship , Problem of Political Obligation
Dr. B. R. Ambedkar- Who are Shudras? , Annihilation of Caste

Unit-V **Socialist Thought**

Jawaharlal Nehru- Democratic Socialism
Jayaprakash narayan – socialist movement.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH B^+ GRADE BY NAAC
BA II YEAR
SEMESTER-IV
PAPER-IV,
MODULE: Constitution and Politics of India

Course Outcome:
On completion of the Course, students will:

- Identify the characteristics of Indian politics
- Understand the characteristics of Indian constitution
- Understand in details with application, if applicable, federalism
- Identify the classification and characteristics of power structure in India
- Identify the details of party system in India

Unit- I **Constitutional Development in India**

- Brief overview of Nationalist Movement
- Evolution of Indian Constitution -1909 Act ,1919 Act ,1935Act.
  Philosophical Foundations of the Indian Constitution – Liberal, Gandhian Socialist

Unit- II : **Institutional Framework**

- Union Government – Executive; Legislature; Judiciary
  State Government - Executive; Legislature; Judiciary

Unit- III **Federal Politics**

- Union- State Relations : Legislative, Administrative, Financial
  Recent trends in Union - State Relations

Unit- IV**: Electoral Politics in India**

- Political Parties a) National : INC, BJP, CPM, BSP

b) Regional : DMK, Akali Dal, TDP, TRS

c) Recent Trends in Party System
Election Commission & Electoral Reforms

Unit- V : **Issues in Indian Politics**

- Debates on Secularism – Majority Communalism, Minority Communalism
- Caste in Politics and Politicization of caste
- Gender in Indian Politics
- Issues of Minorities – Sachar Committee

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE
PAPER-V, V-SEMESTER,
MODULE: WESTERN POLITICAL THOUGHT

Course outcomes:

On completion of the Course, students will:

- Understand in details of the greek political philosophy.
- Identify the classification and characteristics of western political thought
- Understand in details with examples western political thought
- Understand in depth of different political thinkers ideologies.
- Identify the classification and characteristics of liberalistic ideologies.
- Learn the details of Marxism and hegemony theory.

UNITI: INTRODUTION AND ANCIENT POLITICAL THOUGHT

1.Political Thought : Nature , Methods and significance.
2.Plato: Theory of Justice and Ideal State.
3. Aristotle: Classification of Governments , Slavery and Theory of Revolutions.

UNIT-II: MEDIEVAL AND EARLY MODERN POLITICAL THOUGHT

1.Saint Thomas Acquinas : Views on Church- State, Slavery, Classification of governments and Theory of Law.
2. Church- State controversy.
3.Nicolo Machiavelli: Views on Human Nature, Religion,State Craft and suggestions to the Prince.

UNIT-III: SOCIAL CONTRACTUALISTS

1.Thomas Hobbes: Views on Human Nature, State of Nature, Social Contract Theory, Individualism and Absolute Sovereignty.
2.John Lock: State of Nature, Human Nature and Social contract,Natural Rights and Limited Government.
3 . Jean Jacquies Rousseau: State of Nature, Human Nature , Social Contract, General Will and Popular Sovereignty.

UNIT-IV: UTILITARIANS

1. Jeremy Bentham: Principles of Utilitarianism.
2.J.S.Mill: Views on Bentham's Utilitarianism, Liberty, Representative Government and Women's Liberty.

UNIT V: MARXIST THINKERS

1.Karl Marx: Dialectical Materialism, Historical Materialism,Class Struggle, Surplus Value and communism.
2. Antonio Gramsci: Hegemony and Civil Society.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE
PAPER-VI,
V-SEMESTER
MODULE: INTERNATIONAL RELATIONS-I

Course Outcome:

On completion of the Course, students will:

- Identify the classification and characteristics of approaches of international relations
- Understanding the causes and consequences of the I and II world wars.

- Specify the classification and characteristics of cold war
- Write down in depth of globalization and international funding agencies.
- Understand the political concepts of international relations like power authority, sovereignty and balance of power.

UNIT-I: INTRODUCTION TO INTERNATIONAL RELATIONS

1. Introduction to International Relations: Evolution, Meaning, Definition, Nature, Scope and Significance.
2. Rise of Sovereign state system: Origin and Development of the Modern state system , Further growth of change in the state system, Main features of the nation-state system and factors responsible for the decline of state system.

UNIT-II: HISTORY OF INTERNATIONAL RELATONS

1. Colonialism: Rise of colonialism, Causes for the rise of colonialism, Phases and impact of colonialism.
2. The First World War: Nature ,causes and its impact on International Relations. Second World War, Nature , Causes and Consequences.

UNIT- III: POST WAR DEVELOPMENTS

1. Decolonisation: Causes of decolonization and its Impact. Emergence of Third world , Problems and Prospects.
2. Cold war: Definition , Causes, Phases and Impact.

UNIT-IV : CONCEPTS IN INTERNATIONAL RELATIONS

1. National power: Meaning , Definition and Elements. Super Power, Regional power,
2. Détente – Bipolarity-Unipolarity and Multipolarity, Peace and Security.

UNIT-V: INTERNATIONAL POLITICAL ECONOMY

1. Neo-colonialism: North-South Dialogue, South-South Cooperation.
2. IBRD, IMF, WTO and Globalisation .

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE
PAPER-VII, VI-SEMESTER, SYLLABUS-2020-21
MODULE: INDIAN POLITICAL THOUGHT

Course outcomes:

On completion of the Course, students will:

- Understand in details with application, if applicable, Indian political thought
- Specify in depth Indian political thought

- Identify the classification and characteristics of Indian political thought
- Understand in details with examples Indian political thought
- Understand in depth of Gandian and Ambedkar Ideologies.
- Learn the details of Socialistic society and socialistic democracy methods.

UNIT-I: INTRODUCTION AND ANCIENT POLITICAL THOUHT

1. Sources, Concepts and Ancient Political Thought, Western and Indian Political Thought comparison
2. Main sources and concepts of Indian Political Thought. Manu: Manusmruthi, Origin of the state, Varna Dharma, State and Society.

UNIT-II: ANCIENT AND MEDIEVALPOLITICAL THOUGHT

1. Kautilya: Arthasastra, Saptanga Theory, State Craft and Mandala Theory.
2. Gauthama Buddha: Dhamma and Sangha, Social and Political Ideas, Nature of the State, Powers and Functions.

UNIT-III: EGALITARIAN THINKERS

1. Jyothirao Phule: Critique of Brahmanism and Social revolution.
2. B.R.Ambedkar: Theory of Caste, Anhilation of Caste and State Socialism.

UNIT-IV: UNIVERSAL POLITICAL THINKERS15Hrs

1. Swami Vivekananda: Social and Political Ideas . Ideal Society
2. Rabindranah Tagore: Critique of Nationalsim

UNIT-V: NATIONALIST POLITICAL THINKERS

1. Mohandas Karamchand Gandhi : Ahimsa, Satyagraha, Philosophical Anarchism, Theory of Trusteeship, Views on Economy and Gramaswaraj.
2. Jawaharlal Nehru: Nationalism, Secularism and Economic, Social and political Democracy, Internationalism, Non-Alignment and panchasheel.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH "B" GRADE BY NAAC
POLITICAL SCIENCE
PAPER-VIII, VI-SEMESTER,
MODULE: CONTEMPORARY INTERNATIONAL RELATIONS-II

Course Outcomes:

On completion of the Course, students will:

- Understanding the international organizations and regional organizations.
- Comprehend the details of international security methods, nuclear weapons etc.

- Write down the characteristics of India's foreign policy
- Specify in depth India and her neighbours relationship
- Learn the details of relations of India with great powers
- Examine the international social issues such as terrorism, Environmental movements etc.

UNIT-I: INTERNATIONAL AND REGIONAL ORGANISATIONS

1. United Nations Organisation: Objectives ,Structure, Achievements and Challenges , Need for reforms and Restructuring and Reforming of the UNO.
2. Regionalisation of world politics: European Union, ASEAN, and BRICS

UNIT-II: INTERNATIONAL SECURITY

1. Arms race, Arms Control and Disarmament : History of Arms control and disarmament and Agreements
2. Issues in Nuclear politics: NPT - India's Nuclear Policy

UNIT-III: FOREIGN POLICY

1. Foreign policy Determinants , Features of India's Foreign policy, Non-Alignment and its relevance.
2. Indias relation with Major powers USA, Russia

UNIT-IV: INDIA AND SOUTH ASIA

1. SAARC. India's Look East Policy.
2. Impediments to regional co-operation: River water disputes; Illegal cross-border migration; ethnic conflicts and insurgencies border disputes.

UNIT-V: EMERGING AREAS IN INTERNATIONAL RELATIONS

1. Environment: Issues and Challenges. Multiculturalism
2. Terrorism: Causes, Types, Methods of terrorists and measures to Combat.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD-
RE-ACCREDITED WITH B $^{+}$ GRADE BY NAAC
SKILL ENHANCEMENT COURCE
YEAR-II,
SEMESTER-III
MODULE: DISASTER MANAGEMENT

Course outcomes:

- Understand the concepts of risk, hazard and disaster etc.
- To learn about the framework of risk management.
- To understand the vulnerability and rehabilitation methods.
- To study the frame work of NMDA and SMDA.

UNIT-I

Introduction to Natural disasters – Meaning and Nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches.
Introduction to Man Made Disasters – Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire and oil fire.

UNIT-II

Disaster Risk Management in India. Hazard and Vulnerability profile of India. Components of Disaster Relief; water; food; sanitation, shelter.

Mitigation response and preparedness. Disaster management Act Policy, programmes and legislation. National Disaster Response Force (NDRF) . Role of NGO's, community based organization and media. Centre, State, District and local administration**.**

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH B $^{+}$ GRADE BY NAAC
SKILL ENHANCEMENT COURCE
YEAR-II, SEMESTER-IV
MODULE: LEGAL LITERACY

Course Outcome:

On completion of the Course, students will:

- Identify in depth democratic awareness with legal literacy
- Learn in details with examples system of course

- Write down in details with application, if applicable, constitutional rights and there enforcement
- Understand in details with examples criminal jurisdiction
- Specify in details with examples personal laws in India

Unit - I

1. Introduction: Judiciary – Significance and functions.
2. Sources of Law , Concept of Rule of Law and Judicial Review.
3. Judicial System in India – Supreme Court, High Court and District Courts.
4. Constitutional Protections of Rights: Writs- Habeas Corpus, Mandamus, Certiorari, Prohibition and Quo-warranto.
5. Arbitration, Tribunal Adjudication and Alternate Dispute Resolution – Administrative Tribunals, Ombudsman, Mediation, Conciliation, Lok Adalats, Lokpal and Lokayukta.
6. Right to information Act – 2005

Unit – II

1. Legal Terminology: Appeals, Alimony, Backlog, Bail, Bench, Contempt of Court, Immunity, Indian Penal Code, Civil Procedure Code, Criminal Procedure Code, Juvenile Court, Power of Attorney, Petition, Plaint, Suit, Status Quo, Summons.
2. First Information Report (FIR) – Procedure and Importance.
3. Public Interest Litigation (PIL)
4. Rights of Senior Citizens, Disabled, Tribal's and Depressed Classes.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH B $^{+}$ GRADE BY NAAC
GENERIC ELECTIVE
SEMESTER-V, MODULE: HUMAN RIGHTS
SYLLABUS-2020-21
B.A Political Science

Human Rights

Course outcomes:

- To understand the issues concerning the rights of citizens in general and the marginalized groups in particular.

- To assess the institutional and policy measures which have been taken in response to the demands of various movements.
- Understand the Conceptual dimensions, international trends and the Indian experience form the contents of the course.

MODULE-I: Understanding Social Inequality

Caste, Gender, Ethnicity and Class as distinct categories and their interconnection. Globalisation and its impact on workers, peasants, dalits, adivasis and women.

MODULE-II: Human Rights

Human Rights: Various Meanings UN Declarations and Covenants Human Rights and Citizenship Rights Human Rights and the Indian Constitution Human Rights, Laws and Institutions in India; the role of the National Human Rights Commission. Human Rights of Marginalized Groups: Dalits, Adivasis, Women, Minorities and Unorganized Workers. Consumer Rights: The Consumer Protection Act and grievance redressal mechanisms. Human Rights Movement in India.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERABAD
RE-ACCREDITED WITH B $^{+}$ GRADE BY NAAC
GENERIC ELECTIVE
SEMESTER-VI, MODULE: Gender and Environment
SYLLABUS-2020-21
B.A Political Science

Gender and Environment

Course outcomes: This course aims at enabling the students

- to understand the issues concerning the rights of citizens in general and the marginalized groups in particular.
- To assess the institutional and policy measures which have been taken in response to the demands of various movements and Conceptual dimensions.
- To comprehend the international trends and the Indian experience form the contents of the course.

MODULE-III: Gender

Analysing Structures of Patriarchy Gender, Culture and History Economic Development and The issue of Women's Political Participation and Representation in India Laws, Institutions and Women's Rights in India Women's Movements in India

MODULE-IV: Environment

Environmental and Sustainable Development UN Environment Programme: Rio, Johannesburg and after. Issues of Industrial Pollution, Global Warming and threats to Bio – diversity Environment Policy in India Environmental Movement in India

GOVERNMENT DEGREE COLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERABAD

Re-Accredited with 'B^{+}' Grade by NAAC

CHOICE BASED CREDIT SYSTEM

(CBCS)

BOARD OF STUDIES IN PUBLIC ADMINISTRATION

For

B A PUBLIC ADMINISTRATION I ,II & III YEARS

UNDER GRADUATE PROGRAMME

IN

DEPARTMENT OF PUBLIC ADMINISTRATION

(w.e.f. 2019-20 onwards)

PROFORMA OF INSTRUCTIONS AND EXAMINATIONS

PROGRAMME: BA in Public Administration

Sl.No	*Code*	*Course Title*	*HP W*	*Credit s*	*Exam Hrs*	*Marks*
I Yr		**SEMESTER – I**				
	DSC103	Basics of Public Administration	5	5	3 hrs	60+40
		SEMESTER – II				
	DSC203	Development Dynamics and Emerging Trends	5	5	3 hrs	60+40
II Yr		**SEMESTER – III**				
	SEC1	Public Office Administration	2	2	1 ½ hrs	40U+10 I
	SEC2	Office Processes	2	2	1 ½ hrs	40U+10 I
	DSC303	Union Administration	5	5	3 hrs	60+40
		SEMESTER – IV				
	SEC3	Technology & Office Administration	2	2	1 ½ hrs	40U+10 I
	SEC4	Techniques of Office Administration	2	2	1 ½ hrs	40U+10 I
	DSC403	State Administration	5	5	3 hrs	60+40
III Yr		**SEMESTER – V**				
	GE	Indian Constitution & Administration	2	2	3 hrs	40U+10 I
	DSC 503	a) Human Resource Management/ b) Rural Governance	**5** 5	**5** 5	3 hrs 3 Hrs	75+25 75+25
		SEMESTER – VI				
	GE	Good Governance	**2**	**2**	**1 ½ Hrs**	**40+10**
	DSC 603	a) Financial and Materials management b) Urban governance	**5** **5**	**5** **5**	3 hrs 3 Hrs	75+25 75+25
			52	**52**		800
	Project work by students.			**2**		50

Programme Outcomes:

After completing the graduation in BA Public Administration as optional subject the students are able to:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific outcomes:

- To understand the nature and role of Public Administration in the changing socio-economic and political context
- Understand the impact of political dynamics on administrative processes;
- Relate the role of public administration to the dynamics of global context;
- Motivate the students to appear for civil services and state services examinations.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD
(Re-accredited by NAAC with "B" Grade)
B. A I year, Revised Semester wise Syllabus (w. e. f. 2019-20)
Subject: Public Administration

Course outcomes:

After study of this Course, the learner should be able to:

- To understand the nature and scope of Public Administration;
- To appreciate the methodological pluralism and synthesizing nature of knowledge in Public Administration;
- To comprehend the changing paradigms of Public Administration;
- To acquaint with the theories, approaches, concepts and principles of Public

Administration;

- To understand the administrative theories and concepts to make sense of administrative practices.
- To understand the role of public services in the emergence and development of Telangana state

Semester – I
Paper - I: **BASICS OF PUBLIC ADMINISTRATION**

Unit- I: Nature of Public Administration

1. Meaning and Importance of Public Administration
2. State and Evolution of Public Administration

Unit-II: Relationship with other Social Sciences

3. Law
4. Political Science
5. Economics
6. Psychology

Unit-III: Oriental and Classical Approaches

7. Oriental Approach –Kautilya
8. Classical Approach: Henri Fayol, Luther Gulick and Lyndall Urwick
9. Scientific Management Approach: F.W.Taylor
10. Bureaucratic Approach: Max Weber and Karl Marx

Unit-IV: Human Relations and Behavioural Approaches

11. Human Relations Approach –Elton Mayo
12. Behavioural Approach: Herbert A. Simon
13. Socio- Psychological Approach: Abraham Maslow; Mc Gregor

Unit-V: Ecological and Social Justice Approaches

14. Administrative Ecology: F.W.Riggs
15. Social Justice Approach –B.R.Ambedkar
16. Jyothirao Pule

References

Avasthi & Maheshwari (2012) Public Administration, Lakshminarayana Agarwal, Agra.

Arndt Christian and Charles Oman (2006) Uses and Abuses of Governance Indicators, OECD, Paris. Bhattacharya, Mohit (2013), New Horizons of Public Administration, Jawahar Publishers, New Delhi.

Donald Menzel and Harvey White (eds) (2011) The State of Public Administration: Issues, Challenges and Opportunities, New York, M.E. Sharpe.

Henry, Nicholas (2006) Public Administration and Public Affairs, Prentice Hall of India, New Delhi. Jan – Erik Lane (2000) New Public Management: An Introduction, Routledge, London.

Ravindra Prasad, D. Prasad, VS Prasad, Satyanarayana, P., and Y. Pardhasaradhi (eds) (2013) Administrative Thinkers, Sterling, New Delhi. Frank J. Goodnow, Politics and Administration: A Study in Government, Transaction Publishers, New York, 2003.

O'Leary, Rosemary et al (2010) The Future of Public Administration around the World: The Minnowbrook Perspective, GeorgeTown University Press, D.C.

Martin Albrow (1970) Bureaucracy, MacMillan, London.

UN, Department of Economic and Social Affairs, Development Administration: Current Approaches and Trends in Public Administration for Development, New York, UN, 1975.

Wilson Woodrow, 'The Study of Administration' Political Science Quarterly 2 (June 1987). Telugu Akademi, BA. Ist Year Public Administration.

Semester-II

Paper II (DSC 203): Development Dynamics and Emerging Trends

Course outcome:

After study of this Course, the learner should be able to:

- To understand the comparative studies and changing dynamics of development Administration;
- To comprehend the new public administration concepts and processes in Public Administration;
- To comprehend the changing paradigms of new Public Administration;
- To acquaint with the market theories, approaches, concepts and principles of Public choice theory;
- To understand the administrative theories and concepts to make sense of administrative management practices.
- To understand the impact of globalization on Indian administration

Unit- I: Comparative & Development Administration

1. Comparative Administration
2. Development Administration
3. Changing Dynamics of Development Administration

Unit-II: New Public Administration

4. New Public Administration – Minnowbrook-I
5. New Public Administration – Minnowbrook-II
6. New Public Administration – Minnowbrook-III

Unit-III: Market Theories

7. Public Choice Approach
8. New Public Management

Unit-IV: Emerging Trends-I

9. Public Policy and Governance
10. Role of Public Services in the Emergence and Development of New State of Telangana

Unit-V: Emerging Trends-II

11. Globalization and Public Administration
12. Present Status of Public Administration in the context of Globalization

References

Heady F. (1996) Public Administration: A Comparative Perspective (5th ed.) New York: Marcel Dekker.

Heaphey J. (1968) Comparative Public Administration: Comments on current characteristics, Public Administration Review, 28 (3), 242-249.

Montgomery, J. (1966) Approaches to Development Politics, Administration and Change, New York, McGraw Hill.

Pai Panandikar, V.A. (1964) Development Administration: An Approach, Indian Journal of Public Administration, 10 (1), pp. 34-44.

Raphaeli, N. (1967) Readings in Comparative Public Administration, Boston, Massachusetts: Allyn and Bacon. Riggs F.W. (1970) The Ecology of Administration, Bloomington: Indiana University.

Riggs F.W. (1956) Public Administration: A neglected factor in economic development, Annals of the American Academy of Political and Social Sciences, No. 305, Agrarian Societies in Transition, (May 1956), 70-80.

Swerdlow, I. (1963) (ed). Development Administration: Concepts and Problems, Syracuse, New York: Syracuse University Press.

W.E. Weidner, (ed) (1970), Development Administration in Asia, Durham, North Carolina; Duke University Press. Waldo D (1963) Comparative Public Administration: Prologue, Performance and Problems, Indian Journal of Political Science, 24 (3), pp. 177-216.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A II year, Revised Semester wise Syllabus (w. e. f. 2020-21)

Subject: Public Administration

Course outcome:

- To understand the concept of Office;
- To comprehend the administrative process in office;

- To identify the challenges of public office administration in the background of ICT
- To sketch out the impact of technology in office administration

SEC 1 : Public Office Administration

Unit – I: Introduction

a) Office Administration: Meaning, Scope & Importance of Office
b) Changing Nature of Public Office
c) Basic Principles of Office Organization

Unit II: Office Organization and Management

a) Office Planning
b) Office Accommodation and Lay-out
c) Office Environment

SEC II: Office Processes

Unit I : Office filling system

a) Forms: Management and Control
b) Filing System and Classification
c) Management of Office Records

Unit II: Office Communication

a) Periodical Reports
b) Office Communication; Correspondence
c) Inventory Control; Office Stationery

References:

Pillai R.S.N. (2010) Office Management, S.Chand, New Delhi.

Sudhir Andrews (2008) Front Office Management and Operations, Tata McGraw Hill Publishing Co. Ltd,India.

Balachandran V. (2009) Office Management, Tata McGraw Hill Publishing Co. Ltd, India. Bhatia R.C. (2005) Principles of Office Management, Lotus Press, Delhi.

Gopala Krishnan and Sundaresan, M. (2000) Materials Management: An Integrated Approach, PrenticeHall, India

Sharma, R.K. and Others (1991) Office Management, Kalyani Publishers, New Delhi Niraj Kumar (2013) Modern Office Management, New Royal Book Company. Lucknow.

Chopra, R.K. (2008) Modern Office and Its Management, Himalaya Publishing House, Hyderabad.

Semester III

Paper – III: Union Administration

Course outcomes:

- To understand the historical evolution and socio-economic, political, cultural and global context of Indian Administration;
- To identify the transformative role of Indian Administration;

- To make out the multi-dimensionality of problems and processes of Indian Administration;
- To understand the form and substance of Indian Administration; and
- To appreciate the emerging issues in Indian Administration in the context of changing role of state, market and civil society.

Unit I: Historical background

1. Evolution of Indian Administration
2. Indian Administration after Independence: Continuity and Change
3. Indian Constitutional Moorings and Administration.

Unit- II: Union Administration: Structure and Processes

4. Political Executive at Central Level
   a) President ii) Prime Minister iii) Council of Ministers
5. Central Secretariat and other Offices

Unit-III: Centre-State Relations

6. Centre-State Administrative Relations
7. Central Personnel Agencies-All India Services

Unit-IV: Constitutional and Other National Bodies

8. Union Public Service Commission
9. (i) Election Commission; (ii) Comptroller and Auditor General of India (C&AG)
10. NITI Aayog

Unit-V: Public Enterprises in India

11. Forms of Public Enterprises - Department, Corporation, Company
12. Performance and Disinvestment

References:

Bidyut Chakravarthy, Prakash Chand (2019), Indian Administration: Evolution and Practise, Sage Publications Krishna K.Tummala (1996), Public Administration in India, Allied Publishers Limited.

Kuldeep Mathur (2019), Recasting Public Administration in India: Reform, Rhetoric, and Neoliberalism, Oxford University Press

M.Sharma (2004), Indian Administration, Anmol Publishers.

Meredith Townsend (2019), The Annals of Indian Administration, Volume-3, Creative Media Partners. Parmar, A., A Study of Kautilya's Arthashastra, Delhi, Atma Ram & Sons, 1987

Radha Krishna Sapru (2019), Indian Administration: Foundations of Governance, Sage Publications. Ramesh K Arora, Rajni Goyal (2018), Indian Public Administration: Institutions and Issues, New Age International Publishers.

S.R.Maheswari (2004), Indian Administration, Orient Longman Publishers Limited.

Siuli Sarkar (2018), Public Administration in India (Second Edition), PHI Learning Private Limited. Vaman Govind Kale (2010), Indian Administration, Kessinger Publications.

P.D. Sharma and B.M. Sharma (2009) Indian Administration: Retrospect and Prospect, Rawat Publications.

Semester-IV

Paper IV (DSC 403): State Administration

Course outcomes:

After study of the course, the learner should be able to:

- discern the connects and disconnects between structure, purpose and process andresults in Indian Administration;
- Understand the Indian Administration role as the main instrument of State to achieveits developmental goals;
- Appreciate the varying historical, socio-economic, political and other conditioningfactors that gave Indian Administration its distinct nature to the learner

Unit-I: State Administration: Structure and Processes

a. Administrative History of Telangana
b. Political Executive at State Level, Governor& Chief Minister

Unit-II: State Administrative Mechanisms

a. State Secretariat & Directorates
b. Local Governance & District Administration in Telangana

Unit- III: Emerging Issues

a. Administrative Reforms: Need and Importance
b. 2nd Administrative Reforms Commission – Features and Recommendations

Unit-IV: Technology and Integrity in Government

a. e-Government
b. Values and Ethics in Administration

Unit-V: Control over Administration

a. Redressal of Citizen Grievances: Transparency, Accountability and Right to Information Act
b. Administrative Accountability: Legislative and Judicial Control

References:

Bidyut Chakravarthy, Prakash Chand (2019), Indian Administration: Evolution and Practise, Sage Publications Krishna K.Tummala (1996), Public Administration in India, Allied Publishers Limited.
Kuldeep Mathur (2019), Recasting Public Administration in India: Reform, Rhetoric, and Neoliberalism, Oxford University Press
M.Sharma (2004), Indian Administration, Anmol Publishers.
Meredith Townsend (2019), The Annals of Indian Administration, Volume-3,
Creative Media Partners. Parmar, A., A Study of Kautilya's Arthashastra, Delhi, Atma Ram & Sons, 1987
Radha Krishna Sapru (2019), Indian Administration: Foundations of Governance, Sage Publications. Ramesh K Arora, Rajni Goyal (2018), Indian Public Administration: Institutions

and Issues, New Age International Publishers.
S.R.Maheswari (2004), Indian Administration, Orient Longman Publishers Limited.
Siuli Sarkar (2018), Public Administration in India (Second Edition), PHI Learning Private Limited. Vaman Govind Kale (2010), Indian Administration, Kessinger Publications.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A III year, Revised Semester wise Syllabus (w. e. f. 2018-19)

Subject: Public Administration

SEMESTER – V

General Elective- I: Indian Constitution and Administration

Course outcome:

- To learn in details of the Constitution of India, the basic objectives and functioning of the government.
- To understand about the social change, defining the relationship between citizen and the state.
- To examine in-depth analysis of various basic areas of constitution of India.
- To learn in details of the Indian constitution, functioning of government in general and accountability and citizen control over administration in particular.

Unit 1: Indian Constitution

a) Nature of the Constitution Salient features – Preamble
b) Fundamental Rights, Directive Principles; Fundamental Duties
c) Amendments of the Constitution: Procedure for Amendment– Emergency Provisions

Unit II: Centre – State Relations and Local Self Government

a) Distinctive features of Indian Federation
b) Legislative, Administrative and Financial relations between the Union and the States
c) Decentralization Experiments in India – 73rd and 74th Amendments

Unit III: State Government

a) Governor, Chief Minister and Council of Ministers
b) Secretariat and Directorates
c) Changing Nature of District Administration and the role of District Collector

Unit IV: Accountability & Control

a) Legislative, and Executive Control
b) Judicial control and Judicial Review
c) Right to Information Act

References:

Bidyut Chakravarthy, Prakash Chand (2019), Indian Administration: Evolution and Practise, Sage Publications Krishna K.Tummala (1996), Public Administration in India, Allied Publishers Limited.
Kuldeep Mathur (2019), Recasting Public Administration in India: Reform, Rhetoric, and Neoliberalism, Oxford University Press
M.Sharma (2004), Indian Administration, Anmol Publishers.
Meredith Townsend (2019), The Annals of Indian Administration, Volume-3,
Creative Media Partners. Parmar, A., A Study of Kautilya's Arthashastra, Delhi, Atma Ram & Sons, 1987
Radha Krishna Sapru (2019), Indian Administration: Foundations of Governance, Sage Publications. Ramesh K Arora, Rajni Goyal (2018), Indian Public Administration: Institutions and Issues, New Age International Publishers.
S.R.Maheswari (2004), Indian Administration, Orient Longman Publishers Limited.
Siuli Sarkar (2018), Public Administration in India (Second Edition), PHI Learning Private Limited. Vaman Govind Kale (2010), Indian Administration, Kessinger Publications.

Paper V (DSE 503A): Human Resource Management

Course outcomes:

- To comprehend the nature, scope, structure & processes of human resource management;
- To identify the systems and processes of financial and material management;
- To appreciate institutional capacity building strategies and programmes; and
- To understand the changing paradigms of Resources management.

Unit-I: Introduction

a. Meaning and Significance of Human Resource Management
b. Human Resource Planning

Unit-II: Human Resources

a. Job Analysis, Job Description,
b. Recruitment and Promotion
c. Compensation Administration - Wage, Pay and Pay Commissions

Unit- III: Capacity Building

a. Performance and Competency Mapping System
b. Employee Capacity Building Strategies-Training
c. Sensitivity Training

Unit-IV: Reforms

a. Reddressal of Employee Grievances
b. Right sizing, Outsourcing and Consultancies
c. Interpersonal Skills

Unit V: Emerging Trends

a. Human Resource Audit
b. Total Quality Management
c. Productivity Management

References:

Armstrong, Michael (2007), A Handbook of Human Resource Management Practice, Kogan Page, London.
Aswathappa K. (2013), Human Resource Management: Text and Cases, McGraw Hill, NewDelhi
Farazmand , Ali (1994), Handbook of Bureaucracy, Taylor & Francis , New York. Flippo Edvin B., (1976), Principles of Personnel Management, McGraw-Hill
Goel, S.L.& Rajneeesh, Shalini(2003), Public Personnel Administration, Deep & Deep, Delhi Government of India, Second ARC, Tenth Report on 'Refurbishing of Personnel Administration' Jack Robin, et al (eds) (1994), Handbook of Public Personnel Administration, Taylor & Francis,NY Jain, R.B.(1994), Aspects of Personnel Administration, IIPA, New Delhi
Maheswari Sriram (2005), Public Administration in India: The higher Civil Service, Oxford University Press, New Delhi
Naff , Katherine C., Norma M. Riccucci, (2014) ,Personnel Management in Government: Politics and Process(Seventh Edition), CRC, Taylor & Francis, New York.

Rural Governance (Optional)

Course outcomes:

- To understand the concept of democratic decentralization;
- To trace the evolution of local self-government in India;
- To comprehend the institutional arrangements and processes of rural and urban governance;
- To identify the challenges of development and the administrative responses.
- To sketch out the new organizational arrangements for delivery of public welfare programmes.

Semester-V
Paper VI (DSE 503B): Rural Governance

Unit-I: Introduction

a. Democratic Decentralization and Local Organisations
b. Evolution of Rural Governance Institutions-Balwanth Rai Mehta
c. Ashok Mehta Committee

Unit:-II

a. Third Generation Panchayats
b. Constitutional Status of Rural Local Government- with special reference to 73rd CAA

Unit-III: Local Organisations for Rural Development

a. Panchayati Raj: Patterns, Functions and Performance
b. Finances of Panchayati Raj Institutions --- State Finance Commission

Unit-IV: Rural Development Strategies and Services

a. Rural Development: Strategies, Programs and Issues
b. Co-operatives: Structure, Functions and Performance
c. Basic Services and Welfare Measures in Rural Areas (MNREGA, NRLM, SHYAMA MUKHERJEE RURBAN MISSION)
d. State Control over Rural Local Governments

Unit V: Emerging Trends

a. Rural Unrest
b. Land Reforms
c. Corporatization of Agriculture

References:

B.D.S. Bhadouria and V.P. Dubey (1989)., Panchayati Raj and Rural Development, Commonwealth Publishers, New Delhi.
B.S. Khanna , (1992), Rural Development in South Asia Deep and Deep, New Delhi.
Danny Burns, et. al. (1994), The Politics of Decentralisation: Revitalising Local Democracy ,Macmillan, London. George Mathew (1994), Panchayati Raj in India: From Legislation to Movement, ISS, New Delhi.
Jain L.C, et.al (1986), Grass without Roots; Rural Development Under Government Auspices, Sage
K.C. Sivaramakrishanan, et. al. (1993), Urbanisation in India: Basic Services, ISS, New Delhi.
M.A. Oommen (1995), Devolution of Resources from the State to the Panchayati Institutions, ISS, New Delhi.
M.A. Oommen and Abhijit Datta (1995), Panchayats and their Finance, ISS,
New Delhi. Mohit Bhattacharya (1976), Management of Urban Government
in India: Uppal, New Delhi.
Peter Oakley (1991), Projects with People: The Practice of Participation in Rural Developent, ILO
R. C. Choudahry and S.P. Jain (eds.) (2001) Patterns of Decentralized Government in
Rural India, NIRD, Hyderabad.
Ramesh K. Arora and Rajni Goyal (1996), Indian Public Administration Vishwa Prakashan, New Delhi.
S.N. Mishra (1996), New Panchayati Raj in Action, Mittal Publication, New Delhi.
S.R. Maheshwari (2003), Local Government in India, Lakshmi Narain Aggarwal.

SEMESTER VI

GENERAL ELECTIVE II: Good Governance

Course outcomes:

- To enable the students about issues of social coordination and patterns of governance
- To make the students understanding the theories of governance, various concepts of state and its institutions.
- To enable the students in understanding basic tenets and concepts of good governance
- To enable the students in understanding various processes of good governanace

Unit - I: Introduction

a) Meaning and Definitions of Governance
b) Government and Governance
c) Concepts of Good Governance

Unit – II: Citizen and Governance

a) Rule of Law and Human Rights

b) Accountability
c) Participation

Unit - III: Techniques of Good Governance

a) Openness and Transparency
b) Citizen Charter
c) Social Audit

Unit - IV: Emerging Trends

a) Public and Private Governance
b) Good Governance and Civil Society
c) ICT and Good Governance

References:

Bell, S., and Hindmoor, A. (2009) Rethinking Governance: The Centrality of the State in Modern Society, Cambridge: Cambridge University

Bell, Stephen and Andrew Hindmoor. (2009) Rethinking Governance: The Centrality of the State in Modern Society. Cambridge: CUP.

Bevir, Mark (2009), Key Concepts in Governance, Sage, London.

Bevir, Mark, ed. (2010) The Sage Handbook of Governance. Thousand Oaks, CA: Sage Bovaird, Tony and Elke Löffler, eds. (2009) Public Management and Governance, Routledge. Farazmand, Ali and Jack Pinkowski, eds. (2006) Handbook of Globalization, Governance, and Public Administration. London: CRC/Taylor & Francis.

Hajer, Maarten, and Hendrik Wagenaar (2003) "Introduction." In Deliberative Policy Analysis: Kjaer, A (2004) Governance. Cambridge, UK: Polity Press.

Kooiman, Jan ed. (1993) Modern Governance: New Government-Society Interactions. London: Sage.

Semester-VI:

Paper – VII (DSE 603/A): Financial and Material Management

Course Outcomes:

After study of the course, the learner should be able to:

- Understand the way in which the public power is exercised and public resources aremanaged and expanded;
- Unravel the varying methods of performance assessment of public institutions; and
- Appreciate the changing paradigms of human resource management.

Paper – VII (DSE 603/A): Financial and Material Management

Unit- I: Financial Management

a. Meaning and Scope
b. Importance of Financial Management

Unit-II: Budget

a. Concept and Principles of Budget
b. Preparation, Enactment and Execution of Budget
c. Gender Budget and Green Budget

Unit-III: Financial Institutions

a. Organization and Functioning of Finance Ministry
b. Finance Commission
c. Union – State Financial Relations

Unit IV: Parliamentary Financial Committees

a. Financial Control Mechanisms
b. Public Accounts Committee and Estimates Committee
c. Committee on Public Undertakings

Unit- V: Materials Management

a. Meaning and Concept of Materials Management
b. Procurement, Storage and Distribution
c. Inventory Control and Management

References:

Brigham Eugene F. (2011), Financial Management : Theory and Practice, Cengage LearningGovernment of India, Second Administrative Reforms Commission, Fourteenth Report, Strengthening Financial Management, Systems, April 2009.
L.K.Jha (1986), Economic Administration in India – Retrospect and Prospect, New Delhi: IIPALee Robert D. Jr., et al (Eds) (2007), Public Budgeting Systems, Jones & Bartlett Learning.
Mahajan Sanjeev Kumar Mahajan (2014), Financial Administration in India,PHI, DelhiMikesell,John (2010), Fiscal Administration, Cengage Learning.
R.K. Lekhi and Joginder singh(2013), Public Finance, Kalyani Publishers, New Delhi.
Rabin Jack, et.al (2006) Handbook of Public FinancialManagement, Taylor & Francis Group.Sharma M.K. (2006), Financial Administration, Anmol Publications, New Delhi.
Steppan J. Beiley (1995), Public Sector Economics: Theory, Policy and Practice, LondonWang Xiaohu (2010), Financial Management in the Public Sector,M. E. Sharpe.

Paper – VIII (DSE 603/B) : Urban Governance

Course Outcomes:

After study of the course, the learner should be able to:

- Critically appreciate the relationship of local governance and development;
- Appreciate the rural and urban institutional arrangements for development;
- Understand the processes and results of systems of delivery of welfare programmes

Unit-I: Local Organisations for Urban Development

a. Evolution of Urban Local Bodies- Pattern, Functions and Performance
b. Constitutional Status of Urban Local Governments with special reference to 74th CAA

Unit-II: Strategies for Urban Development

a. Urban Development: Strategies, Programs and Issues
b. Finances of Urban Local Governments

Unit-III: Urban Services

a. Basic Services and Welfare Measures in Urban Areas
b. Urban Development Authorities and Parastatals
c. Sustainable Development and Future of Urban Governance

Unit-IV: Agencies and Programs for Rural and Urban Sector

a. Development Planning, District Planning Committee
b. Special Agencies Urban Development
c. Elimination of Poverty Initiatives in Urban Areas

Unit V: Emerging Trends

a. Urban Reforms in India: SMART and AMRUT Cities
b. Swachh Bharat Mission
c. Urban Unrest

References:

Aziz Abdul (ed.), (1996), Decentralised Governance in Asian Countries, Sage New Delhi.
Baud, Isa S A, J De Wit (2009), New Forms of Urban Governance in India: Shifts, Models, Networks and Contestations, SAGE Publications.
Bhattacharya , Mohit (1976), Management of Urban Government in India, Uppal, New Delhi
Burns, Danny et. al. (1994), The Politics of Decentralisation: Revitalizing Local Democracy Macmillan, London, Chaturvedi T.N. and Abhijit Datta (1984), Local Government, IIPA, (New Delhi.
Devas Nick(2004) ,Urban Governance Voice and Poverty in the Developing World, Routledge. Maheshwari, S.R. (2003), Local Government in India, Lakshmi Narain Aggarwal, Agra.
Oakley Peter (1991), Projects with People: The Practice of Participation in Rural Development , I.L.O., Geneva. Oakley Peter, et. Al (1984), Approaches to participation in Development, I.L.O., Geneva.
Pierre , Jon (2011), The Politics of Urban Governance: Rethinking the Local State, Palgrave MacMillan. Prasad , R N(2007), Urban Local Self-Government in India ; With Reference to North-Eastern States, Mittal Publications.
Rao , C. Nagaraja (2007),Accountability of Urban Local Governments in India, Atlantic, New Delhi Sivaramakrishanan K.C., et. al. (1993), Urbanisation in India: Basic Services and People's Participation, ISS, New Delhi.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A)

BEGUMPET

CHOICE BASED CREDIT SYSTEM

(CBCS)

SYLLABUS

Under Graduate Programme

DEPARTMENT OF STATISTICS

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyze the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual.

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional, National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program Specific Outcome (PSO):

- Statistics is the language of the uncertainties riddled modern information age. This program is a compact combination of detailed courses of Statistics and Operations research to complement and offer diversification after the completion of program.
- The thrust of the program is to provide a platform for pursuing higher studies leading to post-graduate or doctorate degrees. Along with this students are equipped with skill enhancement courses like Research methodology, Statistical packages and R language.
- Apart from this there is a range of Generic electives courses in Economics, Commerce, Computer Science etc. which students choose as per their interest and aptitude. This enhances theoretical rigor with technical skills which prepare students to become globally competitive to enter into a promising professional life even after graduation.
- This program offers a range of traditional avenues in academics, Govt. Service, IAS, Indian Statistical/ Economic Services, Industries, Commerce, Investment Banking, Banks and Insurance Sectors, CSO and NSSO, Research Personnel/Investigator in Govt. organizations such as NCAER, IAMR, ICMR, Statistical and Economic Bureau & various PSUs., Market Research, Actuarial Sciences, Biostatistics, Demography etc.
- It also provides an array of non-traditional employment avenues ranging from Stock Brokers Analyst, Sports Analyst, Poll Analyst, Business Analyst, Financial Analyst, Content Analytic.

Course Outcomes:

1. **Descriptive Statistics:**
    - The learning objectives include summering the data and to obtain its salient features from the vast mass of original data.
    - After completing this course, the students should have developed a clear understanding of Concepts of statistical population and sample, variables and attributes.
    - Tabular and graphical representation of data based on variables.
    - 'Conditions for the consistency' and criteria for the independence of data based on attributes. Measures of central tendency, Dispersion, Skewness and Kurtosis.
    - Moments and their use in studying various characteristics of data.
    - Different approaches to the theory of probability.
    - Important theorems on probability and their use in solving problem.
    - Concept of correlation, various correlation coefficients- Pearson's correlation coefficient, Spearman's rank correlation coefficient, partial correlation coefficient and Multiple correlation coefficient. Concept of Principle of least squares for curve fitting and regression lines.

Paper- I: Descriptive Statistics and Probability
(4 HPW with 4 credits and 100 marks)
Unit –I
Descriptive Statistics: Concept of primary and secondary data, Methods of collection and editing of primary data. Designing a questionnaire and a schedule. Sources and editing of secondary data. Classification and tabulation of data. Measures of central tendency and measures of dispersion with simple applications. Moments:- Importance, central and non-central moments, and their interrelationships, Sheppard's corrections. Skewness and Kurtosis and their measures with real life examples.
Unit –II
Probability: Basic concepts in probability—deterministic and random experiments, trail, outcome, sample space, event, and operations of events, mutually exclusive and exhaustive events, and equally likely and favorable outcomes with examples. Mathematical, statistical and axiomatic definitions of probability with limitations. Properties of probability based on axiomatic definition. Conditional probability and independence of events. Addition and multiplication theorems for n events. Boole's inequality and Bayes' theorem. Problems on probability using counting methods and theorems**.**
Unit-III
Random Variables: Definition of random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function with illustrations. Distribution function and its properties. Transformation of one-dimensional random variable (simple 1-1 functions only). Notion of bivariate random variable, bivariate distribution and statement of its properties. Joint, marginal and conditional distributions. Independence of random variables**.**

Unit –IV

Mathematical Expectation: Mathematical expectation of a function of a random variable. Raw and central moments and covariance using mathematical expectation with examples. Addition and multiplication theorems of expectation. Definition of moment generating function (m.g.f), cumalant generating function (c.g.f), probability generating function (p.g.f) and characteristic function (c.f) and statements of their properties with applications. Chebyshev's , and Cauchy-Schwartz's inequalities and their applications.

Probability Distributions:

Course Outcomes:

- A probability distribution is a statistical model that shows the possible outcomes of a particular event or course of action as well as the statistical likelihood of each event.
- Probability distribution functions are quite important and widely used in actuarial science (insurance), engineering, physics, evolutionary biology, computer science and even social sciences such as psychiatry, economics and even medical trials.

Paper- II: PROBABILITY DISTRIBUTIONS
(4 HPW with 4 Credits and 100 Marks)

Unit –I

Discrete distributions – I **:** Uniform and Bernoulli distributions : definitions, mean, variance and simple examples. Definition and derivation of probability function of Binomial distribution, Poisson distribution definition, properties of these distributions such as median, mode, m.g.f, c.g.f., p.g.f., c.f., and moments up to fourth order, reproductive property, wherever exists, and their real life applications. Poisson approximation to Binomial distribution.

Unit –II

Discrete distributions – II**:** Negative binomial, Geometric distributions: Definitions and physical condition, properties of these distributions such as m.g.f, c.g.f., p.g.f., c.f. and moments upto fourth order, reproductive property, wherever exists, lack of memory property for Geometric distribution and their real life applications. Poisson approximation to Negative binomial distribution. Hyper-geometric distribution – definition, physical conditions, derivation of probability function, mean, variance and real life applications. Binomial approximation to Hyper-geometric.

Unit-III

Continuous distributions – I: Rectangular and Normal distributions – definition, properties such as m.g.f., c.g.f., c.f. and moments up to fourth order, reproductive property, wherever exists

and their real life applications. Normal distribution as a limiting case of Binomial and Poisson distributions.

Unit –IV

Continuous distributions – II : Exponential, Gamma : definition, properties such as m.g.f., c.g.f., c.f. and moments up to fourth order, reproductive property wherever exists and their real life applications. Beta distribution of two kinds : Definitions, mean and variance. Cauchy distribution - Definition and c.f.
Definition of convergence in Law, in probability and with probability one or almost sure convergence. Definition of Weak Law of Large Numbers (WLLN) and Strong Law of Large numbers (SLLN). Definition of Central Limit Theorem (CLT) for identically and independently distributed (i.i.d) random variables with finite variance

Sampling Distributions:

Course Outcomes:

- To understand the concept of sampling distributions and their applications in statistical inference.
- To understand the process of hypothesis testing and its significance 3. Importance of Standard Error and to draw conclusions using p-value

Paper- III: Statistical Methods and Theory of Estimation
(4 HPW with 4 credits and 100 marks)

Unit –I

Bivariate data, scattered diagram, Principle of least squares, Fitting of straight line, second degree parabola, quadratic and power curves. Concepts of correlation, computation of Karl Pearson correlation coefficient for grouped and ungrouped data and properties.

Correlation ratio, Spearman's rank correlation coefficient and its properties. Simple linear regression, correlation verses regression, properties of regression coefficients.

Unit –II

Concepts of partial and multiple correlation coefficients (only for three variables). Analysis of categorical data, independence and association and partial association of attributes, various measures of association (Yule's) for two way data and coefficient of contingency (Pearson and Tcherprow), coefficient of colligation**.**

Unit – III

Concepts of population, parameter, random sample, statistic, sampling distribution and standard error.Standard error of sample mean(s) and sample proportion(s). Exact sampling distributions-Statement and properties of $\chi 2$, t and F distributions and their interrelationships. Independence of sample mean and variance in random sampling from normal distributions.

Point estimation of a parameter, concept of bias and meansquare error of an estimate. Criteria of good estimator- consistency, unbiasedness, efficiency and sufficiency with examples.

Unit – IV

Statement of Neyman's Factorization theorem, derivations of sufficient statistics in case of Binomial, Poisson, Normal and Exponential (one parameter only) distributions.Estimation by method of moments, Maximum likelihood (ML), statements of asymptotic properties of MLE.Concept of interval estimation.Confidence intervals of the parameters of normal population by Pivot method.

Statistical Inference:

Course Outcomes:

- Drawing conclusions about the whole population on the basis of a sample. Statistical inference is the process of deducing properties of an underlying probability distribution by analysis of data.
- Inferential statistical analysis infers properties about a population; this includes testing hypotheses and deriving estimates.

Nonparametric Methods.

- Testing of hypothesis using Non-Parametric tests like Median test, Runs test, U test, etc. and ability to use them judiciously for the testing of given data.

Paper- IV: Statistical Inference
(4 HPW with 4 credits and 100 marks)

Unit –I

Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test. One and two tailed tests, test function (non-randomized and randomized).Neyman-Pearson's fundamental lemma for Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their powers.

Unit II

Large sample tests for single sample mean , difference of means, single sample proportion, difference of proportion and difference of standard deviations. Fisher's Z- transformation for population correlation coefficient(s) and testing the same in case of one sample and two samples. Definition of order statistics and statement of their distributions.

Unit – III

Tests of significance based on $\chi 2$- $\chi 2$ test for specified variance, goodness of fit and test for independence of attributes(r x s, 2x k and 2x2 contingency tables). Tests of significance based on Student's t- t test for single mean , difference of means for independent and paired samples, sample correlation coefficient. F test for equality of population variances.

Unit – IV

Non-parametric tests- their advantages and disadvantages, comparison with parametric tests.Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon –Mann-Whitney U test, Wald Wolfowitz's runs test**.** Use of central limit theorem in testing.

Sampling Techniques and Forecasting Methods

Course Outcomes:

- Survey Sampling provides the tolls/ techniques for selecting a sample of elements from a target population keeping in mind the objectives and nature of population. Most of the research work is done through Sample Survey.. After completing the course, students should have developed clear understanding of : Basic concepts of survey sampling.
- Principles of survey sampling and main steps involved in selecting a sample.
- Simple random sampling.
- Stratified random sampling
- Systematic sampling

Time Series

- Advanced understanding of the concepts of time series and their application to health, climate, finance and other areas.
- Familiarity with a range of examples for the different topics covered in the course.

- An advanced understanding of the underlying concepts in the time series and frequency domains.
- Apply ideas to real time series data and interpret outcomes of analyses.

Demand analysis

- To make student understand the demand and supply analysis in business applications.
- Understand how supply and demand interact to determine equilibrium price and quantity

Paper V- Sampling Theory, Time series and Demand Analysis
(3 Hours Per Week with 3 Credits)

UNIT-I

Sample Surveys: Concepts of population, sample, sampling unit, parameter, statistic, sample frame and standard error. Principal steps in sample surveys - need for sampling, census versus sample surveys, sampling and non- sampling errors, sources and treatment of non-sampling errors, advantages and limitations of sampling.

Sampling Methods: Types of sampling: Subjective, probability and mixed sampling methods. Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in Simple Random Sampling With and Without Replacement

UNIT-II

- Estimates of population mean, total, and proportion, their variances and the estimates of variances in the following methods.
- (i) Stratified Random Sampling with Proportional and Neyman allocation, and
- (ii) Systematic Sampling when N= nk.
- Comparison of relative efficiencies. Advantages and disadvantages of SRS, Stratified and Systematic sampling methods.

UNIT-III

- **Time series:** Time series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares and moving average methods. Growth curves and their fitting with reference to Modified exponential, Gompertz and Logistic curves. Determination of seasonal indices by Ratio to moving average, ratio to trend and link relative methods.

UNIT-IV

- **Demand Analysis**: Introduction. Demand and supply, price elasticity of supply and demand. Methods of determining demand and supply curves, Leontief's ,Pigous's methods of determining demand curve from time series data, limitations of these methods Pigou's method from time series data. Pareto law of income distribution curves of concentration.

Statistical Quality Control :

Course Outcomes:

- Understand the role of statistical tools in quality improvement
- Understand the different types f variability, rational subgroups, and how a control chart is used to detect assignable causes.
- Construct and interpret control charts for variables such as $\bar{x}$, R, S and Individual charts.
- Construct and interpret control charts for attributes such as p, np, U charts.

Index Numbers

- Interpret and use a range of index numbers commonly used in the business sector
- Define an index number and explain its use
- Perform calculations involving simple, composite and weighted index numbers
- Understand the basic structure of the consumer price index (CPI) and perform calculations involving its use

Paper- VI: Statistical Quality Control , Reliability &Index numbers
(3 Hours Per Week with 3 Credits)

UNIT –I

Statistical Quality Control: Importance of SQC in industry. Dimensions of quality, Statistical basis of Shewart control charts. Construction of control charts for variables (mean, range and standard deviation) and attributes (p , np with fixed and varying sample sizes) and their Interpretation.

UNIT –II

Control charts for attributes (c and u charts with fixed and varying sample sizes) and their Interpretation. Construction of control charts for Natural tolerance limits and specification limits, process capability index and modified control charts.

UNIT –III

Acceptance sampling plans:. Concept of AQL and LTPD. Producers risk and consumer's risk Single and Double sampling plans for attributes and their OC and ASN functions. Design of single and double sampling plans for attributes using Binomial and Poisson distributions. Construction of OC and ASN functions.

Reliability: Introduction. Hazard function, Exponential distribution as life model, its memory-less property. Reliability function and its estimation. System reliability - series, parallel and k out of N systems and their reliabilities with simple examples.

UNIT –IV

Index Numbers: Concept, construction, uses and limitations of simple and weighted index numbers. Laspeyer's, Paasche's and Fisher's index numbers, criterion of a good index numbers, problems involved in the construction of index numbers. Fisher's index as an ideal index number. Fixed and chain base index numbers. Cost of living index numbers and wholesale price index numbers. Base shifting, splicing and deflation of index numbers

Design of Experiments:

Course Outcomes:

- DOE is a tool to develop an experimentation strategy that maximizes learning using a minimum of resources. Extensively used by engineers and scientists involved in the improvement of manufacturing processes to maximize yield and decrease variability. It is widely used in many fields with broad application across all the natural and social sciences, to name a few: Biostatistics, Agriculture, Marketing, Software engineering. Industry etc. After completing Course in DOE students should have developed a clear understanding of: The fundamental concepts of design ofexperiments.
- Introduction to planning valid and economical experiments within givenresources.
- Completely randomized design.
- Randomized block design.
- Latin square design

Indian Official Statistics: The students are able to know about Indian Official Statistical System.

Paper- VII: Design of Experiments, Vital statistics, Official Statistics and Business Forecasting
(3 HPW with 3 Credits)

UNIT –I

Analysis of Variance and Design of Experiments : Concept of Gauss-Markoff linear model with examples, statement of Cochran's theorem, ANOVA – one-way, two-way classifications with one observation per cell Expectation of various sums of squares, Statistical l analysis, Importance and applications of design of experiments.

UNIT –II

Principles of experimentation: Analysis of Completely randomized Design (C.R.D), Randomized Block Design (R.B.D),Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

UNIT – III

Vital statistics: Introduction, definition and uses of vital statistics. Sources of vital statistics, registration method and census method. Rates and ratios, Crude death rates, age specific death rate, standardized death rates, crude birth rate, age specific fertility rate, general fertility rate, total fertility rate. Measurement of population growth, crude rate of natural increase- Pearl's vital index. Gross reproductive rate sand Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

UNIT – IV

Official Statistics: Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in the estimation of national income.

Business Forecasting: Role of forecasting in Business, Steps in Forecasting, Methods of Forecasting, Choice of a method of Forecasting, Theories of Business Forecasting, Cautions while using Forecasting Techniques.

Operations Research:

Course Outcomes:

- The 'Operations Research' is not only confined to any specific agency like defence services but today it is widely used in all industrial organizations.
- It can be used to find the best solution to any problem be it simple or complex. It is useful in every field of human activities.
- Thus, it attempts to resolve the conflicts of interest among the components of organization in a way that is best for the organization as a whole. Main fields where OR is extensively used are:

1. National Planning and Budgeting
2. Defense Services

3. Industrial Establishment and Private Sector Units
4. Research & Development and Engineering

Paper- VIII: Operations Research
(3 HPW with 3 Credits)

UNIT –I

Operations Research: Meaning and scope of OR. Convex sets and their properties. Definition of general LPP. Formulation of LPP. Solution of LPP by graphical method. Statements of Fundamental theorem of LPP and other related theorems. Simplex algorithm.

UNIT –II

Concept of artificial variables. Big –M /Penalty method and two-phase simplex methods. Concept of degeneracy and resolving it. Concept of duality of LPP. Dual Primal relationship, Statement of Fundamental Theorem of Duality.

UNIT –III

Definition of transportation problem, TPP as a special case of LPP, Initial basic feasible solutions by North-West Corner Rule, Matrix minimum method and VAM. Optimal solution through MODI tableau and stepping stone method for balanced and unbalanced transportation problem. Degeneracy in TP and resolving it. Concept of Transshipment problem.

UNIT –IV

Formulation and description of Assignment problem and its variations. Assignment problem as special case of TP and LPP. Unbalanced assignment problem, optimal solution using Hungarian method and traveling salesman problem and its solution.
Problem of Sequencing. Optimal sequence of N jobs on two and three machines without passing.

Concepts of Sequences of Random Variables

Course Outcomes:

- Understand the definition of a stochastic process and in particular a Markov process;

- Classify a stochastic process according to whether it operates in continuous or discrete time and whether it has a continuous or a discrete state space, and give examples of each type process;
- Describe a Markov chain and its transition matrix;
- Calculate the distribution of a Markov chain at a given time;
- Classify the states of a Markov chain;
- Determine the stationary distributions of a Markov chain;
- Demonstrate how a Markov chain can be simulated;
- Describe a time-inhomogeneous Markov chain and its simple applications;

SEC-1: Concepts of Sequences of Random Variables
(2 HPW with 2 Credits and 50 Marks)

UNIT-I

Stochastic process, Index set, state space, classification of stochastic process with examples, stationary process, Covariance stationary process, Martingale sequence of random variables. Applications of stochastic process through examples.

UNIT-II
Definition and examples of finite- dimensional distributions of Markov Chain, time-homogeneity, transition probability matrix, marginal distribution. Classification of states-recurrent, transient, positive recurrent and null recurrent states.

Course Outcomes:

Statistics for Psychology and Education

- Explain the logic and appropriate applications of statistical analyses for univariate or bivariate research designs, problems, or hypotheses.
- Calculate the statistics necessary to solve problems (both manually and via computer), including descriptive statistics, statistical significance tests, effect sizes, and confidence intervals.
- Communicate the meaning of statistical analyses in everyday language and professional formats (e.g., graphs, tables, and words).

SEC-2: Statistics for Psychology and Education

(2 HPW with 2 Credits and 50 Marks)

UNIT-I

Introduction, scaling procedures, scaling of rankings interms of Normal probability curves.

UNIT-II

Reliability of test scores, effect of test length and different ranges on reliability of the test, Validity of test scores, comparison between reliability and validity.

Course Outcomes:

Big Data Analysis

- The main goal of this course is to help students learn, understand and practice big data analysis and machine learning approaches, which includes the study of modern computing big data technologies and scaling up machine learning techniques focusing on industry applications.
- Mainly the course outcomes are : Conceptualization and summarization of big data and machine learning, trivial data vs big data , big data computing technologies, machine learning techniques and scaling up machine learning approaches.

The students learning outcomes are designed to specify what the students will be able to perform after completion of the course:

- Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
- Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.
- Ability to solve problems associated with batch learning and online learning, and the big data characteristics such as high dimensionality, dynamically growing data and in particular scalability issues.
- Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies.
- Ability to recognize and implement various ways of selecting suitable model parameters for different machine learning techniques.
- Ability to integrate machine learning libraries and mathematical and statistical tools with modern technologies

SEC-3: Big Data Analysis
(2 HPW with 2 Credits and 50 Marks)

UNIT I

The Rise of Big Data: What is Big Data and why does it matter; Web Data: The original Big Data; The cross section of Big Data and the value they hold;

UNIT II

Taming Big Data: The Technologies, Process and Methods: The Evolution of Analytic Scalability, The Evolution of Analytic Process, The Evolution of Analytic Tools and Methods.

Course Outcomes:

Statistical Techniques in Data Mining

- To introduce students to basic applications, concepts, and techniques of data mining.
- To develop skills for using recent data mining software (eg. R) to solve practical problems in a variety of disciplines.
- To gain experience doing independent study and research

SEC-4: Statistical Techniques in Data Mining
(2 HPW with 2 Credits and 50 Marks)

UNIT-I

Introduction: Introduction to Data mining, The nature of Data sets, Types of structure, Models and patterns, Data mining Tasks, components of data mining algorithms, The Interacting roles of Statistics and Data mining, Data mining: Dredging, snooping and fishing.
UNIT-II

Data mining: Definitions, KDD vs Data mining, DBMS vs DM, other related areas, DM Techniques, other mining problems, Issues and challenges in Data mining,

Association Rules: What is an association rule, methods to discover association rules; Apriori Algorithm, Partition Algorithm

GOVERNMENT DEGREE COLEGE FOR WOMEN
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BEGUMPET, HYDERABAD

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BOARD OF STUDIES IN SOCIOLOGY

For

B A SOCIOLOGY

UNDER GRADUATE PROGRAMME

IN

CHOICE BASED CREDIT SYSTEM

(w.e.f. 2019-2020 Onwards)

Faculty of Social Sciences

GDCW (A), Begumpet, Hyderabad

Scheme for CBCS in BA SOCIOLOGY - 2020-21

Course	Name of the Module	Hours/week	No. of Credits
Semester-I			
DSC 1	**Fundamentals of Sociology**	5	5
Semester-II			
DSC 2	**Indian Society: Structure and Change**	5	5
Semester-III			
DSC 3	**Rural and Urban Sociology**	5	5
SEC 1	**Project Planning and Report Writing**	2	2
SEC 2	**Applied Sociology**	2	2
Semester-IV			
DSC 4	**Research Methodology**	5	5
SEC 3	**Rural Development and Management**	2	2
SEC 4	**NGO Management**	2	2
Semester-V			
DSE 5	**A. Sociology of Development** **B. Social Stratification and Social** **C. Mobility Social Anthropology**	5	5
GE	**Social Issues, Policies and Development**	4	4
Semester- VI			
DSE 6	**A. Industrial Sociology** **B. Political Sociology** **C. Medical Sociology**	5	5
PR/GE	Project Report/ Gender and Society	4	4

DSC: Discipline Specific Course; DSE: Discipline Specific Elective; SEC: Skill Enhancement Course; GE: Generic Elective; T: Theory; P: Practical; PR: Project Report;

PROGRAMME OUTCOMES:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Programme Specific Outcomes:

By the end of this course, the students will be able to:

- Understand the various sociological concepts and basic theories
- Understand the ideas inculcated in western and Indian sociological thoughts
- Understand the praxis of sociological thoughts
- Understand the social problems of Indian society with relation to its structure and culture.
- Employ skills in specific areas related to Sociology such as urban sociology, developmental sociology, and public policy.
- Apply research methodology skills for designing and undertaking social research projects.
- Awareness of ethical issues: Emphasizing on academic and research ethics, academic and empathetic understanding of issues pertaining to vulnerable sections of Indian society.

GOVERNMENT DEGREE COLLEGE FOR WOMEN
(AUTONOMOUS)
BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A. I year, Revised Semester wise Syllabus (w. e. f. 2019-20)

Subject: Sociology

Semester – I

PAPER-I: FUNDAMENTALS OF SOCIOLOGY

Course Outcomes:

- Understanding in brief knowledge of human society and structure and also sociology.
- Get to know the nature of society.
- Understand the structure of social culture and socialization.
- Understand the function of social institutions
- To learn in details about sociological perspectives and ideologies of sociological thinkers on society.

Unit I: Introduction to Sociology

a) French and Industrial Revolutions – Origin and Emergence of Sociology
b) Definition, Nature and Scope of Sociology and its relationship with other Sciences.
c) Sociology as Discipline, Scientific Method, Methods and Tools used in Sociology

Unit II: Basic Concepts

d) Society, Community, Association, Institution
e) Social Group: Its typologies - Primary, Secondary, In and Out Groups, Vertical andHorizontal, Geminschaft and Geshellschaft, Peer Group and Reference group
f) Social Structure - Social System - Social Organization - Social Norms, Values andCustoms

Unit III: Culture, Sociological Processes and Institutions

g) Culture: Definition - Elements of Culture, Cultural Relativity; Cultural Lag, Acculturation, Enculturization, Ethnocentricism, Xenocentricism
h) Socio-cultural Process: Associative and Dissociative Processes – Socialization:
Definition, Stages, Types, Agencies and Theories – CH Cooley, GH Mead, Sigmund Freud

i) Social Institutions: Marriage, Family, Kinship, Religion and Political Systems
j) Social Control: Formal and Informal Agencies
k) Social Stratification and Mobility – Forms – Caste – Class, Gender

– Estate, SocialChange: Meaning, Factors and Theories

Unit IV: Sociological Perspectives

l) Structural-Functional
m) Conflict
n) Symbolic and Interactionist Perspective
o) Phenomenology and Ethnomethodology

Unit V: Sociological Thinkers:

p) August Comte: Positivism, Hierarchy of Sciences, Social Static and Dynamics, SocialProgress.
q) Herbert Spencer: Organic View of Analogy, Societal Evolution,
r) Karl Marx- Historical Materialism, Mode of Production, Alienation, Class Struggle.
s) Emile Durkheim: Division of labour, Social Fact, Suicide, Religion and Society.
t) Max Weber: Social Action, Ideal Types, Authority, Bureaucracy, Protestant Ethics andthe Spirit of Capitalism.

References:

CN Shankar Rao (2008): Sociology: Principles of Sociology with an Introduction to Social Thoughts, S.ChandPublications, New Delhi.

Anthony Giddens (2017): Sociology, Atlantic Publishers & Distributors Pvt Ltd

Alex Inkeles (1979): What is Sociology?: An Introduction to the Discipline and Profession, Prentice Hall IndiaLearning Private Limited

Semester – II

PAPER- II: INDIAN SOCIETY: STRUCTURE AND CHANGE

Course outcomes:

- Explore the roots of Indian civilization.
- Know economy, polity and society of ancient, medieval and modern India.
- Understand and analyze the key concepts of Hinduism, Jainism, Buddhism, Islam and impact of these religions on society.
- Demonstrate social, economic, political transformation of Indian society under colonial rule.
- Realize the basic issues of Indian society like unity in diversity, problems of nationalism and principles of Indian Constitution.

- Define globalization and analyze its impact on social, economic, political, cultural spheres.

Unit I: Perspectives on the study of Indian society:

a) Indological/Textual – Manu, Dumont, Ghurye
b) Structural-Functionalism – M.N. Srinivas, S.C. Dube
c) Marxist Perspective: DP Mukherjee,A.R. Desai,
d) Civilization Approach: NK Bose, Surajit Sinha
e) Subaltern Perspective: Phule, BR Ambedkar, David Hardiman

Unit II: Historical Mooring of the Indian Society

f) Traditional Hindu Social Organisation and Vedic Indian Society- Ashrama Dharma,
Pursharthas
g) Emergence of Buddhism, Advent of Islam and Europe Colonization
h) Cultural Assimilation and Unity in Diversity in India

Unit III: Social Structure

i) Rural and Agrarian Social Structure
j) Caste System:Perspectives on the study of caste systems, Features of caste system.Untouchability - forms and perspectives.
k) Tribal communities in India
l) Social Classes in India: Agrarian Class Structure, Industrial Class Structure.Middle classes in India.
m) Family, Marriage and Kinship in India.
n) Religious Compositions in India –Communalism, Social Tensions, Religious Revivalism,Problems of Religious Minorities.

Unit IV: Social Change in India

o) Vision of Social Change in India: Idea of Development Planning and Mixed Economy - Constitution, Law and Social Change - Education and Social Change- Green Revolutionand Social Change
p) Industrialisation and Urbanisation
q) Social Movements in Modern India: Peasant, Tribal, Backward Class, Dalit and Women

Unit V: Challenges for Social Transformation:

r) Crisis of Development: Displacement and Environmental Issues – Question ofRehabilitation and Sustainability.
s) Social Problems in India: Poverty, Violence against women, Caste and Ethnic Conflicts,Illiteracy and Disparities in Education, Unemployment and Youth Unrest, Corruption etc

References:

1. Yogesh Atal (2016): Indian Society: Structure and Change: Continuity and Change,

Pearson Education India

2. Ram Ahuja (1999): Society in India: Concepts, Theories and Recent Trends, Rawat Publications, Jaipur
3. CN Shankar Rao (2006): Sociology of Indian Society, S.Chand Publications, New Delhi
4. BK Nagla (2012):Indian Sociological Thought, Rawat Publications, Jaipur

GOVERNMENT DEGREE COLLEGE FOR WOMEN

(AUTONOMOUS)

BEGUMPET, HYDERBAD

(Re-accredited by NAAC with "B" Grade)

B. A. II year, Revised Semester wise Syllabus

Subject: Sociology

Semester – III

PAPER- III: RURAL AND URBAN SOCIOLOGY

Course outcomes:

- Understand the profile of rural and urban community.
- Introduce the basic concepts of Rural Community and Rural Development.
- Create awareness among government schemes in rural and urban developments.
- Define urban sociology and demonstrate the nature and scope of urban sociology.
- Develop an understanding about trends of urbanization in India and impact of urbanization on Indian society.
- Develop awareness about urban problems and policies adopted to solve such problems.

Unit I: Rural and Urban Sociology

a) Meaning, Importance, Nature and Scope of Rural and Urban Sociology
b) Rural and Urban Communities: Characteristics
c) Rural-Urban Continuum
d) Concept of Settlement: Village, Town, City

Unit II: Social Structure of Villages:

e) Caste System, Jajmani System, Caste based Segregation,
f) Agrarian Social Structure and Emerging Class Structure in Rural India
g) Caste and Class

h) Gram Swaraj, Panchayat Raj
i) Impact of Green Revolution and Land Reforms in India
j) Migration: Push Factors, Rural to Urban
k) Rural Development and Poverty Alleviation Programmes
   - CDP, IRDP, SGSY, MGNREGS, NRLM

Unit III: Urbanization as a Process

l) Impact of Industrialization on Urbanization in India
m) Urban Areas: Definition, Types and Growth
n) Urbanism as a Way of Life
o) Migration: Pull Factors, Urban to Urban

Unit IV: Urban Ecology

p) Theories of City Growth: Central Place Theory, Concentric Zone Model, Hoyt SectorTheory, Multiple Nuclei Theory

Unit V: City Planning, Practices and Problems

q) Urban Problems: Over-Population, Housing, Slums, Unemployment, EnvironmentalPollution, Traffic Congestion, Urban Poverty, Education, Health
r) Urban Development Programmes: JNNURM, SSRY, Smart Cities Project
s) Urban Planning: Principles and Practices
t) Role of a Sociologist in Country and Town Planning

References:

1. A.R. Desai (2011), Rural Sociology in India, Popular Prakashan Ltd, New Delhi
2. Surinder S. Jodhka (2018): A Handbook of Rural India, Orient Blackswan Private Limited, Hyderabad.
3. Partha Sarathi De (2012): Rural Sociology, Pearson Publications
4. KL Sharma (2013): Readings in Indian Sociology, Sage India Publications, New Delhi
5. SL Doshi (1999): Rural Sociology, Rawat Publication, Jaipur
6. Rajendra Kumar Sharma (2002): Urban Sociology, Atlantic Publications
7. Ramachandran R (1997): Urbanizatiion and Urban Systems in India, Oxford University Press (India)
8. Rangwala (2015): Town Planning, Charotar Book Distributors, Anand (GJ)
9. MSA Rao (1991): Reader in Urban Sociology, Orient Blackswan Private Limited, Hyderabad.
10. Sujata Patel & Kushal Deb (2009): Urban Studies, Oxford University Press (India)

Semester - III

PAPER – SEC 1: PROJECT PLANNING AND REPORT WRITING

Course Outcomes:

By the end of this course, the students will be able to:

- Perform the research activities in field
- Understand the field issues of research
- Perform the report writing in standard format

Unit-I: Project: Meaning – Design/Typology - Project Life Cycle - Project Workplan - Timeframe – Budgeting. Source of Data - Methods and Tools of Data Collection
- Data Classification and Analysis – Drawing Inferences. Project Monitoring andAppraisal/Evaluation.

Unit-II: Report Writing: Purpose, Audience, Format and Deadline; Selecting and Organizing Material - Classifying Writing Notes, Information Sequence – Ordering - Headings. Tones and Styles - Review and Peer Review - Plagiarism – Project Publishing – Checklists/Appendices.

References:

1. Lawrence Nueman - Social Research Methods, Pearson Publications, Delhi
2. David Evans et al (2014): How to Write a Better Thesis, Springer, Berlin.
3. Janathan Anderson, Berry H. Durston and Millicent Poole (1971): Thesis and Assignment Writing,Wiley Eastern Private Limited, New Delhi
4. Kathryn G. Herr & Gary L. Anderson - The Action Research Dissertation: A Guide for Students andFaculty, Sage Publications, New Delhi.
5. John W Creswell -Research Design: Qualitative, Quantitative and Mixed Methods Approaches, SagePublications.
6. Fred Pyrczak – Making Sense of Statistics: A Conceptual Overview, Pyrczak Publishing, Glendale,CA
7. Fred Pyrczak – Writing Research Reports: A Basic Guide for Students of the Social and BehavioralSciences, Pyrczak Publishing, Glendale, CA

8. Peg Boyle Single - Demystifying Dissertation Writing: A Streamlined Process from Choice of Topicto Final Text, Stylus Publishing, VA, USA

Semester III

PAPER – SEC 2: APPLIED SOCIOLOGY

Course outcomes:

- Understand the role of Medias in the society.
- Understand the career opportunities in future through sociology.
- Understand the social change and modern society.

Unit-I: Introduction to Applied Sociology:

Sociological Imagination - Understanding People as Clients - - Creative Collaboration – Professional Partnerships – Arenas, Settings, Themes and Issues in Counselling:

Arenas: a) Individual Counselling, b) couples Counselling,

a) Family Counselling, d) Counselling in Groups

Settings: as Private Practice - at Voluntary Organization – as Personal Social Service – in Medical or Healthcare settings – in Education – at Workplace – for Professional or Organizational Growth – Brief and time-limited couselling.

Themes: a) Counselling and gender; b) counselling and caste/religion, c) counselling and sexual orientation; d) career counselling and guidance; e) counselling in the context of redundancy and unemployment; f) counselling, death and bereavement; g) counselling people with disabilities/chronic illness; h) counselling people with alcohol and drug problems, i) counselling for trauma and post–traumatic disorder

Issues: a) Research and evaluation in counselling; b) counsellor-client exploitation; c) professional issues in counselling

Unit-II: Doing Counselling:

Distinguishing Academic and Applied Sociology – Clinical Sociology, Social Engineering and Public Sociology.

The foundation skills for Counselling: The Beginning Stage: Exploration, Contracting and Assessment - The Middle Stage: Reassessment and Challenging - The Ending Stage: Action and Closure

References:

Gouldner, Alvin W. and S. M. Miller (1965): Applied Sociology; Opportunities and Problems. NewYork: Free Press.

Roger A. Straus (1994): Using Sociology: An Introduction from the Applied and Clinical Perspectives,General Hall,
Perlstadt, H. (2007): 'Applied Sociology', pp. 342-352 in C. D. Bryant and D. L. Peck (Eds) 21st CenturySociology: A Reference Handbook. Thousand Oaks: Sage Publications.
Olsen, M.E., and M. Micklin (1981): Handbook of AppliedSociology. New York: Praeger.
L.F. Ward (2015): Applied Sociology, Nine Books (First edition), ISBN: 978-9352290574

Semester IV
PAPER – IV: RESEARCH METHODOLOGY

Course Outcomes:

By the end of this course, the students will be able to:

- Understand the meaning of social research, processes and steps in social research
- Understand the meaning of quantitative and qualitative social research and its scientific orientation
- Understand the methods of data collection and sampling techniques
- Understand the process of analysis and interpretation in qualitative research
- Perform the analytical operation through social statistics and report writing.

Unit I: Social Research

a) Theory and Research –Concepts, Construct, Values, Hypothesis – Scientific Method,Subjectivity vs Objective Debate, Value Neutrality.
b) Meaning, Definitions and Characteristics of Social Research
c) Types of Research: Pure and Applied – Qualitative and Quantitative - Cross-sectional andTime Series.
d) Purpose of Research: Exploratory, Descriptive and Explanatory
e) Major Steps in Social Research.

Unit II: Quantitative and Qualitative Research:

f) Research Design – Aims and Importance – Types of Research Design – Exploratory Design –Descriptive Design – Experimental design – Their Advantages and Disadvantages.

Unit III: Sampling Techniques:

g) Universe/Population, Characteristics of Sample, Criteria for Sample Size – Sample SizeFormulas.
h) Sampling Design: Probability and Non-Probability Methods - Sampling Errors.

Unit IV: Tools and Methods of Data Collection:

i) Observation, Interview, Case Study, Focus Group Study, Content Analysis, PRA/PLA
j) Interview Schedule, Questionnaire, Survey Format.

Unit V: Data Processing, Classification, Tabulation and Report Writing.

k) Social Statistics –their Importance, Types and Usages.
l) Frequency Distribution Tables – Diagrammatic and Graphic Representation of Data.
m) Measures of Central Tendency: Mean, Median, Mode
n) Research Report Writing – Purpose, Audience – Format, Tones & Styles (Citation &References)

References:

1. Lawrence Nueman - Social Research Methods, Pearson Publications, Delhi
2. OR Krishnaswamy – Research Methodology, Himalaya Publishing House, Hyderabad.
3. C R Kotari – Research Methodology: Methods and Techniques, New Age International Publishers, NewDelhi
4. Fred Pyrczak – Making Sense of Statistics: A Conceptual Overview, Pyrczak Publishing, Glendale, CA
5. Ram Ahuja (2001): Research Methodology, Rawat Publications, New Delhi/Jaipur
6. Ranjit Kumar (2014): Research Methodology, Sage Publications, New Delhi
7. Willie Tan (2017): Research Methods: A Practical Guide For Students and Researchers, World Scientific Publishing Company Pvt. Ltd., Willie Tan, NUS, Singapore.
8. Kakali Bhattacharya (2017): Fundamentals of Qualitative Research, Routledge, London

Semester IV

PAPER – SEC 3: RURAL DEVELOPMENT AND MANAGEMENT

Course outcomes:

- Understand the structure, function, and integration of the rural society with a thrust on integrated rural development.

- Empower students for self-employment through rural entrepreneurship, establishing rural agro-clinics etc.

Unit-I: Concepts and Theories of Rural Development – Rural Development: Planning, Polices and Strategies - Rural Development Approaches during Pre- Independence viz Martandam Experiment, Sriniketan Experiment, Gurgaon Experiment, Gandhian Experiment, Bhoodan and Gramdan and other important Experiments. Post-Independence: Different Approaches taken by the Governments for Rural Development – Adopted Villages, Model Villages – Rural Development and Five Year Planning - Development of Weaker Sections in Rural Areas.

Unit-II: Rural Development Management: Principles, Techniques and Practices – Planning, Organization Structure and Design - Motivation and Leadership - Management Control and Managerial Decision Making - Management of Rural Institutions; Rural Marketing Management: Rural Credit, Micro-Finance – Self- Help Groups – Cooperative Bodies - Social Audit.

References:

Katar Singh & Anil Shishodia (2016): Rural Development: Principles, Policies, and Management, SagePublications, New Delhi.

Manie Ahuja (2013): Rural Development: Indian Context, Gullybaba Publishing House, Delhi. MRD-103: Rural Development Planning and Management, Gullybaba Publishing House, Delhi. Krishnamacharyulu (2010): Rural Marketing: Text and Cases, Pearson Education, New Delhi. KB Gupta et al (2005): Rural Management, CBS Publication, Delhi

Dinesh Kumar & Punam Gupta (2017): Rural Marketing: Challenges and Opportunities, SagePublications, New Delhi.

Stephen P. Robbins et al (2016): Fundamentals of Management, Pearson Education, New Delhi.

Newaz Ahmed Chowdhury (2010): Rural Development Management by Village Based Co-OperativeSociety, LAP Lambert Academic Publishing, Saarbrücken, Germany.

Semester IV

PAPER – SEC 4: NGO MANAGEMENT

Course outcomes:

- To acquire specific knowledge on project and NGO management.
- To enhance skills and techniques of project evaluation / Resource Mobilization.

- To understand the basic concepts and principles involved in managing NGOs.
- To enhance knowledge on project proposal writing and maintenance of the accounts in NGO's.

Unit-I:

Concept of Volunteerism: Charity, Welfare and Development - Non-Governmental Organization (NGO): Its Characteristics, Types, Functions, Approaches and Models – Legal Framework for Establishment of NGO - Vision, Mission and Goals of NGOs - Resource Mobilization: Methods and Techniques of Fund Raising - Rules and Regulations of Income Tax Exemption (80-G, 12- A, & 35AC) - Foreign Contributions and Regulation Act (FCRA).

Unit-II:

NGO Management: Staffing, Recruiting, Induction and Training - Office Procedure and Documentation - Basics of Accounting – Budgeting. Project Management: Identification – Need Assessment – Problem Tree - Formulation Project Proposal - Project Appraisal: Technical,Economic and Financial Feasibility. Project Management in NGO: Projects Implementation, Monitoring and Evaluation (PERT, CPM, PRA/PLA, SWOT).

References:

Clark John. (1991): Voluntary Organizations: Their Contribution to Development. London: Earth Scan.Jain R.B. (1995): NGOs in Development Perspective. New Delhi: Vivek Prakasan

Sakararan and Rodrigues. (1983): Handbook for the Management of Voluntary Organization. Madras:Alfa

Joel S.G.R Bhose. (2003): NGOs and Rural Development Theory and Practice. New Delhi: Concept.

Julie Fisher. (2003): Non-Governments – NGOs and the Political Development of the Third World. NewDelhi: Rawat

Ginsbery Leon. H. (2001): Social Work Evaluation – Principles and Methods. Singapore: Allyn and Bacon.

GOVT DEGREE COLLEGE FOR WOMENS

BEGUMPET (AUTONOMOUS)

HYDERABAD-50016

DEPARTMENT OF SANSKRIT

- PROGRAME OUTCOMES
- SPESIFIC OUTCOMES
- COURSE OUTCOMES
- LEARNING OUTCOMES

B.A B.SC & B.COM WITH SANSKRIT AS A SECOND LANGUAGE(SEM-I,SEM-II,SEM-III&SEM-IV)

PROGRAM OUTCOMES PROGRAM SPECIFIC OUTCOMES AMD LEARNING OUTCOMES OF SANSKRIT.

Sanskrit language is introduced in UG level as a second language. Program outcomes specific program outcomes and course outcomes and learning outcomes of Sanskrit language are given bellow.

Programme Outcomes:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

This program will help you acquire the following skills as a basis for the study of ancient Indian knowledge systems, culture, literature and history through Sanskrit texts.

PSO1 – To improve communication skills in spoken sanskrit

PSO2 – To understand basic concepts in linguistics and their usage.

PSO3 – To make acquaintance with major literary writers, genres and periods.

PSO4 – To know variety of forms of literature, creating writing in sanskrit

PSO5 – To make critical appreciation of the masterpieces in literature.

LEARNING OUTCOMES OF SANSKRIT IN UG LEVEL

- Advanced knowledge of ancient Indian religion, literature, and history through the study of Sanskrit texts
- Advanced command of the Sanskrit language through advanced text reading, and basic knowledge of Sanskrit, or Vedic Sanskrit.
- Insight into one or more fields of specialization within the broader topic of ancient Indian religion, literature and history through Sanskrit texts.
- Ability to critically assess existing research through careful reading, analysis, and discussion.
- Practice of the textual analysis of texts in Sanskrit or Vedic Sanskrit.
- The ability to apply relevant theoretical perspectives to topics within the field of ancient Indian religion, literature and history through Sanskrit texts.
- The ability to develop a research project, including formulation of a research problem, searching for sources, and engaging in analytic discussion.
- Competence in academic writing and oral presentation skills.
- Competence in presenting academic research about ancient Indian religion, literature and history through Sanskrit texts to a broader non-academic public.
- Ability to work both independently and in groups on presentations and/or development of Projects.

Semester 1

Unit 1

Lesson 1: मुदाभिषेक्तुं वरद त्वमर्हसि

- Students will know many aspects from this lesson
- Role of leader: Through the character of Dhasharata, we get to know the administrative qualities required by a leader in policy making and approval of the subjects. This is very much required in today scenario.
- Virtuous Qualities : through the character of Lord Rama
- Poetic aesthetic sense: through the description of the incident student gets to know the appreciation of the beauty of the poetry.

Lesson 2 : हिमालयोनाम नगाधिराज:

This lesson is purely an aesthetic poetry, which reflects the imagination of the poet.

- Students will know about the ancient geographical conditions of Continents and India particularly. Himalayas
- The seasonal changes which we see normally in other parts of the country, can be seen throughout the year, in Himalayas making the place enchanting.
- Routine of the sages practiced daily and their life style can be known.
- Knowledge about various flora and fauna is known.
- Knowledge about various clans of semi gods(Kinnara, Vidhyadhara, Gandharvas) who are described only in puranas are known. Their activities which are performed in the beautiful places of Himalayas are known.
- Knowledge about various herbs and medicinal plants are known.
- The characteristics of cruel animals and tribal people life is depicted.

Unit 2

Lesson 3: धर्म बध्दो दौवारिक :

Appointment of subordinates as per Arthashastra.

- The administrative skill in protection of frontiers by posting honest and vigilant officers.
- Surveillance and monitoring of the various officers in charge of the frontiers and time to time reviewing their duties.
- Honesty and integrity of people at all levels.

Lesson 4: कृतज्ञे नास्ति निष्कृति:

- Knowledge about text of Panchatantra one of the important text in Neeti shastra.
- The lesson explains about the life skills needed to survive in the contemporary world.
- The attitude which can be imbibed to achieve success.
- The value based education based on the animal characters.
- Moral lessons of facing unprecedented situations and protecting self from dangers.
- Knowledge about choosing friends circle and advisory council for well being.

Unit 3

Lesson 5 : एष धर्म: सनातन:

- This lesson deal with human and ethical values to be imbibed by students.
- The 25 slokas are unique and are based on value education.
- Charactertistics of students, general attitudes and life skills are taught.

Unit 4 Lesson-1 सन्धय :

This is a grammar part of Sanskrit which deals in formation of words with letter combinations reducing the word size.

- The Sanskrit letters which are divide into swara and vyanjanas have natural ability to combine together to form words and sentences for easy usage and speed conversation .
- Knowledge about the usage of different sandhis is known.
- Pronounciation of letter which is important part of sandhi formations are known.

Lesson 2: शब्दा:

- The knowledge of different suffixes added to word for forming a particular word which is used in a sentence with different meanings.
- The knowledge of number, gender, case endings are known.
- Knowledge about crude word formations and their refined forms are known.

Unit 5

Lessons from Baladharsha Sanskrit text

- Reading and writing of Sanskrit script.

Semester 2

Unit 1 Lesson 1 सत्तुप्रस्थस्य महत्त्वम्

- The lesson is taken from Mahabharata hence students will be able to know about the epic written by veda vyasa
- The knowledge about Ashwamedhyaga and the rituals associated with the sacrifice.
- The various forms of vratas to be practiced by men to attain Moksha.
- The virtuous qualities to be practiced when following rituals.
- The quality of generosity and hospitality which are the core qualities of Indian tradition as depicted in epics.

Lesson 2 बुद्धस्य वैराग्योदय:

- Knowledge about Bhuddisim and its philosophy are known.
- The types of suffering and their causes.
- The life history of Bhudda and his renunciation.
- About the materialistic and impermanent life.

Unit 2

Lesson 1 : न गङ्गदत्तः पुनरेति कूपम्

- About Panchatantra and Vishnusharma.
- Knowledge about life skills as to how one should not have contact with enemies.
- About how to protect self from natural enemies.

- To take appropriate decisions when problems arise in family.
- Knowledge about controlling emotions in dealing with family problems.

Lesson 2: वैज्ञानिक संहिता

- Knowledge about Varahamihira the ancient Indian Scientist, astronomer, and philosopher.
- Knowledge about scientific aspects as depicted of Bhrit samhita.
- Knowledge about ancient theories of calculation of time, seasons, stars, planets and earth and their authenticity according to modern theories.
- About astronomy and ancient thoughts.
- Knowledge about various aspects like formation of water bodies and how to identify them, organic farming, suitable places for farming.

Unit 3 Lesson 1 धातव:

- Knowledge about root forms of verbs and their conjugations.
- Three purushas and number is known.
- Helps in memory power and identifying different root forms of verbs and their conjugations.

- Helps to improve Sanskrit vocabulary.

Lesson 2: समासा:

- To construct sentence formations using suitable compounds.
- Different compounds are known.
- Different adjectives are formed with various words.
- Concise of words for meaning full sentences.

Unit 4

Lessons from Baladharsha Sanskrit text

- Reading and writing of Sanskrit script.

Semester 3

Unit 1 Lesson 1: प्रवर्त्ततां प्रकृतिहिताय पार्थिव:

- Knowledge about dramas
- Various concepts realted to dramas.
- About Kalidasa and his greatest work Abhignana shakuntala.
- The over all description about the story of Dhushyanta and Shakuntala found in Mahabharata.

- The description of Earth and its beautiful view from space.
- Ashrama system present in ancient India.
- The difficulties faced by Shakuntala and her determination to overcome the problems of life.

Lesson 2 :नवरत्नानि

- About the author Prof.D Ramulu.
- Knowledge about the nine gems in the court of Vikramaditya.
- Knowledge about the different ancient knowledge systems, like Ayurveda, Nyana shastra, Vedanta, vyakarana shastra, etc.
- How the kings patronized the experts of knowledge.

Unit 2 Lesson 1 शूद्रकवैशम्पायनयो: सम्भाषणम्

- Knowledge about Mahakavi Bana Bhatta.
- About Gadya kavyam and its characteristics are known.
- About the ancient kings, court affairs, intriguing story, characters in the work are known.
- About the etiquettes which are followed in front of the king.
- And the hospitality of the sages.

Lesson-2 रामदास:

- About modern sanskrit poet Sri Sannidhanam surya narayana shastri.
- Life history of Kancherala goppana.
- History of Golconda sultans who ruled Hyderabad.
- Ramadasu devotion towards Lord Rama.
- About the historical place of Badhrachalam temple.

Unit 3 Lesson 1 शब्दा:

Halanta rupani are included in this semester.

- The knowledge of different suffixes added to word for forming a particular word which is used in a sentence with different meanings.
- The knowledge of number, gender, case endings are known.
- Knowledge about crude word formations and their refined forms are known.

Lesson 2 महाकवय :

Bharavi, Sriharsha, Magha, Harshavardhana, Bhasa, Sankharacharya

- The life history of the about great poets and their exceptional works.

Unit 5

Lessons from Baladharsha Sanskrit text

- Reading and writing of Sanskrit script.

Semester 4

Unit 1 Lesson1 चित्रपटदर्शनम्

About the great Dramatist Bhasa and his works.

- About the skill of presenting the story in the form of Drama.
- Highlighting the characters of Lord Rama Sita and Lakmana, Astavakra and others.
- Nostaligic era of years spent in forest by Rama and sita
- All the highlights of Ramayana are covered in first act only.

Lesson2 मधुरोपदेशम्

- About the female author Gangadevi in Sanskrit littreature.
- Ancient history of Vijayanagara and kakathiya empires
- Herioc tale of the king Veerakanparaya
- Instruction about youth

Unit 2 Lesson1 ध्रुवोपाख्यानम्

About Modern Sanskrit laureate P.V.Kane

- About the will power of Druva.
- About puranic stories and the message underlined in it.

Lesson 2 विवेकानन्दविजयम्

About the life of Swami Vivekananda and his endeavors of bringing Indian culture and tradition on to the global forum.

- About the contemporary culture of western countries and their hospitality.
- About the journey of Vivekananda to Chicago by the blessings of his Guru Ramakrishna paramhamsa.

Unit 3 Lesson 1: शास्त्रकारविभाग:

About the life history of the Great authors and their exceptional works.

Lesson 2: कृदन्त रूपाणि

About the suffixes added to roots for formation of verbs which are being used in Sanskrit sentences in different situations.

- Knowledge about various kruth prathyayas and their usage.

Unit 4

Lessons from Baladharsha Sanskrit text
Reading and writing of Sanskrit script.

Semester -1 syllabus

1. हिमालयो नाम नगाधिराजः (Word to Word meaning and Translation & Essay)
कालिदासविरचित कुमारसम्भव महाकाव्य प्रथमसर्ग १-१० श्लोकानि प्रतिपदार्थतात्पर्यं च लिखत, व्यासरूप प्रश्नः

2. मुदाभिषेक्तुंवरद त्वमर्हसि — वाल्मीकि रामायणम् (References and Essay)
(ससन्दर्भ व्याक्ख्यानानि ,व्यासरूप प्रश्नः)

3. धर्मबद्धदौवारिकः — अम्बिकादत्तव्यास विरचित शिवराजविजय (व्यासरूप प्रश्नः) (Essay)

4. कृतज्ञे नास्ति निष्कृतिः — विष्णुशर्मणा विरचित पञ्चतन्त्रम्
व्यासरुपप्रश्नः ससन्दर्भानि व्याक्यात(Essay & References)

A. बालादर्शः - ६ - ९ पाठम्

B. सन्धयः - सवर्णदीर्घ,गुण,वृद्धि,यणादेश,अयवायाव, श्चुत्वा, ष्टुत्वा,लत्त्वा,झश्चा,अनुनासिक,विसर्ग,

C. शब्दाः

बालादर्शः षष्ठः पाठः !

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ISEMSESTER IPAPER SL-SANSKRIT

Time: 2 hrs Marks: 60

SECTION-A

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SECTION B

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II SEMESTER II PAPER SL-SANSKRIT

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Word to word meaning and translation verses 1 to 10&Essay

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II SEMESTER II PAPER SL-SANSKRIT

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SECTION B

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III SEMESTER III PAPER SL-SANSKRIT

MODULE

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बालादर्शः III SEMESTER

चतुर्दशः पाठः। 14th Lesson

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१. अयं बालकः किं लिखति?
२. केन अक्षराणि सुन्दराणि भवन्ति ?
३. राघवः कुतः न लिखति
४. सः प्रतिदिनं पाठालयं कथम् आगच्छति?
५. त्वं केन सह कुत्र गत्वा लेखनीमानयसि ?

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III Semester III Paper SL - Sanskrit

Model Paper

Time:2 Hours Marks: 60

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II. □□□□□□ □□□□□□□□ □□□□□□□□□ □
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द्वयोः श्लोकयोः प्रतितिपदार्थं तात्पर्यञ्च लिखत। 2x5=10

1.सुतनु! हृदयात्प्रत्यादेशव्यलीकमुपैतु ते
किमपि मनसः संमोहो मे तदा बलवानभूत् ।
प्रबलतमसामेवप्रायाः शुभेषु हि वृत्तयः

स्रजमपि शिरस्यन्धः क्षिप्तां धुनोत्यहिशङ्कया॥

2.आखण्डलसमो भर्ता जयन्तप्रतिमः सुतः ।
आशीरन्या न ते योग्या पौलोमीसदृशी भव ॥

3.सुतनु! हृदयात्प्रत्यादेशव्यलीकमुपैतु ते
किमपि मनसः संमोहो मे तदा बलवानभूत् ।
प्रबलतमसामेवंप्रायाः शुभेषु हि वृत्तयः
स्रजमपि शिरस्यन्धः क्षिप्तां धुनोत्यहिशङ्कया॥

4.वसने परिधूसरे वसाना नियमक्षाममुखी धृतैकवेणिः।
अतिनिष्करुणस्य शुद्धशीला मम दीर्घं विरहव्रतं बिभर्ति ॥

IV. □□□□□□□□□□□□□□□□□□ □□□□□□□□□□□□ □□□□□□□ □□□□

10x1 = 10

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VI. "□□□□□□□□□□□□□□□□□□□ □□□□□□□□□□" □□□□□□□□□□□□
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IV SEMESTER IV PAPER SL-SANSKRIT

MODULE

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विंशः पाठः I- 20th Lesson

इदानीं वर्षाकालः । पश्य आकाशं मेघैः सञ्छन्नम्। सर्वत्र वृष्टेः धाराः पतन्ति । जनः स्वीयानि कर्माणि त्यक्त्वा गृहं गताः। पक्षिणः शैत्येन पीडिताः वृक्षाणां शाखासु तिष्ठन्ति । कृषीवलाः परं क्षेत्राणि कर्षन्ति । ते कृष्टेषु क्षेत्रेषु धान्यानि वपन्ति । वर्षाकाले कूपाः सरांसि च जलेन पूर्णानि भवन्ति । नद्योऽपि कूलानि भञ्जयन्त्यः प्रवहन्ति । भूमौ सर्वत्र तृणानि उत्पद्यन्ते वृक्षा लताश्च पल्लविताः भवन्ति ।

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IV SEMESTER IV –PAPER SL-SANSKRIT

Model Paper

I. □□□□□□ □□□□□□□□□□□□ □□□□□□ 1x5 = 5

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II. □□□□ □□□□□□□□□□ □□□□□□□□□□□□ 2x5 = 10

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (A),

BEGUMPET

HYDERABAD-500016

(AUTONOMOUS)

DEPARTMENT OF TELUGU

SYLLABUS 2020-2021

Course Structure: BA/B.Com./B.Sc./BCA/BBA

Semester	Course Title	Course Type	No. of credits			
			L	**T**	**P**	**Tot-al**
I	Poetry, Prose, and Basic Grammar	Core	2	2	-	4
II	Poetry, Prose, Stories and Prosody	Core	2	2	-	4
III	Poetry, Prose, History of Telugu Literature I, and Figures of Speech	Core	2	1	-	3
IV	Poetry, Prose, and History of Telugu Literature II	Core	2	1	-	3
IV	Communicative Skills	Certificate Course	2	-	-	2
IV	Communicative Skills	Certificate Course	2	-	-	2

Programme Outcomes:

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

Program specific outcomes:

After completing the graduation, Telugu students are able to:

PSO 1) How secured a woman needs to be in society

PSO 2) How must she deal with the injustice done to her

PSO 3) Logical Defence in critical situations

PSO 4) Innocence and Determination in Children

PSO 5) Purity and Obedience

PSO 6) What is known to be called wealth

PSO 7) All human relations are bound up with love

PSO 8) Poet shifts the paradigm of monarchic governance

First Semester **60Hrs**

(4hrs/week)

Course outcomes

CO 1) How secured a woman needs to be in society

CO 2) How must she deal with the injustice done to her

CO 3) Logical Defence

CO 4) Innocence in Children

CO 5) Determination

CO 6) Purity

CO 7) Obedience

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Second Semester
60Hrs(4hrs/week)

Course outcomes:

CO 1) One shouldn't have pride

CO 2) Only god could save us on verge of death

CO 3) Behaviour

CO 4) Personality Development

CO 5) Significance of Education

CO 6) Stay away from the wicked

CO 7) Greatness of our motherland

CO 8) Being conscious about the nation's development

CO 9) Letting the whole world know its glory

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Third Semester

60Hrs(4hrs/week)

Course outcomes:

CO 1) Communication skills

CO 2) How to tackle tough situations

CO 3) Parenting

CO 4) Pampering

CO 5) Problems faced by such kids

CO 6) Students focus must be on their teacher

CO 7) A payback must teach a lesson but it shouldn’t turn into a bloodsheding revenge

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Fourth Semester
60Hrs(4hrs/week)

Course outcomes:

CO 1) Jealous must gear up the competitive spirit among students

CO 2) None should think that they are undefeatable

CO 3) God graces knowledge upon us all

CO 4) Personality development

CO 5) Social responsibility

CO 6) Responsibility of the household

CO 7) We must will for the wellbeing of others

CO 8) Compassionate for people

CO 9) Humanity is the most important of all

CO 10) Grievance in our society has to be seen

CO 11) We need to realize what we are doing now without glorifying the past history

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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD-16

Affiliated To Osmania University, Re-Accredited With 'B^{+}' Grade by NAAC

DEPARTMENT OF ZOOLOGY

SYLLABUS (2020-2021)

GOVERNMENT COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD

DEPARTMENT OF ZOOLOGY

Composition of Board of Studies - 2018-2021

S.No	Name	Designation
01.	**Dr.G.S.Jyothirmai** Assistant Professor of Zoology	**Chairman BOS,** **GDC(W) Begumpet**
02.	**Prof. Reddya Naik** Department of Zoology Osmania University	**Chairperson** **BOS, HOD, Osmania University.**
03.	**Dr. K. Anand** Assistant Professor of Zoology**,** GDC, Shadnagar Palamuru University	**Subject Expert Nominated by Academic Council**
04.	**B.Ravinder Rao** Assistant Professor of Zoology**,** BRK GDC, Jadcherla. Palamuru University	**Subject Expert Nominated by Academic Council**
05	**Dr. A VenkataNarsaiah** Sr.Scientist, IICT.Hyd**.**	**Representative from Industry**
06	**Dr.D.Prasanna** Assistant Professor of Zoology	**Member**
07.	**Dr.P.S.Rajani** Assistant Professor of Zoology	**Member**
08.	**Dr.C.Jyothsna** Assistant Professor of Zoology	**Member**
09.	**T Bhavani** MSc Zoology, Nizam college	**Alumnus**

SYLLABUS FOR B.Sc. ZOOLOGY COURSE (2020-21)

Choice Based Credit System (CBCS) 2020-21

S.No	Paper	Module (Paper)	Hours	IA	Sem End Exam	Credits
Semester I						
1	Paper I (Core)	Animal Diversity-Invertebrates	04	40	60	04
2	Practical-I	Animal Diversity-Invertebrates	03		50	01
Semester II						
3	Paper II (Core)	Animal Diversity- Vertebrates	04	40	60	04
4	Practical-II	Animal Diversity- Vertebrates	03		50	01
Semester III						
5	Paper III (Core)	Animal Physiology and Animal Behaviour	04	40	60	04
6	Practical-III	Animal Physiology and Animal Behaviour	02		50	01
7	SEC – I	Sericulture	02	10	40	02
8	SEC – II	Public Health & Hygiene	02	10	40	02
Semester IV						
9	Paper IV (Core)	Cell Biology, Genetics and Developmental Biology	04	40	60	04
10	Practical-IV	Cell Biology, Genetics and Developmental Biology	03		50	01
11	SEC – I	Vermiculture	02	10	40	02
12	SEC – II	Aquaculture	02	10	40	02
Semester V						
13	Paper V (Core) DSCI	Animal Physiology	03	25	75	03
14	Practical-V	Animal Physiology	02		50	01
15	General Elective - I	Nutrition & Dietetics				
16	Paper-VI DSE-IA	Applied Zoology	03	25	75	03

17	**Practical DSE-IA**	**Applied Zoology**	**02**		**50**	**01**
18	**Paper-VI DSE-IB**	**Entomology**	**03**	**25**	**75**	**03**
19	**Practical DSE-IB**	**Entomology**	**02**		**50**	**01**
20	**Paper-VI DSE-IC**	**Sericulture ***	**03**	**25**	**75**	**03**
21	**Practical DSE-IC**	**Sericulture ***	**02**		**50**	**01**
22	**SEC - III**	**Biotechniques**	**02**	10	**40**	**02**
Semester VI						
23	**Paper VII (Core)DSCII**	**Immunology & Animal Biotechnology**	**03**	**25**	**75**	**03**
24	**Practical-V**	**Immunology & Animal Biotechnology**	**02**		**50**	**01**
25	**SEC - IV**	**Perspectives of Food Safety in India**	**02**	10	**40**	**02**
26	**General Elective - II**	**Clinical Science**	**02**	10	**40**	**02**
27	**Paper-VIII DSE-IIA**	**Aquatic Biology ***	**03**	**25**	**75**	**03**
19	**Practical DSE-IA**	**Aquatic Biology ***	**02**		**50**	**01**
20	**Paper-VIII DSE-IIB**	**Public Health & Hygiene**	**03**	**25**	**75**	**03**
21	**Practical DSE-I**	**Public Health & Hygiene**	**02**		**50**	**01**
22	**Paper-VIII DSE-IIC**	**Poultry Science**	**03**	**25**	**75**	**03**
23	**Practical DSE-IIC**	**Poultry Science**	**02**		**50**	**01**
24	**Project Work**	**On the given topic**			**50**	**02**

Programme Outcomes

PO1. Domain Expertise:

- Gain thorough knowledge in the chosen domain and be able to apply it wherever necessary in an innovative manner.

PO2. Modern equipment Usage:

- Equip the students with modern technological skills, so that they are able to use software applications in their careers.

PO3. Computing Skills and Ethics:

- Students learn critical thinking and are able to analyse and solve problems rationally and ethically for communication, entertainment and for the benefit of mankind throughout ones endeavours for the wellbeing of human race.

PO4. Complex Problem Investigation & Solving

- Learn to analyse the problem, frame hypotheses, interpret empirical data and execute action

PO5. Perform effectively as Individuals and in Teams

- Be able to contribute at individual level and as team member and prioritize institutional interest over individual

PO6. Efficient Communication & Life skills

- Learn efficient communication to express, listen, understand and project views in a convincing manner clearly and concisely

PO7. Environmental Sustainability

- Understand current environmental challenges faced by the country & propagate and follow environment friendly practices.

PO8. Societal contribution

- Develop the pride in volunteering to address societal issues *viz:* calamities, disasters, poverty, epidemics and involve voluntarily in social development activities at Regional , National, global levels.

PO9. Effective Project Management

- Identify the goals, objectives and components of a project and then implementation so that deadlines are achieved, even when there are setbacks.

PROGRAM SPECIFIC OUTCOMES (PSOs) OF B. SC., ZOOLOGY

PSO1 Demonstrated a broad understood of animal diversity, including knowledge of the scientific classification and evolutionary relationships of major groups of animals.

PSO2 Recognized the relationships between structure and functions at different levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.

PSO3 Characterized the biological, chemical, and physical features of environments (e.g., terrestrial, freshwater, marine, host) that animals inhabit.

PSO4 Explained how animals function and interact with respect to biological, chemical and physical processes in natural and impacted environments.

PSO5 Explained how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system.

PSO6 Drawing upon this knowledge, they are able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.

PSO7 Understood the applied biological sciences or economic Zoology such as Sericulture, Apiculture, Aquaculture, Industrial microbiology, Biotechnology and Medicine for their Higher studies and Career opportunities.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –I
Module –I /Core-I
Animal Diversity - Invertebrates

Periods: 60 **Max. Marks: 60**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Knowledge about the Diversity and Phylogeny of Invertebrate Phyla

CO2. Discuss the Diversity Of Invertebrate and their Economic Significance

CO3. Know about some of the important and common Protozoans and Helminthes of parasitic nature causing diseases in human beings.

CO4. Understood the diversity and classification and functional aspects of different systems of Arthropoda, Mollusca and Echinodermata.

CO5. Identify the resemblance and evolutionary significance of larval forms of Echinoderms

UNIT – I **(15 Periods)**

1.1 Protozoa.

1.1.1 General characters and classification of Protozoa up to order levels with examples
1.1.2 Type study – *Elphidium*
1.1.3 Locomotion and Reproduction in Protozoa.
1.1.4 Epidemiology of Protozoan diseases - Amoebiasis; Giardiasis; Leishmaniasis and Malaria.

1.2 Porifera

1.2.1. General characters and classification of Porifera up to order levels with examples
1.2.2 Type study – *Sycon*
1.2.3 Canal system in sponges and Spicules.

UNIT – II **(15 Periods)**

2.1. Cnidaria

2.1.1 General characters and classification of Cnidaria up to order levels with examples
2.1.2 Type study - *Obelia*
2.1.3 Polymorphism in Siphonophora
2.1.4 Corals and coral reef formation

2.2 Platyhelminthes

2.2.1 General characters

2.2.2 Classification of Platyhelminthes up to classes with examples
2.2.3 *Schistosoma* structure and lifecycle

2.3 Nemathelminthes

2.3.1 General characters
2.3.2 Classification of Nemathelminthes up to classes with examples
2.3.3 *Dracunculus* structure and lifecycle
2.3.4 Parasitic Adaptations in Helminthes

UNIT – III **(15 Periods)**

3.1 Annelida

3.1.1. General characters
3.1.2. Classification of Annelida up to classes with examples
3.1.3. Type study: *Hirudinaria granulose*
3.1.4 Evolutionary significance of Coelome and Coelomoducts and metamerism

3.2 Arthropoda

3.2.1 General characters
3.2.2 Classification of Arthropoda up to classes with examples
3.2.3 Type study: Prawn
3.2.5 Insect metamorphosis
3.2.6 *Peripatus* – external features and affinities

UNIT – IV **(15 Periods)**

4.1 Mollusca

4.1.1 General characters
4.1.2 Classification of Mollusca up to classes with examples
4.1.3 Type study: *Pila*.
4.1.4 Pearl formation
4.1.5 Torsion and detorsion in gastropods

4.2 Echinodermata

4.2.1 General characters
4.2.2 Classification of Echinodermata up to classes with examples
4.2.3 Water vascular system in star fish
4.2.4 Echinoderm larvae and their significance

PRACTICALS SEMESTER –I

Module –I /Core-I

Animal Diversity - Invertebrates

1. Study of museum slides / specimens / models (classification of animals upto orders)

i. Protozoa: Amoeba, Paramecium, Paramecium- binary fission & conjugation, Vorticella, Entamoeba histolytica, Plasmodium vivax.

ii. Porifera: Sycon, Spongilla, Euspongia, Sycon- TS & LS, Spicules, Gemmule.

iii. Coelenterata: Obelia- colony & medusa, Aurrelia, Physalia, Velella, Corallium, Gorgonian, Pennatula

iv.Plathyhelminhes: Planaria, Fasciola hepatica, Fasciola larval forms – miracidium, redia, cercaria, Echinococcus granulosus, Taenia solium, Schistosoma haematobium**.**

v.Nemathehelminthes: Ascaris (male & female), Dracunculus, Ancylostoma, Wuchereria**.**

vi. Annelida: Nereis, Aphrodite, Chaetopteurs, Hirudinaria, Trochopore larva**.**

vii. Arthropoda: Cancer, Palaemon,Scorpion,Scolopendra, Sacculina, Limuls, Peripatus, larvae-naupilus, mysis, zoea, Mouth parts of male & female anopheles and culex, mouth parts of Housefly and Butterfly.

viii.Mollusca: Chiton, Pila, Unio,Pteredo, Murex, Sepia, Loligo, Octopus, Nautilus, Glochidium larva

ix.Echinodermata: Asterias, Ophiothrix, Echinus,Clypeaster, Cucumaria, Antedon, Bipinnaria larva.

2.Dissections:

- **Prawn: appendages, digestive system, nervous system, mounting of statocyst.**
- **Insect mouth parts.**

3.laboratory record work shall be submitted at the time of practical examination.

4.An **" animal album"** containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.

5.Computer aided techniques should be adopted- show virtual dissections.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-2021
SEMESTER –II
Module –II /Core-II
Animal Diversity- Vertebrates

Periods: 60 **Max. Marks: 60**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Knowledge about the Diversity and Phylogeny of Vertebrates Phyla

CO2. Understand the Nomenclature and Classification of the Major Vertebrate Phyla

CO3. Describe the Morphology and Anatomy of various Vertebrates through type Study

CO4. Understand the Evolutionary importance of Temporal Fossae in Reptiles

CO5. Knowledge about the significance of various types of Adaptations in different Phyla

UNIT – I **(15 Periods)**

1.1. Hemichordata

1.1.1 General characters
1.1.2 Classification of Hemichordata up to classes with examples
1.1.3 *Balanoglossus* - Structure and affinities
1.1.4. General characters and classification of Chordata upto orders with examples.

1.2. Urochordata, Cephalochordata, Cyclostomata

1.2.1. Salient features of Urochordata
1.2.2. Retrogressive metamorphosis and its significance in Urochordata
1.2.3. Salient features and affinities of Cephalochordata
1.2.4. General characters of Cyclostomat. Comparison of the *Petromyzon* and *Myxine*

UNIT – II **(15 Periods)**

2.1. Pisces

2.1.1. General characters of Fishes
2.1.2. Classification of fishes up to order level with examples
2.1.3. *Scoliodon* – Respiratory, Circulatory and Nervous system.
2.1.4. Types of Scales and types of Fins

2.2. Amphibia

2.2.1. General characters of Amphibians
2.2.2. Classification of Amphibians up to orders with examples.

2.2.3. *Rana tigrina* - Respiratory, Circulatory and Nervous system.

UNIT – III **(15 Periods)**

3.1 Reptilia

3.1.1. General characters of Reptilia
3.1.2. Classification of Reptilia up to orders with examples
3.1.3. *Calotes* – Respiratory system, Circulatory and Nervous system.
3.1.4. Temporal fosse in reptiles and its evolutionary importance
3.1.5. Distinguished characters of Poisonous and Non poisonous snakes.

3.2. Aves

3.1.1. General characters of Aves
3.1.2. Classification of Aves up to orders with examples.
3.1.3. *Columba livia* -, Digestive system, Circulatory systems, Respiratory system and Nervous system.

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UNIT – IV **(15 Periods)**

4.1. Mammalia

4.1.1. General characters of Mammalia
4.1.2. Classification of Mammalia up to orders with examples
4.1.3. Rabbit –Digestive, Respiratory, Circulatory and Nervous system.
4.1.4. Dentition in mammals.

4.2. Adaptations in Vertebrates

4.2.1. Parental care in amphibian, neoteny and paedogenesis.
4.2.2. Migration in Birds.
4.2.3. Flight adaptation in Birds
4.2.4. Aquatic adaptations in Mammals

B.Sc. I Year

ZOOLOGY PRACTICAL SYLLABUS FOR II SEMESTER

ZOOLOGY - CORE PAPER – II : Animal Diversity- Vertebrates

Periods: 45 **Max. Marks: 50**

Study of museum slides / specimens / models (Classification of animals up to orders)

1. **Hemichordata:** *Balanoglossus,* Tornaria larva
2. **Protochordata:** *Amphioxus, Amphioxus* T.S. through pharynx
3. **Cyclostomata:** *Petromyzon, Myxine, Ammocoetus larva*
4. **Pisces:** Sphyrna *Pristis, Torpedo, Channa, Pleuronectes, Hippocampus, Exocoetus, Echieneis, Labeo, Catla, Clarius, Auguilla, Protopterus,* Scales: Placoid, Cycloid, Ctenoid
5. **Amphibia:** *Ichthyophis, Amblystoma, Siren, Hyla, Rachophous,Bufo,Rana,* Axolotal larva
6. **Reptilia :** *Draco, Chemaeleon, Gecko, Uromastix, Vipera russelli, Naja, Bungarus, Enhydrina, Typhlops, Testudo, Trionyx, Crocodilus, Ptyas.*
7. **Aves:** Archaeopteryx**,** *Passer, Psittacula, Bubo, Alcedo, Columba, Corvus, Pavo;* Collection and study of different types of feathers: Quill, Contour, Filoplume, Down

8. **Mammalia:** *Ornithorhynchus, Tachyglossus, Pteropus, Funambulus, Manis, Loris,* Hedgehog

Histology: T.S. of Liver, Pancreas, Kidney, Stomach, Intestine, Lungs Artery, Vein, Bone T.S., Spinal cord.

Osteology :

1. Rabbit – Axial skeleton system (bones of Skull and Vertebral Column)
2. Varanus, Pigeon and Rabbit – Appendicular skeleton system (bones of limbs and girdles)

Dissections of *Labeo/Tilapia*:

1. Digestive system.
2. Brain, Weberian ossicles
3. V, VII, IX, X cranial nerves

Laboratory Record work shall be submitted at the time of practical examination
An **"Animal album**" containing photographs, cut outs, with appropriate write up about the above mentioned taxa. Different taxa/ topics may be given to different sets of students for this purpose.

Computer aided virtual dissections.

Suggested manuals

1. **S.S.Lal,** Practical Zoology – Vertebrata

2. **P.S.Verma,** A manual of Practical Zoology – Chordata

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –III
Module –III /Core-III

ANIMAL PHYSIOLOGY AND ANIMAL BEHAVIOUR

Periods: 60 **Max. Marks: 60 M**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Understand the composition of food and mechanism of digestion absorption and assimilation.

CO2. Describe the mechanism of circulation and composition and functions of blood

CO3. Knowledge of Neuromuscular coordination, Osmoregulation in animals and Endocrine system and their functions

CO4. Understand the process of respiration and excretion and the mechanism of transport of gases

CO5. Analyze various types of Animal Behaviour and their significance in their Learning, Memory, Social Behaviour and Communication

UNIT – I **(15 Periods)**

1.1 DIGESTION

1.1.1Enzymes: Definition, Classification, Inhibition and Regulation.
1.1.2 Digestion of Carbohydrates, Proteins, Lipids and Cellulose.
1.1.3 Absorption and Assimilation of digested food;
1.1.4 Role of Gastrointestinal hormones in digestion.

1.2 EXCRETION

1.2.1Classification of Animals on the basis of excretory products- Ammonotelic, Uricotelic, Ureotelic
1.2.2 Structure and function of Nephron.
1.2.3 Urine formation, Counter current mechanism.

1.3 OSMOREGULATION

1.3.1 Water and ionic regulation by freshwater,
1.3.2 Brackish water and marine water animals

UNIT-II **(15 Periods)**

2.1 HOMEOSTASIS

2.1.1 Concept of Homeostasis
2.1.2 Mechanism of Homeostasis

2.2 RESPIRATION

2.2.1 Definition of Respiration , Respiratory mechanisms , External, Internal and cellular Respiration
2.2.2 Respiratory Pigments; transport of oxygen, Oxygen dissociation curves. Bohr's effect. transport of CO_2, Chloride shift;
2.2.3Regulation of respiration – nervous and chemical mechanism

2.3CIRCULATION

2.3.1 Types of circulation - Open and Closed circulation
2.3.2 Structure of Mammalian Heart, Types of hearts – neurogenic and myogenic;
2.3.3Heart function –Conduction and regulation of heart beat,Regulation of Heart rate
2.3.4 Tachycardia and Bradycardia: Blood Clotting mechanism

UNIT – III **(15 periods)**

3.1. MUSCLE CONTRACTION

3.1.1 Types of Muscles
3.1.2 Ultra structure of skeletal muscle fibre
3.1.3 Sliding Filament theory, muscle contraction mechanism. Biochemical changes during muscle contraction.
3.1.4 Twitch tetanus summation,Treppe fatigue.

3.2. NERVE IMPULSE

3.2.1 Structure of Neuron
3.2.2 Resting potential ,action potential and conduction of nerve impulse
3.2.3 Transmission of nerve impulse
3.2.4 Synapse, Synaptic transmission neurotransmitters EPSP,IPSP

3.3ENDOCRINE SYSTEM

3.3.1 Endocrine glands - Structure, secretions and functions of Pituitary, Thyroid, Parathyroid, Adrenal gland and Pancreas

3.3.2 Hormone action and concept of Secondary messengers

3.3.3 Male and Female Hormones, Hormonal control of Menstrual cycle in human beings.

UNIT – IV **(15 periods)**

4.1. Animal Behaviour

4.1.1. Types of Behaviour – instinctive and acquired behavior

4.1.2. Behaviour – taxes, reflexes and tropisms

4.2. **Learning and Memory**

4.2.1. Types of learning- trial and error learning, habituation and imprinting

4.2.2. Conditioning – classical conditioning, instrumental conditioning, examples of conditioning, Pavlov's experiment.

4.3. **Social behavior and Communication**

4.3.1. Colonia**l** existence of bees and termites, pheromone**s**

4.4. Biological rhythms,

4.4.1. Biological clocks, circadian rhythms, circum lunar rhythms, circannular rhythms

ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER

ZOOLOGY - CORE PAPER – III

ANIMAL PHYSIOLOGY AND ANIMAL BEHAVIOUR

Periods: 30 **Max. Marks: 50**

1. Qualitative tests for identification of carbohydrates, proteins and lipids.

2. Qualitative tests for identification of ammonia, urea and uric acid (Nitrogenous excretory products)

3. Effect of pH and Temperature on salivary amylase activity.

4. Study of permanent histological sections of Mammalian Endocrine glands - pituitary, thyroid, pancreas, adrenal gland.

5. Estimation of Haemoglobin by Sahlis method.

6. Estimation of total protein by Lowry's method.

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –IV
Module –IV /Core-IV
Cell Biology, Genetics & Developmental Biology

Periods: 60 **Max. Marks: 60 M**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Describe the composition of prokaryotic and eukaryotic cells.

CO2. Understand the structure of cells and cell organelles in relation to their functional aspects.
CO3. Understand the Structure and functions of Nucleic acids and their role in Protein Synthesis

CO4. Apply the various concepts of Genetics in Problem Solving .

CO5. Understand the Process of Gametogenesis and its significance in the development of an Organism

UNIT – I **(15 Periods)**

1. Cell Biology

1.1. Cell theory, Differences of Prokaryotic and Eukaryotic cells
1.2. Structure and functions of plasma membrane: Structure,composition of Plasma membrane, fluid mosaic model.
1.3.Structure and functions of cell organelles –Endoplasmic reticulum, Golgi body, Ribosomes, Lysosomes ,Mitochondria and Nucleus
1.4. Chromosomes – Structure, types, giant chromosomes
1.5. Cell Division - Mitosis, Meiosis.
1.6. Cell cycle and its regulation.

UNIT – II **(15 Periods)**

2. Molecular Biology

2.1 DNA (Deoxyribo Nucleic Acid) - Structure
2.2 RNA (Ribo Nucleic Acid) - Structure, types
2.3 DNA Replication (Prokaryotes)
2.4 Protein Synthesis – Transcription and Translation (prokaroytes)
2.5 Genetic Code; operon concept: Lac operon
2.6 Molecular Biology Techniques- Polymerase Chain Reaction and Electrophoresis.

UNIT – III **(15 Periods)**

3. Genetics

3.1 Mendals laws of Inheritance and Incomplete dominance,Co-dominance.
3.2 Human Karyotyping and amniocentesis.
3.3. Sex determination and sex-linked inheritance
3.4. Chromosomal Mutations- Deletion, Duplication, Inversion, Translocation.
3.5. Inborn errors of metabolism: Alkaptonuria, Phenylketonuria, Glycogen Storage disease.
3.6. Chromosomal disorders-Down syndrome, Patau's syndrome, Klinefelter's syndrome and Turners syndrome.

UNIT – IV

(15 Periods)

4. Developmental Biology and Embryology

4.1 Gametogenesis (Spermatogenesis and Oogenesis), Fertilization, Types of eggs, Types of cleavages
4.2 Development of Frog up to formation of primary germ layers
4.3 Formation of Foetal membrane in chick embryo and their functions
4.4 Types and functions of Placenta in mammals
4.5 Regeneration in Turbellaria and Lizards

ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER
ZOOLOGY Core Paper – IV
Cell Biology, Genetics and Developmental Biology

Periods: 30 **Max. Marks: 50**

I. Cytology

1. Preparation and Identification of slides of Mitotic divisions with onion root tips
2. Preparation and Identification of different stages of Meiosis in Grasshopper Testes
3. Identification and study of the following slides
    i). Different stages of Mitosis and Meiosis
    ii) Lamp brush and Polytene chromosomes

II. Genetics

1. Problems on Genetics - Mendelian inheritance, Linkage and crossing over, Sex linked inheritance

III. Embryology

1.. Study of T.S. of Testis and Ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8, 16 cell stages); Morula, Blastula
3. Study of chick embryos of 18 hours, 24 hours, 33 hours and 48 hours of incubation

Laboratory Record work shall be submitted at the time of practical examination

An **"Album**" containing photographs, cut outs, with appropriate write-up about Genetics and Evolution.

Computer aided techniques should be adopted as per UGC guide lines.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –V
DSC/Module –V /Core-V/PAPER-V
ANIMAL PHYSIOLOGY

Periods: 60 **Max. Marks: 75**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Understand the composition of food and mechanism of digestion absorption and assimilation.

CO2. Describe the mechanism of circulation and composition and functions of blood

CO3. Knowledge of Neuromuscular coordination and the mechanism of Osmoregulation in animals.

CO4. Understand the process of respiration and excretion and the mechanism of transport of gases

CO5. Identify the occurrence of various types of disorders in man in relation to the secretions of Endocrine glands

UNIT – I **(15 Periods)**

1.1 DIGESTION

1.1.1 Digestion definition and extra and intracellular digestion.
1.1.2 Digestion of Carbohydrates, Proteins, Lipids and Cellulose.
1.1.3 Absorption and Assimilation of digested food; role of Gastrointestinal hormones in digestion.
1.1.4 Disorders of Alimentary canal.

1.2 RESPIRATION

1.2.1 Definition of Respiration and Respiratory mechanisms – External, Internal and cellular.

1.2.2 Respiratory Pigments; Transport of oxygen, Oxygen dissociation curves. Bohr's effect.
1.2.3 Transport of CO_2, Chloride shift; Regulation of respiration – nervous and chemical.
1.2.4 Disorders of respiratory tract

UNIT-II **(15 periods)**

2.1 CIRCULATION

2.1.1 Types of circulation - Open and Closed circulation
2.1.2 Structure of Mammalian Heart, Types of hearts – Neurogenic and Myogenic; Heart function – Conduction and regulation of heart beat.
2.1.3 Regulation of Heart rate – Tachycardia and Bradycardia,
2.1.4 Blood Clotting mechanism

2.2 EXCRETION

2.2.1Classification of Animals on the basis of excretory products- Ammonotelic, Uricotelic, Ureotelic
2.2.2 Internal structure of kidney and Nephron.
2.2.3 Urine formation, Counter current mechanism.

UNIT – III **(15 periods)**

3.1. MUSCLE CONTRACTION

3.1.1 Types of Muscles
3.12 Ultra structure of skeletal muscle fibre
3.1.3 Sliding Filament theory, muscle contraction mechanism. Biochemical changes during muscle contraction.

3.2. NERVE IMPULSE

3.2.1 Structure of Neuron
3.2.2 Nerve impulse - Resting potential and Action potential and Conduction of Nerve impulse
3.2.3 Synapse, types of synapses and Synaptic transmission.

UNIT – IV **(15 periods)**

4.1ENDOCRINE SYSTEM

4.1.1 Endocrine glands - Structure, secretions and functions of Pituitary, Thyroid, Parathyroid, Adrenal gland and Pancreas
4.1.2 Hormone action and concept of Secondary messengers
4.1.3 Male and Female Hormones, Hormonal control of Menstrual cycle in humans.

4.2. HOMEOSTASIS AND ENZYMES

4.2.1 Concept and Mechanism of Homeostasis
4.2.2 Osmoregulation - Water and ionic regulation by freshwater, brackish water and marine animals
4.2.3 Enzymes: Definition, Classification, Inhibition and Regulation.

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER

ZOOLOGY Core Paper – V

ANIMAL PHYSIOLOGY

Periods: 30 **Max. Marks: 50**

1. Qualitative tests for identification of carbohydrates, proteins and lipids.

2. Qualitative tests for identification of ammonia, urea and uric acid (Nitrogenous excretory products)

3. Effect of pH and Temperature on salivary amylase activity.

4. Study of permanent histological sections of Mammalian Endocrine glands - pituitary, thyroid, pancreas, adrenal gland.

5. Estimation of Haemoglobin by Sahlis method.

6. Estimation of total protein by Lowry's method.

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A) BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –V
DSE/ PAPER-VI
SERICULTURE

Periods: 60 **Max. Marks: 75**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Knowledge about the Geographical distribution of different economic races of Silk worms

CO2. Describe the Morphology and Anatomy of silk glands and the Composition of Silk

CO3. Understand the culture methods of different varieties of mulberry plants.

CO4. Identify the diseases and pests of B.mori and their control and management

CO5. Apply the various aspects of Silkworm rearing to establish Sericulture as an Agro industry

UNIT-I: Introduction of Sericulture **15 (periods)**

1.1. History of sericulture and present status of Sericulture industry in India**.**
1.2. Sericulture as agro-industry –perspectives and prospectus of Sericulture in India.
1.3. Geographical distribution of various species and economic races of silkworms- Mulberry, Tasar, Eri and Muga silkworm..
1.4. Types of silkworm host plants and their systematic position.

Unit-II: Biology of silkworms **15 (periods)**

2.1. Morphology and anatomy of silkglands.
2.2. Properties and composition of silk.
2.3. Life cycle, external morphology and biology of Mulberry silkworm.
2.4. Internal morphology of silkworm- Digestive , Respiratory, Nervous, Excretory and Reproductive systems.

Unit-III: Diseases of Silkworm **15 (periods)**

3.1. Influence of biotic and abiotic factors on the incidence of diseases.
3.2 Diseases of Bombyx mori and Philosomia ricini- viral and bacterial, Preventive and control measures.
3.3. Diseases of Bombyx mori and Philosomia ricini- fungal and protozoan, Preventive and control measures.
3.4. Insect and vertebrate pests of silkworm and their management.

Unit-IV: Silkworm rearing **15 (periods)**

4.1. Silkworm rearing house and rearing appliances.
4.2. Feeding and rearing methods of mulberry silkworms.
4.3 Mounting and harvesting of mulberry silk cocoons.
4.4. Commercial characters of cocoons and price fixation.

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER

ZOOLOGY – PAPER - VI

SERICULTURE

Time: 3 Hrs. **Max. Marks: 50**

I. Identification of different types of silkworms.

II. Morphology of egg, larva, pupa and adult of different silkworm types.

III. Life history of different silkworm types.

IV. Dissection of digestive system and salivary gland of silkworm larva.

V. Dissection of the nervous system of larva silkworm.

VI. Rearing appliances.

VII. Sex differentiation of larva, pupa and adult silkworms

VIII. Calculation of shell ratio.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.

SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
SEMESTER –VI
DSC/Module –VII /Core-VII/PAPER-VII
Immunology and Animal Biotechnology

Periods: 60 **Max. Marks: 75**

Course Outcomes

After completion of the course the student is able to:

CO1. Understand the role of Immune System in maintaining Health

CO2. Knowledge of Structure and Function of major organs of Immune system

CO3. Apply knowledge of immunity in Clinical decision making through case studies

CO4. Understand the Animal cell culture and their Applications

CO5. Analyse the Pros and Cons of Various innovations in the field of Biotechnology

CO6. Apply the biotechnology techniques in the fields of medicine, diagnostics, pharmaceutical industry and Agriculture

Unit l: Immunology- Basic concepts: Antigens and Antibodies

1.1. Basic concepts of Immunology. Cells , Primary and secondary organs of immune system

1.2. Types of immunity- innate and acquired

1.3. Structure, function and types of antigens and antibodies. Epitopes, Haptens, adjuvants

Antigen-antibody reactions.

1.4. T cell and B cell activation. Monoclonal antibodies and their production

Unit lI: Working of an Immune system :

2.1. Structure and functions of Major histocompatibility complex.

2.2. Basic properties and functions of Cytokines, Interferons and Complement proteins.

2.3. Humoral and cell mediated immunity.

2.4. Types of Hyper sensitivity, concepts of autoimmunity and immunodeficiency.

UNIT lll: Animal Biotechnology

3.1. Concept and scope of Animl Biotechnology.

3.2 .Cloning vectors – Plasmids, Cosmids , Lamba bacteriophage, YAC

3.3. Cloning – Cloning methods (cell, animal and gene cloning)

3.4. Animal cell culture- Equipment and materials for animal cell culture, and applications.

UNIT lV: Animal Biotechnology and Genetically modified organisms

4.1. Recombinant DNA technology and its application.

4.2.Transgenesis- Methods of Transgenesis. Application of transgenic animals in biotechnology

4.3. Stem cells- types and their applications.

4.4. Introduction to vaccines and types of vaccines.

B.Sc. III Year PRACTICAL SYLLABUS

SEMESTER - V, DSC - II

Paper – VII

IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Periods: 30 **Max. Marks: 50**

I. Immunology

1. Identification of Blood groups

2. Histological study of spleen, thymus and lymph nodes (through prepared slides)

3. Enumeration of RBC & WBC from a given blood sample

4. Enumeration of Differential count of WBC from a given blood sample

5. Demonstration of

a. ELISA b. Immunoelectrophoresis

II. Animal Biotechnology

1. Study the following techniques through photographs / virtual lab

a. Southern blotting

b. Western blotting

c. DNA sequencing (Sanger's method)

d. DNA finger printing

e. Identification of Vectors

f. Identification of Transgenic animals

2. PCR demonstration /virtual lab

- Laboratory Record work shall be submitted at the time of practical examination
- Computer aided techniques should be adopted as per UGC guide lines.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
Semester - Vl , DSE- ll (A) - PAPER- Vlll
AQUATIC BIOLOGY

Periods: 60 **Max. Marks: 75**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Knowledge about the various types of Aquatic Biomes

CO2. Understood the physicochemical characteristics of different fresh water bodies.

CO3. Learn about the origin, diversity and different ecological aspects of fresh water bodies

CO4. In depth knowledge regarding the various adaptations of Marine organisms

CO5. Apply the concepts of Aquatic Biology in Management and Conservation of Aquatic resources

UNIT – I Aquatic Biomes (15 periods)

1.1 Brief introduction of the aquatic biomes
1.2 Freshwater ecosystem (lakes, wetlands, streams and rivers),
1.3 Estuaries, intertidal zones,
1.4 Oceanic pelagic zone, marine benthic zone.

UNIT – II Fresh Water Biology (15 periods)

2.1 Coral reefs
2.2 Lakes: Origin and classification of lakes
2.3 Lake as an Ecosystem, Lake morphometry
2.4 Physico-chemical Characteristics of fresh water bodies: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity: dissolved gases
(Oxygen, Carbon dioxide).

UNIT – III Marine Biology (15 periods)

3.1 Nutrient Cycles and Lakes- Nitrogen, Sulphur and Phosphorous.
3.2 Streams: Different stages of stream development, Physico-chemical environment, adaptation of hill stream fishes.
3.3 Salinity and density of sea water; Continental shelf; Adaptation of deep sea organisms; Sea weeds.
3.4 Eutrophication

UNIT – IV Management of Aquatic Resources (15 periods)

4.1 Aquatic pollution - Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills,
4.2 Management and conservation
4.3 Water pollution acts of India
4.4 Sewage treatment and water quality assessment – BO D and COD

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD.

AUTONOMOUS (CBCS)

DSE- ll (A)- PAPER- Vlll

Semester Vl Practical Syllabus

AQUATIC BIOLOGY

Periods: 30 **Max.Marks.: 50**

1. Study of the topography of a lake

2. Physico-Chemical and biological analysis of a lake Physico-Chemical analysis of water - O2, CO2, BOD, COD

Biological– Zooplanktons – Identification and population density of Zooplanktons of a lake.

3. Determination of - Turbidity / transparency, Dissolved Oxygen, Free Carbon dioxide, Alkalinity (carbonates & bicarbonates) in water collected from a nearby lake / water body.

4. Instruments used in limnology (secchi disc, van dorn bottle, conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.

5. A Project Report on a visit to a Sewage treatment plant / Marine bioreserve/Fisheries Institutes.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.

SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21

V - SEMESTER

Generic Elective- I, Paper – I

NUTRITION AND DIETETICS

Periods: 30 **Max. Marks: 50**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Understand the importance of the good Nutrition and nutritional requirements in different kinds of people.

CO2. Understand the importance of balanced diet and benefits of good food habits.

CO3. Learn about the diet Obesity and important aspects of diet therapy.

CO4. Assess the nutritive values of different food materials.

CO5. Learn about improper food intake and the consequent health disorders.

UNIT – I **(15 Periods)**

1.1. Nutrition of children, pregnant and lactating mothers.
1.2. Diet obesity and underweight, Principals of diet therapy.
1.3. Balanced diet and nutritional disorders.
1.4. Food allergy, food habits- health effects.

UNIT – II **(15 Periods)**

2.1. Basic Macronutrients and Micronutrients.
2.2 Vitamins and Minerals, Significance of Water and fibre.
2.3 Nutritive value of Cereals, Grains, Fruits and Vegetables.
2.4. Malnutrition and their effects.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
VI - SEMESTER
Generic Elective – II, Paper – II

CLINICAL SCIENCE

Periods: 30 **Max. Marks: 50**

COURSE OUTCOMES

After completion of the course the student is able to:

CO1. Learn about the Composition, functions and types of Blood groups

CO2. Understand the importance the process of Coagulation.
CO3. Knowledge about the different blood related disorders n human beings.
CO4. Understand the components involved in the immune system.
CO5. Learn about antibodies and antigens and their role in several health disorders.

UNIT – I: HAEMATOLOGY **(15 Periods)**

1.1 Introduction of Haematology; Structure, Composition and functions of blood;

Origin of blood cells (RBC, WBC,PLATELETS)

1.2 Blood coagulation and theories of blood coagulation, anticoagulants

1.3 Blood groups and Rh factor; Blood Transfusion and Blood Banking

1.4 Blood associated disorders – Anaemia, Leucopaenia, Leucocytosis, Leukaemia and Haemophilia

UNIT – ll: IMMUNOLOGY **(15 Periods)**

2.1. Types of Immunity – Innate and Acquired; Antigens and Antibodies

2.2. Immunologlobulins – Classifications and significance; Complement system.

2.3. Lymphatic system and Lymphoid organs – Spleen, Thymus, Lymph nodes.

2.4. T-cells, B-cells and Macrophages.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21
Semester – IV
Skill Enhancement Course-II – Vermiculture and Vermicomposting

PERIODS: 30 **MAX. MARKS: 50**
NO. OF CREDITS: 2

COURSE OUTCOMES

After completion of the course the student is able to:
CO 1 Knowledge of composting
CO 2 Describe the decomposing process and be able to compost in a limited space .
CO 3 Apply the Knowledge to get self employment,

CO 4 They can also generate employment for others,
CO 5 They will also turn towards organic farming
CO 6 Analyse the ways to maintain the environment pollution free
CO 7 Knowledge of biodiversity of local earthworms.

UNIT: I **(15 periods)**

1.1 Scope of Vermi-technology- Vermiculture and Vermi composting – difference between Vermiculture and Vermi composting –
1.2 Earthworm diversity – Ecological groups of earthworms, biology of composting earthworms – Eoisena foeitida, Eudrilus lugeniae.
1.3 Soil – Physical, chemical and biological features
1.4 Types small and large scale pit method, heap method.

UNIT: II **(15 periods)**

2.1. Vermiculture techniques – Vermi culture process – site selection - Selection and collection of species.
2.2. Essential parameters for Vermi culture – bedding. Methods of harvesting worms general manual methods, self harvesting method, mechanical method
2.3. Nutritive value of Vermi compost, storing and packing of compost
2.4. Applications of Vermi-composting.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21

Semester – III
Skill Enhancement Course-I
Paper – AQUACULTURE

PERIODS: 30 **MAX. MARKS: 50**
NO. OF CREDITS: 2

COURSE OUTCOMES

After completion of the course the student is able to:

CO 1 Describe the fisheries and fishery industries.
CO 2 Understand the various types and methods of aquaculture practices.
CO 3 Understand the control and management of diseases of important fishes.
CO 4 Apply the modern techniques and methods of post harvest technology .
CO 5 Attained knowledge about important cultivable fin fishes, shell fishes and importance of value added fishery products

UNIT-I **15 periods**

1.1 Introduction and types of fisheries

1.2 Fishery resources- fresh water, brackish water and marine water
1.3 Construction and Management of fish pond
1.4 Fishing crafts and fishing gears.

1.5 Hatchery design, water quality and management

UNIT-II **15 periods**

2.1. Induced breeding-importance of induced breeding

2.2 Seed production, Seed transport and Seed stocking

2.3 Fish products-primary and secondary products.

2.4 Common diseases - viruses, Bacteria and fungi.

2.5 Post harvest technology-preservation method of fishes

GOVERNMENT DEGREE COLLEGE FOR WOMEN (A), BEGUMPET, HYDERABAD.
SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21

B.SC. III YEAR VI – SEMESTER
SEC-IV
PERSPECTIVES OF FOOD SAFETY IN INDIA

PERIODS: 30 **MAX. MARKS: 50**
NO. OF CREDITS: 2

COURSE OUTCOMES

After completion of the course the student is able to:

CO 1 Understand the various aspects of food safety and quality control

CO 2 Practice Hygiene and Sanitation

CO 3 Knowledge about selection and purchase of food

CO 4 Detect food pathogens, aflatoxin, synthetic color, artificial sweeteners and preservatives by suitable methods and equipment.

UNIT1. FOOD SAFETY AND QUALITY CONTROL **15 periods**

1.1Selecting and purchasing food, Understanding food labels

1.2Storing raw foods and cooked foods

1.3Definition of food adulteration and common adulterants present in food

UNIT2. HYGIENE AND SANITATION **15 periods**

2.1 Definition of hygiene and sanitation

2.2 Personal hygiene of food Handler

2.3 Pest control and garbage disposal

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYDERABAD.

(AUTONOMOUS)

SYLLABUS FOR B.Sc. ZOOLOGY COURSE (CBCS) 2020-21

B**.SC. III YEAR V – SEMESTER**

SEC-III

PERIODS: 30 **MAX. MARKS: 50**

NO. OF CREDITS: 2

BIO-TECHNIQUES

COURSE OUTCOMES

After completion of the course the student is able to:
CO 1 Learn about the various tools and instrumentation used in a biological laboratory

CO 2 Knowledge about the different laboratory techniques

CO 3 Understand the various concepts involved in the Biotechniques

CO 4 Apply this Knowledge to detect and identify solutions in biological research.

UNIT1: Basic requirements in a biological laboratory **15 periods**

1.1 Microscopy
1.2 Bioreactor
1.3 Hot plate stirrer
1.4 Ph meter
1.5 Spectrophotometer

UNIT2: Laboratory Techniques **15 periods**

2.1 Staining
2.2 Centrifugation
2.3 Chromatography
2.4 Electrophoresis
2.5 PCR