

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

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 &NUTRITION	GE	4	4
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)	

SEMESTER 1 -BASICS OF BIOCHEMISTRY

COURSE CODE : AN 101

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

COURSE OUTCOMES

Unit 1: Introduction to Nutrition & Carbohydrates -

CO1: 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 -

CO3: 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

CO5: 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

CO7: 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
COURSE CODE : AN 101

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

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 CODE : AN 201

COURSE OUTCOMES

Unit 1: Vitamins-

CO1: 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

CO3: 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.

Unit 3:Water balance and Electrolyte balance

CO5: 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 Hormones

CO7: Understand Role of Enzymes human physiology

CO 8: Understand Role of Hormones in human physiology

I YEAR II SEMESTER
COURSE CODE : AN 201 DISCIPLINE SPECIFIC COURSE
IB- (DSC IB)

NUTRITIONAL BIOCHEMISTRY

CREDITS 4

60 HOUR
20 HOURS

Unit I- VITAMINS

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.

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

II. 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

COURSE CODE : AN 301

FOOD SCIENCE & TECHNOLOGY

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

COURSE OUTCOMES

Unit 1: Basics of Food Science, Cereals & Millets

CO1: Understand the role of food in human nutrition and. Learn various cooking techniques and how to minimize nutritional loss while cooking.

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

CO5: 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

CO7: 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)
COURSE CODE: AN301

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 of milk, role in cookery.
- 2.4 Different types of Fermented & non-fermented milk products.
- 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, polyphenols, 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

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- AN301, SEC-1

FOOD SERVICE MANAGEMENT

300/SEC/E

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 management.

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

III-SEMESTER
PAPER- 300/SEC/E 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

COURSE CODE : AN 401

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

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 Preschoolers, 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.

B.SC. II YEAR & IV-SEMESTER

COURSE CODE : AN 401

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

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

B.SC. II YEAR & IV -SEMESTER
400/SEC/E

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.

