

**GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)**

**BEGUMPET, HYDERABAD-16**

**Affiliated To Osmania University, Re-Accredited With 'B+' Grade by NAAC**



**Courses Syllabus for the academic year 2015-16**

<b>Subject</b>	<b>Pages</b>
Commerce	1-53
Mathematics	54-65
Statistics	66-81
Computer Science	82-99
Botany	100-115
Zoology	116-136
Chemistry	137-189
MicroBiology	190-203
Biotechnology	204-218
Telugu	219-222
English	223-226
Hindi	227-230
Sanskrit	231-235
Economics	236-243
Political Science	244-250
Public Administration	251-258
Computer Applications	259-269
Mass Communications and Journalism	270-277
Communicative English	278-282

# Commerce

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYD-16  
(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, TAX PROCEDURES AND PRACTICES & ADVERTISING, SALES  
PROMOTION AND SALES MANAGEMENT)  
SEMESTER - I  
FINANCIAL ACCOUNTING - I

MAX MARKS: 50(30T+10I+10P)

TIME: 2 1/2HRS

PPW: 6(2+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

**Objectives:**

1. To make the students acquire the conceptual knowledge of accounting.
2. To equip the students with the knowledge of accounting process and preparation of final accounts.
3. To develop the skills of recording financial transactions and preparation of reports using computers.

**UNIT-I: INTRODUCTION TO ACCOUNTING:**

Need for Accounting - Definition, features, objectives, functions, systems, bases and scope of accounting - Book keeping and Accounting - Branches of Accounting - Advantages and limitations - Basic terminology used. Accounting concepts and conventions - Accounting Process - Accounting cycle - Accounting equation.  
**Computer lab work:** Computerized Accounting: Meaning and Features - Advantages and disadvantages of Computerized Accounting - Creating of an organization

**UNIT - II: JOURNALISING, POSTING TO LEDGERS:**

- Rules of double entry book keeping Classification of Accounts - Identification of financial transactions. Journalising, Ledger - Posting to ledgers and balancing of ledger accounts.
- **Computer lab work:** Grouping of accounts - Creation of accounts - Creation of inventory - Creation of stock groups, stock categories, units of measurement, stock items - Entering of financial transactions - Types of vouchers - Voucher entry - Editing and deleting of vouchers - Voucher numbering - Customization of vouchers.

**UNIT-III: SUBSIDIARY BOOKS:**

Sub Division of Journal: Preparation of Subsidiary Books including different types of cashbooks: Simple cash book, cash book with cash and discount columns, cashbook with cash, discount and bank columns, cashbook with cash and bank columns and petty cash book.

**Computer lab work:** Preparation of sales register, purchase register, journal proper, debit note register, credit note register and different cash books including interest and discount transactions using computers.

**UNIT - IV: BANK RECONCILIATION STATEMENT:**

Bank Reconciliation Statement: Need - Reasons for difference between cashbook and pass book balances - Problems on favourable and over draft balances - Ascertainment of correct cash book balance.

**Computer lab work:** Preparation of bank reconciliation statement, using computers.

**UNIT - V: TRIAL BALANCE:** Trial Balance: Meaning, objectives, methods of preparation.

**Computer lab work:** Preparation of trial balance

**ACCOUNTING PACKAGES: WINGS, TALLY, FOCUS.**

**SUGGESTED READINGS:**

1. Financial Accounting- A Dynamic Approach: Bhattacharya, PHI
2. Accountancy-I: Haneef and Mukherjee, Tata Mcgraw Hill Co.
3. Principles & Practice of Accounting: R.L.Gupta & V.K.Gupta, Sulthan Chand
4. Accountancy-I: S.P. Jain & K.L Narang, Kalyani Publishers
5. Accountancy-I: Tulasian, Tata Mcgraw Hill Co
6. Advanced Accountancy: Arulanandam, Himalaya publishers
7. Wings, Tally, Focus - Accounting Packages, BPB Publications
8. Manual provided by Wings, Tally solutions and Focus (Accounting packages)
9. Financial Accounting: Ashok Bannerjee- Excel Books

**SUGGESTED MAGAZINE:** Indian journal of Accounting

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**GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYD-16**  
(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
**B.COM I YEAR (GENERAL)**  
**SEMESTER - I**  
**BUSINESS ECONOMICS - I**

**MAX MARKS: 50T(30T+10I+10P)**

**PPW: 4(3+1)HRS (3 THEORY+2 COMMERCE LAB SESSIONS)**

**TIME: 2 ½ HRS**

**Paper Code No:102**

**NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMMERCE LAB HOURS)**

**Objective:** To facilitate the students to learn the concepts of economics and apply them in real life situations.

**Unit - I: Introduction:** Economic and Non - Economic Activities - Nature and scope of Business Economics - Micro and macro economics - Positive and normative - Inductive and deductive approaches - Reading of graphs - Concept of slope.

**Lab Work:** The students are expected to distinguish between economic concepts

**Unit - II: Utility and Demand Analysis:** Utility: Cardinal and ordinal utility - Law of diminishing marginal utility - Law of Equi-marginal Utility. Demand: Meaning - Individual demand - Law of demand - Properties of demand curve - Income effect and substitution effect - Exceptions to the law of demand - Individual demand and market demand - Demand function - Determinants of individual demand and market demand vs. movement along a demand curve.

**Lab Work:** The Students are expected to compute various utilities and to draw the various demand curves.

**Unit - III: Elasticity of Demand:** Elasticity of demand - price elasticity-meaning and measurement-price elasticity and total revenue of a firm-income elasticity-classification of goods based on income elasticity-cross elasticity-classification of goods into substitutes and complements - concept of consumer surplus.

**Lab Work:** The students must be in a position to differentiate different degrees of elasticity of demand based on the shape of the demand curve. The students must be taught how to compute the degree of elasticity of demand under various methods. They should be able to know the degree of elasticity of demand for necessities, luxuries and neutral goods. The students are expected to give examples for goods that are substitutes and complementary goods. They should be taught how to ascertain consumer's surplus given the relevant data.

**Unit - IV: Supply and Costs:** Supply - law of supply - determinants of supply - market equilibrium - cost concepts - cost function short - run and long-run costs.

**Lab Work:** The students are expected to draw supply curves, various costs and revenue curves and compute costs.

**Unit - V: Production:** Scale of production- economies and diseconomies of scale - Factors of production - production function - Distinction between short - run and long - run - production with one variable input - Relationship between total, marginal, and average production functions- Law of variable proportion- production with two variable inputs- Isoquant - isocost technique of maximization of output, minimization of cost and maximization of profit.

**Lab Work:** The students must know the relationship between total, marginal and average product curves. They should be able to draw isocost and isoquant curves

**Suggested Readings:**

1. Business Economics: Manab Adhikary - 2nd. Edition; Excel Books.
2. Paul A Samuelson: Economics
3. Slonier & Hague: A Test Book of Economic Theory
4. I.C.Dhingra: Business Economics
5. KPM Sundaram: Micro Economics
6. Pallwar: Economics Environment of Business. PHI
7. Deepashree: Business Economics, Himalaya
8. Mithani & Murthy: Business Economics, Himalay
9. H.L Ahuja: Business Economics, S.Chand
10. Mankiw: Principles of Economics, Cengage
11. M.L. Seth: International Economics
12. Joel Dean: Managerial Economics
13. Raj Agarwal: International Trade
14. Internet Websites: WTO, GDP, Fiscal policy, Balance of payments, Balance of trade, International trade.

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B.COM I YEAR

(GENERAL, COMPUTER APPLICATIONS, TAX PROCEDURES AND PRACTICES & ADVERTISING, SALES  
PROMOTION AND SALES MANAGEMENT)

SEMESTER -I

BUSINESS ORGANISATION

MAX MARKS: 50T(30T+10I+10P)

TIME: 2 1/2HRS

PPW: 5(4+1)HRS:(4 THEORY+2 COMMERCE LAB SESSIONS)

Paper Code No:103

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMMERCE LAB SESSIONS)

**Objective:**

1. To acquaint the students with the basics of Commerce and Business; concepts and functions of Business Organization and provide them practical exposure of entrepreneurial role in business using Commerce lab work and assignments.
2. To acquaint the students with the Principles, functions and practice of management and provide them practical exposure giving stories of success/failure businessmen.

**Unit -I: Fundamental Concepts:**

Concepts: Business, trade, industry and commerce – Business: Features of business – Trade: Classification, Aids to Trade – Industry: Classification –Commerce – Relationship between trade, industry and commerce – Business Organization: Concept - Functions of Business.

**Unit - II : Entrepreneur:**

Entrepreneur: Meaning - Characteristics of Entrepreneurs – Types of Entrepreneurs- Functions of an entrepreneur - Steps to start Enterprise – Sources of finance: Long Term, Short Term.

**Lab Work:** The students should go through and present case studies of entrepreneurs – Success and failure.

**Unit - III: Forms of Organization, Sole Proprietorship:**

Business Organization: Forms of Business Organization – Classification – Factors influencing the choice of suitable form of organization - Sole Proprietorship: Meaning – Characteristics – Advantages & Disadvantages – Suitability.

**Unit - IV: Partnership and Joint Hindu Family:** Meaning – Characteristics – Kinds of partners - Registration of partnership – Partnership deed – Rights and obligations of partners. Joint Hindu Family Business: Characteristics – Advantages and limitations.

**Lab Work:** The students are expected to go through partnership deed and prepare a simple partnership deed.

**Unit - V: Joint Stock Company :**

Joint Stock Company: Meaning – Characteristics – Advantages – Kinds of Companies – Differences between private and public companies – Promotion of a Company Promotion Stages - Promoters Characteristics. Registration of a company – Capital subscription – Commencement of Business – Preparation of Important documents Memorandum of Association – significance , clauses - Articles of Association- contents – Prospectus : Contents - Statement in lieu of Prospectus.

**Lab Work:** The students are expected to know preparation of memorandum of association, articles of association and prospectus. As a group they are expected to prepare a model prospectus. The students are also expected to know the formalities of registration of a company including documents.

The students are expected to prepare feasibility report/ viability report to start a new Business/ to expand an existing business.

**Suggested Readings:**

1. Govindarajan and Natarajan: Principles of Management, PHI
2. Bhushan Y K: Business Organization and Management, Sultan Chand
3. RK Sharma and Shashi K.Gupta: Industrial Organization and Management, Kalyani
4. Shererkar etal: Business Organization and Management, Himalaya
5. Satyraj & Parthasarathy: Management – Text and Cases, PHI
6. Rao VSP: Management, Excel
7. Gupta CB: Entrepreneurship Development in India, Sultan Chand
8. Gupta: Principles of Management, PHI
9. James F. Stoner: Management, PHI
10. Tapash: Business Organisation & Management, Tata

**Suggested Magazines:**

1. Business India 2. Business Today
3. Yojana (Telugu & English) 4. Indian Journal of Commerce 6. Indian Journal of Accounting.

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B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -I  
With effect from Academic Year 2012-2013  
FUNDAMENTALS OF INFORMATION TECHNOLOGY- I

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

Paper Code No:104

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I: INTRODUCTION TO COMPUTERS:**

Definition, characteristics and limitations of computers - Elements of computers - Hardware - CPU- Primary and secondary memory- Input and output devices. It enabled -BPO, KPO, Call centers.

**UNIT - II:MODERN COMMUNICATIONS:**

Communications- FAX, Voice mail, and information services- Email- Creation of mail id- Group communication- Teleconferencing- Video conferencing - File exchange - Bandwidth- Modem - Network Topologies- Network types LAN, MAN, WAN, and other architecture - Dial up access.

**UNIT-III:OPERATING SYSTEM:**

Operating systems Meaning, Definition, Functions and Types of operating system - Booting process - Disk operating system Internal and External commands - Wild card characters.

**UNIT - IV: WINDOWS OPERATING SYSTEM:**

Desktop, Start menu, Control panel, Windows Accessories, Computer Virus, Cryptology. Multimedia: Maning, Purpose, usage and application - Images graphics, Songs and music- Video presentation devices- Multimedia on web.

**UNIT - V: MS Office-I MS Word**

Word Processing: Meaning and features of word processing - Advantages and applications of word processing- Parts of Ms Word application window toolbars - Creating, saving and closing a document - Operating and editing a document - Moving and copying text and paragraph formatting, applying bullets and numbering - Find and Replace - Insertion of objects, Date, time, headers and footer and page break.

Mail-merge: Meaning, purpose and advantages- Creating merged letters, Mailing lables envelops and catalogs- Working with table- Format painter - Auto correct - Spelling and Grammar checking - Graphics, Templates and Wizards.

LabWork: MS DOS, WINDOWS, WORD.

**SUGGESTED READINGS:**

1. Introduction to information technology: Rajaraman, PHI
2. Fundamentals of Computers: V.SRinivas, Kalyani
3. E-commerce:CSV Murthy, Himalaya
4. MS Office: Sanjay saxsena
5. Fundamentals of information Technology: Dr.K.Kiran Kumar, Laysa.

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B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -I  
With effect from Academic Year 2012-2013  
BUSINESS INFORMATION SYSTEM- I

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(4 THEORY+2COMPUTER LAB SESSIONS)  
Paper Code No:102

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

**Objective:** To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I:**

Introduction- MIS Business and Technology Trends, Management and Decision levels.

**UNIT - II:**

Productivity and Business operations. Networks and telecommunications, Network functions, Components of a network, Network structure, Global Telecommunication.

**UNIT-III:**

Problem Solving- system approach, object oriented design, solving business problems.

**UNIT - IV:**

Operations and Transactions- Complex Decision and expert systems- Specialized problems.

**UNIT - V:**

Decision Support systems (DSS) and Expert systems, Building Expert systems, Additional Specialized problems, Decision levels, Data capture, Data quality roles of accounting, Transaction Processing.

**LabWork:**

MS-EXCEL MS-ACCESS

**SUGGESTED READING:**

Gerald v.Post David L.Anderson- Management Information System-  
Solving Business Problems with Information Technology, McGraw hill 1997.

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B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -I  
With effect from Academic Year 2012-2013  
FUNDAMENTALS OF "C"- I

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

Paper Code No:105

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I:**

Fundamentals of 'c' C program: Introduction, History, Importance, Basic structure, writing and executing a C program, Pre- Processors in "C"

**UNIT - II:**

Data Types and I/O operations : Keywords, Constants, Variables, Scope and life of a variable, Data types, Storage classes, Reading a character or values, Writing a character or value, formatted I/O- Input and Output operations.

**UNIT-III:**

Operators & Expressions: Introduction, Operators (Arithmetic, Relational, Logical, Assignment, Conditional and special operators), Expressions (Arithmetic, Evaluation), Type conversions, sample programs.

**UNIT - IV:**

Control Flow (Branching & Looping): Introduction, If statements, If else statements, Switch statements, Conditional Statements, While Statements, Do statements, For statements, Sample Programs.

**UNIT - V:**

Arrays: Introduction, Defining an array, initializing an array, one-dimensional array, Two dimensional array, Dynamic array, Sample programs.

**LabWork:**

Practical Problems of C

**SUGGESTED READINGS:**

1. Computing fundamentals and c Programming: Balaguruswamy, Tata
2. Exploring C: Yashwantkanetkar, BPB Publications.
3. Mastering C: K R Venugopal, S R Prasad
4. Let us C: Yashwantkanetkar.

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(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR(Vocational)  
(TAX PROCEDURES AND PRACTICES)  
SEMESTER -I  
INDIAN TAX SYSTEM & INCOME TAX LAW - I

MAX MARKS: 50(30T+10I+10I)

TIME: 2 1/2HRS

PPW: 5(4+1)HRS:(4THEORY+1COMPUTER LAB SESSIONS)

Paper Code No:102

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

**Objective:** To acquaint the student with the tax system and some aspects of tax law prevalent in India.

**UNIT-I:** Meaning of Tax – Need for tax – Central and State powers of taxation – Types of taxes both direct and indirect and Taxes which are to be imposed by central, state and local governments.(Theory only)

**UNIT – II:** Service Tax & Types of services that are presently taxed – An overview of Income Tax Act, 1961.(Theory only)

**UNIT-III:** Income Tax – Meaning – Previous Year – Assessment year – Person – Income – Agricultural income – Conditions to be satisfied; Incomes which cannot be taxed as agricultural income – Basis of charging Income Tax –Computation of Tax Liability. (Including problems)

**UNIT – IV:**Residential status – Determination of residential status of individual, HUF, companies, Partnership firms and other persons. (Including problems)

**UNIT – V:** One-by-six criteria of taxation as a concept only, Distinction between capital and revenue expenses, incomes & losses. Heads of Income – Salary income –Allowance ( Perquisites) Provident Fund – Deductions from Salary (Including problems)

**LAB:Tally/Wings/Focus**

**Note:** Students can be taught Calculation of Income Tax from Salary Income using Computer Software Packages available with any Chartered Accountant.

**Suggested Readings:**

1. B.B. Lal: Direct Taxes, Konark Publication
2. V.K. Singhania: Direct Taxes, Taxman Publication
3. Girish Ahuja & Ravi Gupta: Systematic approach to Income Tax, Taxman
4. Gour and Narang: Income Tax Law and Practice, Kalyani Publication
5. Dinkar Pagare: Income Tax Law and Practice
6. Bhagawathi Prasad: Direct Taxes, Vishwaprakasham Publication.
7. P.V.Ramana Rao, A. Sudhakar S.Krishnaiah Goud: Elements of Income Tax.

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Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR(Vocational)  
(TAX PROCEDURES AND PRACTICES)  
SEMESTER -I  
CENTRAL SALES TAX AND VALUE ADDED TAX - I

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(4THEORY+2COMPUTER LAB SESSIONS)

Paper Code No:105

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

**UNIT-I:** Taxation objectives – Principles / cannons of Taxation – Direct Vs Indirect Tax – Indirect Tax meaning – Features – Merits and Demerits of Indirect taxation

**UNIT-II:** Historical Background Definitions Business, Dealer, Declared Goods, Place of Business" Registered Dealer.

**UNIT – III:** Sale Price, Turnover - Meaning of Inter State Sale - Sale Outside the State - Sale in the Course of Import or Export (Theory Only).

**UNIT-IV:** Liability to Tax on Inter State Sales - Registration of Dealers - Rates of Tax - Determination of Turnover - Calculation of Sales Tax liability - (Including Problems) –

**UNIT – V:** Levy and Collection of Tax - Offence and Penalties - Declared Goods - Liability in Special Cases - Various Forms prescribed under the C.R.T Act. APVAT.

**Lab: Tally/Wings/Focus**

**Suggested Readings:**

1. V. S. Datey: Indirect Taxes, Taxmann's Publication
2. Krishna Murthy: Sales Tax, Compendium of Sales Tax Cases.
3. N.K.Acharya: Commentary on VAT, Asia Law House.
4. B. Satyanarayana Naidu's: Sales Tax Law in A.P, Asia Law House, Hyderabad.

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Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR(Vocational)  
(ADVERTISING, SALES PROMOTION AND SALES MANAGEMENT)  
SEMESTER -I  
MARKETING COMMUNICATION-I

**MAX MARKS:50(30T+10I+10P)**

**TIME: 2 ½ HRS**

**PPW: 5HRS(4T+1P)(ONE THROARY IS EQUAL TO TWO COMMERCES LAB SESSIONS )**  
Paper Code No:102

**Objective:-** To impart knowledge and develop skills in the students in Marketing Communication.

**Unit-I:** Communication process, elements in the communication Process, common communication platforms with regard to Advertising, Sales Promotion, Public relations, Personal selling, Direct Marketing.

**LAB:** Communication Process And Communication Platform.

**UNIT-II:** Steps involved in developing effective communication, Importance of Communication in Marketing. Barriers to effective communication, overcoming barriers to Marketing Communication.

**LAB:** Effective Communication , Barriers And Their Overcoming To Effective Communication.

**UNIT-III:** Basic Promotional Objectives (Informing, Persuading and Reminding), Stages in product life cycle in relation to Marketing Communication Decisions.

**LAB:** Stages in product life cycle in relation to marketing communication decisions.

**Unit-IV:** Determination of Communication objectives through response Hierarchy Models – AIDA Model, Hierarchy of Effects Models, Innovation Adoption model, Communication Model

**LAB:** Marketing communication models.

**UNIT-V:** Technologies breakthrough(Computer, Fax machines, Cellular phones, Pagers, Mobile services, Wireless services, Internet) its impact on Marketing Communication.

**LAB:** Marketing communication – Technologies break through.

**Note:** All the papers will be handles as to have practical orientation with Indian cases and examples.

**Suggested Readings:**

1. Phillip Kotler: Marketing, Pearson Education, Asia, New Delhi.
2. VS Ramaswamy , S. Namakumari : Marketing management
3. Dr.R.L.Varshney & Dr. S.L. Gupta: Marketing management, an Indian perspective, Sultan Chand & Sons.

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**B.COM I YEAR(Vocational)**  
**(ADVERTISING, SALES PROMOTION AND SALES MANAGEMENT)**  
**SEMESTER -I**  
**ADVERTISING - I**

**MAX MARKS: 50(30T+10I+10P)**

**TIME: 2 ½ HRS**

**PPW: 5HRS(4T+1P)(ONE THEORY IS EQUAL TO TWO COMMERCE LAB SESSIONS)**  
Paper Code No:105

**Objective:** To equip students with finer nuances of Advertising Sales.

**UNIT I: Introduction:** What is Advertising? Importance of Advertising, Role of Advertising in Promotion Mix. Role Function, and Benefits of Advertising.

**LAB: Role of advertising in promotion Mix.**

**UNIT II: Market segmentation:** Market Segmentation & "Market Positioning and Its impact on Advertising decisions Target audience (Consumer advertising & Industrial Advertising) Geographical Coverage (National, Regional, Local, International),

**LAB: Market segmentation.**

**UNIT III: Classification of Advertising based on Media and Aims:** Media used (Print, Electronic, Direct Mail, Outdoor, Miscellaneous), Aims (Primary Demand - Secondary Demand, or Service, Social Messages, Direct Action - Indirect Action).

**Lab: Classification of advertising.**

**UNIT IV: Classification of Advertising based on Objectives :** Objectives (Pioneering advertising, Competitive advertising, Remainder advertising) classified and display advertising, Institution Vs Product advertising.

**Lab: Classification of advertising.**

**UNIT V : Setting of Advertising Programmer:** Steps in Advertising Programmer In terms of 5 Ms of Advertising as Market, Motive, Media, Message & Measurement. Advertising Goals- Various approaches for setting advertising objectives . Approach: DAGMAR (defining Advertising Goals for Measured Advertising Results) Product Life. Lab: Setting of advertising goals, programmer and dagmar casestudy.

**Note:** All the papers will be handled so as to have practical orientation, with Indian cases & examples.

**Suggested Readings:**

1. S.A. Chunnawalla: Advertising Sales and Promotion Management, Himalaya
2. Philip Kotler: Marketing Management, eleventh edition.

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(GENERAL, COMPUTER APPLICATIONS, TAX PROCEDURES AND PRACTICES & ADVERTISING, SALES  
PROMOTION AND SALES MANAGEMENT)  
SEMESTER -II  
FINANCIAL ACCOUNTING - II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 1/2HRS

PPW: 6(5+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

**Objectives:**

1. To make the students acquire the conceptual knowledge of accounting.
2. To equip the students with the knowledge of accounting process and preparation of final accounts.
3. To develop the skills of recording financial transactions and preparation of reports using computers.

**UNIT - I: FINAL ACCOUNTS :**

Final Accounts: Meaning, features, uses and preparation of Manufacturing, Trading Account, Profit & Loss Account and Balance Sheet - Adjusting and Closing entries.

**Computer lab work:**

Preparation of trading, profit and loss account, processing of year ending and closing the books, adjusting and closing entries and balance sheet using computers.

**UNIT - II: RECTIFICATION OF ERRORS :**

Errors and their Rectification: Types of Errors - Rectification before and after preparation of final Accounts - Suspense Account - Effect of Errors on Profit.

**Computer lab work:** Rectification of errors using computers.

**UNIT - III: CONSIGNMENT:**

Consignment - Features, terms used, proforma invoice - Account sale - Delcredere commission - Accounting treatment in the books of the consignor and the consignee - Valuation of consignment stock - Normal and abnormal loss - Invoice of goods at a price higher than the cost price.

**UNIT - IV: JOINT VENTURE:**

Joint venture: Features, differences between joint venture and consignment -Accounting Procedure - Methods of keeping records for joint venture accounts -Methods of recording in co venturers books - Separate set of books method.

**UNIT - V: DEPRECIATION, PROVISIONS AND RESERVES:**

Depreciation: Meaning - Causes - Objects of providing for depreciation -Factors affecting depreciation - Accounting Treatment - Methods of providing depreciation: Straight line method - Diminishing Balance Method.

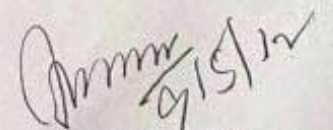
Provisions and Reserves: Reserve Fund - Different Types of Provisions and Reserves.

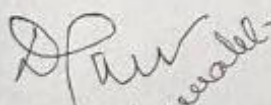
**Accounting packages: Wings, Tally, Focus.**

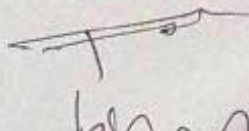
**SUGGESTED READINGS:**

1. Financial Accounting- A Dynamic Approach: Bhattacharya, PHI
2. Accountancy-I: Haneef and Mukherjee, Tata Mcgraw Hill Co.
3. Principles & Practice of Accounting: R.L.Gupta&V.K.Gupta, Sulthan Chand
4. Accountancy-I: S.P. Jain & K.L Narang, Kalyani Publishers
5. Accountancy-I: Tulasian, Tata Mcgraw Hill Co
6. Advanced Accountancy: Arulanandam, Himalaya publishers
7. Wings, Tally, Focus - Accounting Packages, BPB Publications
8. Manual provided by Wings, Tally solutions and Focus (Accounting packages)
9. Financial Accounting: Ashok Bannerjee- Excel Books

**SUGGESTED MAGAZINE:** Indian journal of accounting

  
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**GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYD-16**  
(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
**B.COM I YEAR (GENERAL)**  
**SEMESTER -II**  
**BUSINESS ECONOMICS - II**

**MAX MARKS: 50(30T+10I+10P)**

**TIME: 2 ½ HRS**

**PPW: 4(3+1)HRS:(3 THEORY+1COMMERCE LAB SESSIONS)**

**Paper Code No:202**

**NOTE: (1 THEORY CLASS HOUR IS EQUAL TO 2 COMMERCE LAB HOURS)**

**Objective:** To facilitate the students to learn the concepts of economics and apply them in real life situations.

**Unit - I: Market Structure - Perfect Competition and Monopoly:**

Market structure: Characteristics. Perfect competition: Characteristics - Equilibrium price - Profit maximizing output in the short and long-run - Monopoly: Characteristics - Profit maximizing output in the short and long Run - defects of monopoly.

**Lab Work:** The students are expected to distinguish between concepts and draw curves.

**Unit - II: Market Structure - Monopolistic competition and Oligopoly:**

Monopolistic competition - Characteristics -Product differentiation - Profit maximizing price and output in the short and long-run - Oligopoly: Characteristics - Price rigidity - the kinked demand curve.

**Lab Work:** The students are expected to distinguish between concepts and draw curves.

**Unit - III: Economic Systems and National Income :** Economic systems: Socialism, Mixed economy system- Free market economy -- National Income - Definition - Measurement - GDP meaning, Fiscal deficit.

**Lab Work:** The students should know the formula for ascertaining the GDP under various methods and should be able to distinguish between GDP at factor cost and GDP at market prices. They should know concepts such as intermediate goods, double - counting and transfer payments.

**Unit - VI: International Trade:** Concepts of Economic Liberalization, private, Globalization - Recent Trends; International Trade - Concepts - Comparative Cost Theory - Balance of Trade - Balance of payments.

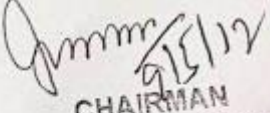
**Lab Work:** The students should be able to distinguish between Liberalization, Privatization and Globalization with appropriate examples.


**Unit - V: WTO and Trade Cycles:** WTO Objectives - Agreements - Functions: Trade cycles - Meaning - Phases - Consequences - Remedies.

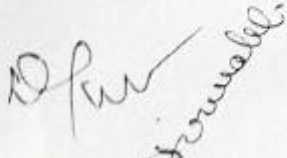
**Lab Work:** The students should be able to identify the phases of a business cycle based on the feature/characteristics of a phase.

**Suggested Readings:**

1. Business Economics: Manab Adhikary - 2nd. Edition; Excel Books.
2. Paul A Samuelson: Economics
3. Stonier & Hague: A Text Book of Economic Theory
4. I.C.Dhingra: Business Economics
5. KPM Sunderam: Micro Economics
6. Pallwar: Economics Environment of Business. PHI
7. Deepashree: Business Economics, Himalaya
8. Mithani & Murthy: Business Economics, Himalaya
9. H.L. Ahuja: Business Economics, S.Chand
10. Mankiw: Principles of Economics, Cengage
11. M.L. Seth: International Economics
12. Joel Dean: Managerial Economics
13. Raj Agarwal: International Trade
14. Nader & Vijayan: Managerial economics
15. Internet Websites: WTO, GDP, Fiscal policy, Balance of payments, Balance of trade, International trade.

  
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Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR

(GENERAL, COMPUTER APPLICATIONS, TAX PROCEDURES AND PRACTICES & ADVERTISING, SALES  
PROMOTION AND SALES MANAGEMENT)  
SEMESTER -II  
BUSINESS MANAGEMENT

MAX MARKS: 50(30T+10I+10P)

PPW: 5(4+1)HRS:(4 THEORY+2 COMMERCE LAB SESSIONS)

TIME: 2 1/2HRS

Paper Code No:203

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMMERCE LAB SESSIONS)

**Objective:**

1. To acquaint the students with the basics of Commerce and Business; concepts and functions of Business Organization and provide them practical exposure of entrepreneurial role in business using Commerce lab work and assignments.
2. To acquaint the students with the Principles, functions and practice of management and provide them practical exposure giving stories of success/failure businessmen.

**Unit -I: Management:**

Management: Meaning - Significance - Management Vs Administration - Levels of Management - Skills of management. Scientific Management: Features - Fayol's Principles of Management.

**Lab work:** The Students are expected to prepare a note on the skills of management and required to manage the organisation of their choice.

**Unit - II: Functions of Management:**

Functions of management - Planning, Organising, Staffing, Directing, Leadership - Leader Vs Manager Traits of Successful leaders and Controlling.

- **Lab work:**Case studies of Successful leaders in business

**Unit -III: Planning:**

Planning: Meaning - Significance - Essentials of a good plan - Advantages and limitations of planning. Types of Plans. Decision making & Steps in Decision making Process.

**Lab work:** Case studies - choice of plan(s)

**Unit - IV Organization:**

Organization: Meaning - Features - the process of organization - Principles of organization - Elements of organizations - Organization chart.

**Lab work:** The students are expected to prepare Organization structure of a few Organizations and based on this knowledge, they should prepare an Organisation structure for a small unit.

**Unit - V: Delegation of authority, Centralisation & Decentralisation:**

Delegation of Authority: Meaning - Elements - Principles - Types - Difficulties in delegation - Guidelines for making delegation effective. Centralization and Decentralization: Meaning - Differences between delegating and decentralization.

**Suggested Readings:**

1. Govindarajan and Natarajan: Principles of Management, PHI
2. Bhushan Y K: Business Organization and Management, Sultan Chand
3. RK Sharma and Shashi K.Gupta: Industrial Organization and Management, Kalyani
4. Sherlekar etal: Business Organization and Management, Himalaya
5. Satyraj & Parthasarathy: Management - Text and Cases, PHI
6. Rao VSP: Management, Excel
7. Gupta CB: Entrepreneurship Development in India, Sultan Chand
8. Gupta: Principles of Management, PHI
9. James F. Stoner: Management, PHI
10. Tapash: Business Organisation & Management, Tata

**Suggested Magazines:**

1. Business India
2. Business Today
3. Yojana (Telugu & English)
4. Indian Journal of Commerce
6. Indian Journal of Accounting.

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Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -II  
With effect from Academic Year 2012-2013  
FUNDAMENTALS OF INFORMATION TECHNOLOGY- II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

Paper Code No:204

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I: MS-EXCEL**

Features of Ms excel- Spreadsheet, workbook, cell pointer, cell address etc. - Parts of Ms Excel window- saving, opening and closing workbook- Insertion and deletion of worksheet- Entering and editing data in worksheet- Cell range - Formatting- Autofill- Formulas and its advantages.

**UNIT - II:MS-EXCEL**

Reference- Relative, Absolute and mixed- Function : Meaning and advantages of functions, Different types of functions available in Excel- Templates- Charts- Graphs- Macros meaning and advantages of macros, Creations, Editing and deletion of macros- Data sorting filtering validation, Consolidation, Grouping, Pivot table and Pivot chart reports.

**UNIT-III: MS-POERPOINT**

Features, Advantages and application of Ms Powerpoint -parts of Ms power point window- Menus and Toolbars- Creating presentations through auto content wizard, Templates Manually- Slide show- saving opening and closing presentation- inserting, editing and deleting slides- Types of slides- side views- Formatting- Insertion of objects and charts in slides- Custom animation and transition.

**UNIT - IV: MS -ACCESS**

Data, Information, database, file record, fields- Templates, advantages and limitations of Ms Access- Application of Ms Access- Parts of Ms Access window- Tables, Forms Queries and Reports- Data Validity Checks- Theory with simple problems).

**UNIT - V: INTERNET & E-COMMERCE**

Service available on internet- www- ISP. E-Commerce Meaning, advantages and limitations, applications of E-commerce- Trading stocks online, Ordering products/journals/books etc. Online Travel and tourism services, Employment placement and job market, internet banking auction, online publishing, advertising- online payment system (including Practicals)

LabWork: MS-EXCEL, MS- POERPOINT- MS ACCESS- INTERNET AND E-COMMERCE

**SUGGESTED READINGS:**

- 1.Introduction to information technology: Rajaraman, PHI
- 2.Fundamentals of Computers: V.Srinivas, Kalyani
- 3.E-commerce:CSV Murthy, Himalaya
- 4.MS Office: Sanjay saxsena
- 5.Fundamentals of information Technology: Dr.K.Kiran Kumar, Laysa.

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B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -II  
With effect from Academic Year 2012-2013  
BUSINESS INFORMATION SYSTEM- II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)

Paper Code No:202

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I:**

Integration of Information- Enterprise resource planning, Customer Relationship Management, Group Decisions, Decisions in Business Area- Accounting- Finance, Marketing, Human resources management Production and design.

**UNIT - II:**

Systems Development - Early methods, system Development Life Cycle, Prototyping, JAD & RAD, object oriented and event driven development.

**UNIT-III:**

Organizing Information System Resources- MIS Role, Centralization and Decentralization, Client -Server Solution.

**UNIT - IV:**

Organizing Business and Systems- Increasing Sales and Reducing costs, E-Commerce options.

**UNIT - V:**

Mobile Commerce, global economy, analysis of Dot- com failures Information Management and Society - Education and Training, Social Interactions.

**LabWork:**

Tally/ Focus/ Wings.

**SUGGESTED READINGS:**

Gerald v.Post David L.Anderson- Management Information System- Solving Business Problems with Information Technology, McGraw hill 1997.

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B.COM I YEAR  
(GENERAL, COMPUTER APPLICATIONS, VOCATIONALS)  
SEMESTER -II  
With effect from Academic Year 2012-2013  
FUNDAMENTALS OF "C"- II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5(4+1)HRS:(5THEORY+2COMPUTER LAB SESSIONS)  
Paper Code No:205

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To impart basic knowledge about computer with application of various packages to Business and Commerce.

**UNIT-I:**

Strings: Introduction, Declaring and initializing string variables, reading and writing strings, string handling functions, sample programs.

**UNIT - II:**

Built - in functions: Mathematical functions, string functions, character functions, data functions, sample programs.

**UNIT-III:**

User - defined functions : Introduction, Need for user defined functions, Elements of functions, Return values and their types, function declaration, function calls, Recursive functions. Sample programs.

**UNIT - IV:**

Structures and unions: Introduction, Declaring structures variables, Accessing structure members, Functions and structures, array of Structures.

**UNIT - V:**

Enumerated Data types, Unions, Introduction to pointers, Passing parameters to functions, sample programs.

**LabWork:**

Practical problems of C

**SUGGESTED READINGS:**

1. Computing fundamentals and c Programming: Balaguruswamy, Tata
2. Exploring C: Yashwantkanetkar, BPB Publications.
3. Mastering C: K R Venugopal, S R Prasad
4. Let us C: Yashwantkanetkar.

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GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET, HYD-16  
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Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR (Vocational)  
(TAX PROCEDURES AND PRACTICES )  
SEMESTER -II  
INDIAN TAX SYSTEM & INCOME TAX LAW - II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 1/2HRS

PPW: 5(4+1)HRS:(4THEORY+1COMPUTER LAB SESSIONS)

Paper Code No:202

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)

Objective: To acquaint the student with the tax system and some aspects of tax law prevalent in India.

**UNIT – I:** House Property: Meaning – Annual Value Let out house – Self Occupied House – Deemed to be let out house. Deductions from annual value – Deemed ownership co-ownership – unrealized rent. Computation of Income from house property(including rebates under section 88) (Theory & problems)

**UNIT–II:** Heads of Income- Income from business and profession. -Differences between Business and Profession – Chargeability – deductions expressly allowed and disallowed – General deduction (Including Problems)

**UNIT – III:** Depreciation: Meaning – Basic Rates – Block of assets – Unabsorbed Depreciation.  
Heads of Incomes: Computations of Capital Gains.(Including Problems)

**UNIT - IV:** Heads of Income – Income from other sources – Interest on Securities – Bond Washing transaction- Dividend on shares – Casual Income – Family Pension – Gifts received and other general incomes – Including Deductions. (Including Problems)

**UNIT – V:** Clubbing of others income- Aggregation of income, set-off and carry forward of losses – Exemptions under Section 10. Deductions from Gross Total Income Under section 80 – Computation of Gross Total Income and Net taxable income and Computation of tax payable after rebates.  
(Assessment of Income for Individuals only).

**LAB:Tally/Wings/Focus**

**Note:** Students can be taught Calculation of Income Tax from Salary Income using Computer Software Packages available with any Chartered Accountant.

**Suggested Readings:**

1. B.B. Lal: Direct Taxes, Konark Publication
2. V.K. Singhania: Direct Taxes, Taxman Publication
3. Girish Ahuja & Ravi Gupta: Systematic approach to Income Tax, Taxman
4. Gour and Narang: Income Tax Law and Practice, Kalyani Publication
5. Dinkar Pagare: Income Tax Law and Practice
6. Bhagawathi Prasad: Direct Taxes, Vishwaprakasham Publication.
7. P.V.Ramana Rao, A. Sudhakar S.Krishnaiah Goud: Elements of Income Tax

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**B.COM I YEAR(Vocational)**  
**(TAX PROCEDURES AND PRACTICES)**  
**SEMESTER -II**  
**CENTRAL SALES TAX AND VALUE ADDED TAX - II**

**MAX MARKS: 50(30T+10I+10P)**

**TIME:2 ½ HRS**

**Paper Code No:205**

**PPW: 5(4+1)HRS:(4THEORY+2 COMPUTER/COMMERCE LAB SESSIONS)**

**NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS)**

**UNIT-I:** Historical background - Statement of Objectives and Reasons - Definitions: Appellate Tribunal, Business, Casual trader, Commercial Tax Officer. Dealer, Exempt Sale, Exempted Turnover, Fair Market Value, Goods, Goods Vehicle, Input Tax, Output Tax, Purchase Price, Place of Business.

**UNIT-II:** Historical background - Statement of Objectives and Reasons - Definitions: Sale, Sale Price, Tax Invoice, Taxable Sale. Total Turnover, Taxable Turnover, Turnover Tax, Turnover Tax Dealer, VAT, VAT Dealer, Works Contract, Year, Zero rated sales, Tax Deferment (Theory Only).

**UNIT-III:** Registration Procedure - Determination of Taxable Turnover and Tax Payable - Act not to apply in certain cases - Treatment of Works Contract. Hire Purchase, License and Lucky Draws - Tax Deduction at Source - Input Tax Credit - Tax Returns, Tax Invoices, Credit Note And Debit Note - Power of State Government to grant refund of Tax. (Theory & Problems).

**UNIT-IV:** Assessment Procedure: Self Assessments, Assessment by authorities, Procedure for Refunds, Interest Payable, Records to be Maintained, Maintenance of Books and Accounts.

**UNIT-V:** Tax deferment, Offences and Penal ties, Appeals and Revisions, Appellate Tribunal, Establishment of Check Posts, Transit Pass, Search, Seizure, Confiscation and Acquisition, Transit Movement, Advance Rulings, Transfer of Business - Various Forms prescribed under APVAT.

**Lab: Tally/Wings/Focus**

**Suggested Readings:**

1. V. S. Datey: Indirect Taxes, Taxmann's Publication
2. Krishna Murthy: Sales Tax, Compendium of Sales Tax Cases.
3. N.K.Acharya: Commentary on VAT, Asia Law House.
4. B. Satyanarayana Naidu's: Sales Tax Law in A.P, Asia Law House, Hyderabad.

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(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR(Vocaitonal)  
(ADVERTISING, SALES PROMOTION AND SALES MANAGEMENT)  
SEMESTER -II  
MARKETING COMMUNICATION-II

MAX MARKS:50(30T+10I+10P)

PPW: 5HRS(4T +1P) )(ONE THREOARY IS EQUAL TO TWO COMMERCES LAB SESSIONS )

TIME: 2 ½ HRS

Paper Code No:202

**Objective:-** To impart knowledge and develop skills in the students in Marketing Communication.

**Unit-I:** Marketing information system – Nature – importance- Components of Marketing Research Concept – Benefits need and components of Marketing Research Steps in conducting Marketing research.

**LAB:**Marketing Research

**Unit-II:** Media Decision, Selection of Communication channels, Personal Channels (Advocate channels, Expert channels, Social channels), Non personal communication channels (Print Media, Broadcast Media, Network Media, Electronic Media, Display Media, Atmosphere and Ambience as Packaged environments that create or reinforce the leanings towards product purchases eg. Ambience of Hotel, law offices, Doctors clinic, Airport etc.,

**LAB:** Selection of communication channels.

**Unit-III:** Events designed to communicate particular messages to target audience as news conferences, grand openings, sports sponsorships to achieve specific communication effects, with target audience. Relative merits and demerits of different media with regard to reach, frequency, impact, costs and other factors.

**LAB:** Events to target audience.

**Unit-IV:** Communication budget and factors affecting marketing communication. Establishing the total marketing communication budget based on – affordable method, Percentage to sale method – competitive parity method – objective and task method.

**LAB:** Communication budget

**Unit-V:** Deciding on the marketing communication mix through five promotional tools as advertising, sales promotion, public relation and publicity, personal selling and direct marketing. Factors influencing the marketing communication mix and managing the integrated marketing communication process.

**LAB:** Marketing communication mix.

**Note:** All the papers will be handles as to have practical orientation with Indian cases and examples.

**Suggested Readings:**

1. Phillip Kotler: Marketing, Pearson Education, Asia, New Delhi.
2. VS Ramaswamy , S. Namakumari : Marketing management.
3. Dr.R.L.Varshney & Dr. S.L. Gupta: Marketing management, an Indian perspective, Sultan Chand & Sons.

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(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
B.COM I YEAR(Vocational)  
(ADVERTISING, SALES PROMOTION AND SALES MANAGEMENT)  
SEMESTER -II  
ADVERTISING - II

MAX MARKS: 50(30T+10I+10P)

TIME: 2 ½ HRS

PPW: 5HRS (4T+1P)(ONE THEORY IS EQUAL TO TWO COMMERCE LAB SESSIONS)  
Paper Code No:205

**Objective:** To equip students with finer nuances of Advertising Sales.

**UNIT I: Setting of Advertising Approach and Model:** Cycle approach Primary & Selective Demand Theory: Informative Advertising. Persuasive advertising, Surrogate Advertising. Planning the test Message.

**LAB:** Advertising Models

**UNIT II: AIDA MODEL:** What to communicate through AIDA Model. Setting of Advertising Budget, Factors' affecting the advertising expenditure in a company.

**LAB:** Advertising Budget case study

**UNIT III : Copywriting:** Advertising Message, preparing an effective advertising copy, elements of a print copy Headings, illustration, Body copy, slogan (Punch line), logos etc, Seal of approval, Role of color elements of a Broadcast copy. Copy of Direct Material. Soap operas and its role in Advertising.

**LAB:** Different elements in advertising a product

**UNIT IV : Creativity :** Creative thinking Convergent Vs Divergent thinking. Idea generation methods: Brainstorming, Synectics, Nominal Grouping, Delhi Techniques, Lateral thinking. Creativity Process (orientation. preparation - analysis - ideation - incubation synthesis. evaluation).

**LAB:** Creative thinking and process in advertising a product

**UNIT V : Creative Strategy:** Advertising appeals (Rational Vs Emotional), Price or Value appeal, Fear or Anger appeal, Sensory appeals, Sex, Love and Social acceptance appeals, Celebrity endorsements, ego appeals, novelty appeals.

**LAB:** Different methods in advertising a product

**Note:** All the papers will be handled so as to have practical orientation, with Indian cases & examples

Suggested Readings:

1. S.A. Chunnawalla: Advertising Sales and Promotion Management, Himalaya
2. Philip Kotler: Marketing Management, eleventh edition.

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Re-Accredited by NAAC with "B" Grade

B.Com II YEAR (GENERAL & COMPUTER APPLICATIONS)

SEMESTER III --- ADVANCED ACCOUNTING I

Applicable from the academic year 2013-2014 onwards

MAX. MARKS: 50 (30T+10I+10P)

Time: 2 1/2 Hrs

PPW: 6(5+1) HRS : (5 THEORY + 2 COMPUTER LAB SESSIONS)

NOTE: 1 THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

Objectives:

1. To appraise the students about the application of accounting knowledge in special business activities.
2. To impart the skills of preparation of final accounts of non-trading concerns.
3. To develop the skills of recording of transactions relating to Branches and Departments manually and using computers.

**UNIT I: Accounts from Incomplete Records (Single Entry):**

Meaning-Features-Books and Accounts maintained- Recording of transactions-Ascertainment of profit (Statement of Affairs Method only).

**UNIT II: Hire Purchase System and Instalment Purchase System:**

Hire Purchase System: Meaning-features-Accounting treatment in the Books of Hire purchaser and Hire Vendor-Default and Repossession.

Instalment Purchase System: Meaning-features -Differences between Hire purchase and Instalment purchase systems- Accounting treatment in the books of Purchaser and Vendor.

**UNIT III: Branch Accounts:**

Meaning -Features-Books of Accounts-Methods of accounting of Dependent Branches: Debtors system, Stock and Debtors System.

Computer Lab work: Recording of transactions relating to Branch accounts using computers.

**UNIT IV: Departmental Accounts:**

Meaning-Features- Need -Basis for allocation of expenses, Treatment of inter-departmental transfer at cost or selling price- Treatment of expenses that cannot be allocated- Preparation of Departmental profit and loss Account.

**UNIT V: Accounting of Non Profit Organisations:**

Non profit entities: Meaning- Features-Differences between Trading and Non trading concerns- Capital and revenue expenditure and income-Concepts of receipt, income, expenditure and payment.

Accounting process of Non profit entities: Receipts and Payments account, Income and Expenditure account and Balance Sheet.

Receipts and Payments Account: Meaning-Features-Accounting treatment of certain items peculiar to Non profit entities- Preparation of Receipts and Payments Account.

Income and Expenditure Account: Meaning -Features-Differences between Receipts and Payments Account And Income and Expenditure Account-Preparation of Income and Expenditure Account.

Balance Sheet-Features-Preparation of Balance Sheet.

**Suggested Readings:**

1. Principles and Practice of Accounting: R.L. Gupta & V.K. Gupta, Sultan Chand & Sons.
2. Accountancy -I : Tulasian, Tata McGraw Hill Co.
3. Advanced Accounting: S.P. Jain & K.L. Narang, Kalyani Publishers
4. Advanced Accountancy: Arulanandam, Himalaya publishers.
5. Advanced Accounting (Vol-I & II) : D. Chandrabose, PHL.
6. Manual of Wings, Tally and Focus Accounting Package

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GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16  
(An Autonomous college of Osmania University)  
Re-Accredited by NAAC with "B" Grade  
B.Com II YEAR(GENERAL & COMPUTER APPLICATIONS)  
SEMESTER IV -- ADVANCED ACCOUNTING II  
Applicable from the academic year 2013-2014 onwards

MAX.MARKS:50(30T+10I+10P)

Time: 2 1/2 Hrs

PPW:6(5+1)HRS : (5THEORY+2 COMPUTER LAB SESSIONS)

NOTE: 1THEORY CLASS HOUR IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

Objectives:

1. To appraise the students about the application of accounting knowledge in special business activities.
2. To impart the skills of preparation of final accounts of Partnership and Companies.
3. To develop the skills of recording of transactions relating to issue of shares and debentures.

**UNIT I: Partnership Accounts:**

Legal provisions in the absence of Partnership Deed-P & L Appropriation Account-Fixed and Fluctuating Capitals-Preparation of Final Accounts.

**UNIT II: Partnership Accounts:**

Admission of a Partner-Treatment of Goodwill,accumulated profits,reevaluation of assets and liabilities,calculation of New profit sharing ratio,adjustment of capitals.

Retirement of a partner- Accounting treatment of retirement of a partner.

Computer lab work: Recording of transactions relating to admission and retirement.

**UNIT III: Partnership Accounts:**

Death of a partner-Accounting treatment of Death of a partner-Insolvency-Garner v/s Murray case-Accounting treatment of insolvency of a partner.

Dissolution of a Partnership firm- Accounting treatment of dissolution of a partnership firm.

Computer lab work: Recording of transactions of death,insolvency and dissolution of partnership firm using computers.

**UNIT IV: Company Accounts: Shares**

Meaning - Features-Kinds of Joint Stock Companies-Types of shares-Differences between Equity shares and Preference shares-Issue of shares at Par, Premium and at Discount-Forfeiture and reissue of forfeited shares-

Presentation of information relating to share capital in the Balance sheet of a Company-Rights Issue(Theory only)

Computer lab work: Recording of transactions relating to issue of shares using computers.

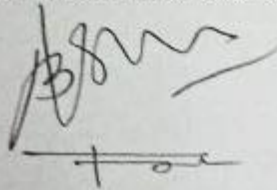
**UNIT V: Company Accounts: Debentures**

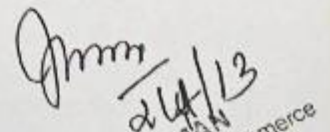
Meaning-Features-Kinds of Debentures-Differences between shares and debentures-Issue and redemption of debentures- redemption out of profits- Sinking fund method-Underwriting of shares.

Computer lab work: Recording of transactions relating to issue and redemption of debentures using computers.

**Suggested Readings:**

1. Principles and Practice of Accounting: R.L. Gupta & V.K.Gupta, Sultan Chand & Sons.
2. Accountancy - I : Tulasian, Tata McGraw Hill Co.
3. Advanced Accounting: S.P.Jain & K.L.Narang, Kalyani Publishers
4. Advanced Accountancy: Arulanandam, Himalaya publishers.
5. Advanced Accounting(Vol-I & II): D. Chandrabose, PHI.
6. Manual of Wings, Tally and Focus Accounting Package.



  
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**GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16**  
(An Autonomous college of Osmania University) - Re-Accredited by NAAC with "B" Grade  
Faculty of Commerce - B.Com II YEAR (GENERAL & COMPUTER APPLICATIONS)  
SEMESTER III - BANKING AND INSURANCE

Applicable from the Academic year 2013-2014 onwards

MAX. MARKS: 50(30T+10I+10P)

Time: 2 1/2 Hrs

PPW: 5(4+1) HRS : (4THEORY+1 COMPUTER LAB SESSIONS)

**Objectives:** To Impart knowledge on Banking and Insurance concept and to gain an insight on Financial Services.

**UNIT I: Banking Systems and its Regulation:**

a. Definition of Bank, Functions of Commercial Banks and Reserve Bank Of India.  
(Lab Work: Form of various accounts and deposits of commercial banks.)

b. Banking System- Branch banking-Unit Banking-Correspondent Banking-Group banking, Deposit banking-Mixed banking and Investment banking. An overview of banking. Banking sector reforms with special reference to Prudential Norms, Capital adequacy norms, Income recognition norms, classification of assets and NPAs. Innovations in Banking-ATM, E-Banking-Credit Cards-Online and Offshore Banking.  
(Lab Work: working and operation of ATM, Credit Cards, E-Banking.)

c. Regional Rural Bank, Co-operative Bank, Micro Finance, Priority Sector Lending, Indigenous Banking, Role of NABARD, Development Financial Institutions-SFC, SIDBI.

**UNIT II: Banker and Customer:**

Banker and Customer definition and their relationship, types of customers and mode of operations, procedure and precaution for opening an account, pass book and its features, Rights, duties and obligations of the payee banker

**UNIT III: Negotiable Instruments Act:**

Promissory note and Bills of exchange and Cheques. Differences between the types of crossing the cheque and consequences of wrongful dishonor, collection of local and upcountry cheque, responsibilities and liabilities of collecting banker and statutory protection to the collecting banker.

(Lab Work: Promissory Notes, B/E, Crossed cheques-various modes)

**UNIT IV: Type of Insurance and its Regulation:**

Definition and meaning of Insurance and Re-Insurance, Principles of Insurance, Kinds of Insurance, Advantages of Insurance, Globalization of Insurance and Insurance sector reform in India. Regulation of insurance in India, Insurance Act 1938 and IRDA 1990.

(Lab Work: Formats of types of Insurance.)

**UNIT V: Life and Non Life Insurance:**

a. Life Insurance: Practical aspects of Life Insurance, procedure for issuing a life insurance policy, issue of duplicate policies, nomination, surrender value, policy loans, assignment, revivals and claims settlement.

(Lab Work: Formats of types of Life Insurance.)

b. Non Life Insurance: Type of products and scope of Fire Insurance, Marine Insurance, Health Insurance, Social Insurance and Rural Insurance.

(Lab Work: Formats of types of Non Life Insurance.)

**Suggested Readings:**

- |                                       |                               |
|---------------------------------------|-------------------------------|
| 1. K.C. Shekar                        | : Banking Theory & Practice   |
| 2. Srivastava                         | : Banking Theory & Practice   |
| 3. A.V. Ranganadha Chary & R.R. Paul  | : Banking & Financial Systems |
| 4. Dr. K.N. Prasad and T. Chandra Das | : Banking & Financial Systems |
| 5. Mithani & Gardon                   | : Banking & Financial Systems |

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Faculty of Commerce

B.Com II year (GENERAL AND COMPUTER APPLICATIONS)

SEMESTER III – BUSINESS STATISTICS – I

Applicable from the academic year 2013-14 onwards

Max.Marks:50(30T+10I+10P)

Time:2 ½ Hrs

PPW:5(4+1)Hrs:(4Theory + 2Computer Lab Sessions)

NOTE: 1Theory Class Hour is equal to 02 Computer /Commerce Lab Hours.

**Objective:**

The objective of this paper is to impart knowledge on the application of statistical tools and techniques in business decision making & use of MS-Excel in interpretation of statistical data.

**UNIT I: Introduction to Statistics:**

Meaning-Definition-Importance and limitations of statistics-Planning of statistical survey-Collection of data-Primary and Secondary data-Sampling(Random and Non-Random)-Census-Schedule and Questionnaire.

**UNIT II: Classification and Presentation of Data:**

Classification of Data-Objectives –Rules-Modes-Frequency Distribution-Tabulation-Diagrammatic presentation- Types of diagrams-Graphic presentation-Types of graphs. (Computer lab work: Diagrammatic and graphic presentation of data using Excel).

**UNIT III: Measures of Central Tendency-I**

Definition-Objectives and Characteristics of measures of central tendency-Types of Averages: Arithmetic Mean, Geometric Mean, Harmonic Mean and their application. (Computer lab work: Calculation of mean using computers.)

**UNIT IV: Measures of Central Tendency-II**

Median-Quartiles-Deciles-Percentiles-Mode and their application. (Computer lab work: Calculation of averages using computers.)

**UNIT V: Measures of Dispersion:**

Meaning-Properties of Dispersion-Range-Quartile Deviation-Mean Deviation-Standard Deviation-Coefficient of Variation.

(Computer lab work: Calculation of Dispersion using Computers.)

**Suggested Readings:**

1. Fundamentals of Statistics: S.C.Gupta
2. Statistical Methods : S.P. Gupta
3. Statistics-Problems and Solutions.V.K.Kapoor
4. Statistics-Theory, Methods and Applications:Sancheti,D.C. & V.K.Kapoor
5. Statistics Made Simple: Sarma,PHI.

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Subject: Taxation-I

Semester -III

Time: 2 ½ Hrs

Periods Per Week: 4(3+1) Hours

Marks: 30T+10I+ 10P

Objective: The objective of this paper is to impart knowledge on the Tax procedure and practice.

### UNIT-I INTRODUCTION

Indian Taxation System- Overview of Direct taxes – Basic concepts (Assessment year – Previous year Assessee – Charge of Income Tax – Income – Gross Total Income Total Income – Tax Liability – Agricultural Income – Difference between Exemption and Deduction – PAN – Capital Receipts Vs Revenue Receipts – Capital Expenditure Vs Revenue Expenditure – Residential status of individuals – General Norms – Incidence of tax (Including Problems) – Incomes exempted from tax.

### UNIT-II INCOME FROM SALARY

Essential norms of Salary Income – Basis of charge – Place of accrual of salary income – Tax treatment of different forms of salary income – Allowances – Perquisites – Valuation of Perquisites – Deductions from salary income – Employees' Provident Fund – Approved Super Annuity Fund – approved Gratuity Fund – Deductions under section 80 C – Relief under section 89 (Problems on Salary Income).

### UNIT-III INCOME FROM HOUSE PROPERTY

Chargeability – Applicability of section 22 in certain typical situations – Computation of Income from Let out house – Income from self occupied house – Special provisions when unrealized rent in realized subsequently – (problems on computation of Property Income).

### UNIT-IV INCOME FROM BUSINESS AND PROFESSION

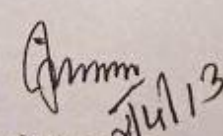
Chargeability – General principles governing assessment of Business Income – Deductions expressly allowed in respect of Expenses of Allowances Amount expressly disallowed under the act. Amount not deductible under section 40 (a) – (Problems on computation of Income Business and Profession).

### UNIT-V INCOME FROM CAPITAL GAINS

Chargeability – Meaning of capital Assets – Types of Capital Assets – Transfer of Capital Gains – Computation of Capital Gain – Full value consideration – Expenditure on transfer – Indexed Cost of Acquisition and Indexed Cost Improvement – Capital Gains exempted from tax – Problems on Computation of Capital Gain.

#### Reference Books:

1. Student guide to income tax : Sighania – Taxman publications
2. Income tax and accounts : H.C. Mehrotra – Sahitya bhavan publications
3. Elements of income tax : Gaur and Narang – Kalyani Publications
4. Direct taxes : Bhagawathi Prasad – Vishwa Prakashan
5. Elements of income tax : P.V. Ramana Rao, A. Sudhakar – National Publishing
6. Elements of income tax : H. Prem raja – Sri Hamsarala Publications.
7. Indirect Taxes : V.K. Sareen & May Sharma, Kalyani – Publishers.
8. AP vat : T.V.R. Satyan Prasad, Asia law house
9. Guide to service tax : P. Veera Reddy, Asia law house
10. Indirect taxes : V.S. Datey – Taxmann Publications

  
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Faculty of Commerce-B.COM II year(COMPUTER APPLICATIONS)  
**SEMESTER III--- RELATIONAL DATABASE MANAGEMENT SYSTEMS-I**

Applicable from the Academic year 2013-2014 onwards

Max.Marks:50(30T+10I+10P)

Time : 2 ½ Hrs

PPW: 5(4+1) HRS : (4 THEORY+1 COMPUTER LAB SESSIONS)

Objective: To impart basic knowledge about Database and its implementation

**UNIT-I:**

Database Systems – Evolution- File Oriented Systems-Database Models database System  
Components-Database Systems in the Organization

**Unit-II-**

- Data sharing Strategic Database Planning-Database and Management Control-
- Risks and Costs and Databases-Database development.

**UNIT-III:**

Database Design-Principles of Conceptual Database Design-  
Conceptual Data Models- Aggregation- Modeling conceptual Objects  
vs. Physical Objects- Relational Data Model

**UNIT-IV:**

Fundamental Concepts-Normalization-Transforming a conceptual model -  
Relational Model- Relational Database Implementation-  
Relational Algebra and Calculus.

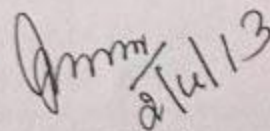
**UNIT-V:**

SQL-Schema and Table Definition-Data Manipulation-  
View Definition Graphical Query Language

Lab Work:Using SQL commands creating Database Schema and Tables

**SUGGESTED READINGS:**

- 1.Modern Database Management: McFadden
  2. An Introduction to Database System:Bipin C.Desai
  - 3.Database Management & Design: Gary Hansen & James. Hansesn.
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Faculty of Commerce - B.Com II YEAR (GENERAL & COMPUTER APPLICATIONS)  
**SEMESTER IV – FINANCIAL SERVICES**

**MAX.MARKS:** 50(30T+10I+10P)

**Time:** 2 1/2 Hrs

**PPW:** 5(4+1) HRS : (4THEORY+1 COMPUTER LAB SESSIONS)

**NOTE:** 1 THEORY CLASS HOUR = 2 COMPUTER/COMMERCE LAB HOURS

**Objective:** To impart knowledge on banking and insurance concepts and on gain an insight On financial services.

**UNIT –I: Introduction to Financial Services:**

Meaning of Financial Services. Structure of Indian Financial System Importance of Financial system for the economic development, Challenges facing the Financial Services Sector, New Financial products and Services Sector, New Financial products and services, Scope of Financial Services. (Lab work: Financial and Banking system charts).

**UNIT –II: Indian Money Market:**

Indian Money Market-Characteristics, Structure Composition, (Call and notice money, market. Treasury bills market, CDs. CPs. Short term bill market. MMEs and DFHD problems and reforms in Indian money market.

(Lab work: Formats of CDs CPs Treasury bills etc)

**UNIT –III: Indian Capital market:**

Indian Capital Market – composition and growth of primary and secondary markets. Differences between primary and secondary markets, capital markets reforms and NBFCs in capital markets. Stock Exchange. BSE, NSE, OTCEL. Online trading and role of SEBI.

(Lab work : Trends of stock market index given in magazines / newspapers)

**UNIT –IV: Financial Intermediaries and Services:**

Financial intermediaries and services: Merchant bankers, Mutual funds, Leasing companies Venture Capital Funds. Forfaiting. Loan Syndication. Factoring. Custodial Services Depository services and Depository Participants.

(Lab work: forms formats and Documentation procedure)

**UNIT –V: Loans and Advances:**

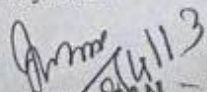
Types of Loans and advances principles of sound lending policies, Credit appraisals of various Forms of loans and advances -- Modes of creating charges – line, pledge. Mortgage and Hypothecation.

(Lab work: Documents required for sanction of loans and advances and the procedure)

**Suggested Readings:**

1. K.C.Shekar
2. Srivastava
3. A.V.Ranganadha Chary & R.R.Paul
4. Dr.K.N.Prasad and T.Chandra Das
5. Mithani & Gardon

- :Banking Theory & Practice
- :Banking Theory & Practice
- :Banking & Financial Systems
- :Banking & Financial Systems
- :Banking & Financial Systems

  
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Faculty of Commerce

B.Com II year (GENERAL AND COMPUTER APPLICATIONS)

SEMESTER IV – BUSINESS STATISTICS –II

Applicable from the academic year 2013-14 onwards

Max.Marks:50(30T+10I+10P)

Time:2 ½ Hrs

PPW:5(4+1)Hrs:(4Theory + 2Computer Lab Sessions)

NOTE: 1Theory Class Hour is equal to 2 Computer /Commerce Lab Hours.

**Objective:**

The objective of this paper is to impart knowledge on the application of statistical tools and techniques in business decision making & use of MS-Excel in interpretation of statistical data.

**UNIT I: Measures of Skewness:**

Meaning-Definition-Karl Pearson's and Bowley's Measures of Skewness-Normal Distribution(Simple Problems).

(Computer lab work:Calculation of Skewness using Computers.)

**UNIT II: Measures of Relation: Correlation**

Meaning-Definition-Uses-Types of Correlation-Karl Pearson's Correlation coefficient-Spearman's Rank Correlation-Probable Error.

(Computer lab work: Calculation of Correlation using Computers).

**UNIT III: Measures of Relation: Regression**

Meaning-Utility of Regression Analysis-Comparison between Correlation and Regression-Regression Equations-Interpretation of Regression Coefficient.

(Computer lab work:Calculation of Regression by using Computers.)

**UNIT IV: Analysis of Time Series:**

Meaning- Utility of Time Series Analysis-Components of Time Series-Measurement of Trend and Seasonal Variations-Utility of Decomposition of Time Series – Decentralisation of Data.

(Computer lab work:Calculation of Trend and Seasonal Variations using Computers).

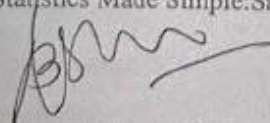
**UNIT V: Analysis of Index Numbers:**

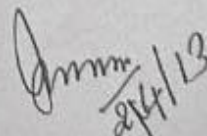
Meaning-Definition -Importance of Index Numbers-Methods of construction of Index numbers-Value Index numbers-Price Index numbers-Quantity Index numbers-Tests of Adequacy of Index numbers-Deflating Index numbers-Cost of Index Numbers-Limitations of Index numbers.

(Computer lab work:Calculation of Index numbers using Computers).

**Suggested Readings:**

1. Fundamentals of Statistics: S.C.Gupta
2. Statistical Methods : S.P. Gupta
3. Statistics-Problems and Solutions.V.K.Kapoor
4. Statistics-Theory, Methods and Applications:Sancheti,D.C. & V.K.Kapoor
5. Statistics Made Simple:Sarma,PHI.



  
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Is accredited by SAAC with B Grade

Faculty of Commerce

B.Com II Year (GENERAL AND COMPUTER APPLICATIONS)

Semester – IV

Applicable from the academic year 2013-14 onwards

**TAXATION – II**

Periods per week: 4(3+1) Hours

Marks: 30T+10I+10P

**OBJECTIVE: TO EQUIP THE STUDENTS WITH THE WORKING KNOWLEDGE OF BOTH DIRECT AND INDIRECT TAXES.**

**Unit-I Income from other sources** – interest on securities. Bond washing transaction. Dividends on shares, casual income, family pension, gifts received and other general incomes including deductions, deemed income. (including problems).

**Deductions from gross total income and rebates.** Clubbing and aggregation of incomes, Set off and carry forward of losses.

**Unit-II Computation of total income and tax liability of individual Assessee.** (including problems). Assessment procedure – Filing of returns, Self – assessment, Regular assessment, Best judgment assessment. Income tax authorities (theory only).

**Lab Work:** filing relevant forms for individual Assessee. Format and filling of form: 16 Format and filling & filing of ITR – 1 & ITR-2.

**Unit-III Wealth Tax** – concepts – computation of wealth (theory only) Wealth tax Act 1957 – Charges of Wealth Tax Valuation Date – Location of Assets – Assets – Meaning – Deemed Assets – Exempted Assets – Net Wealth – Computation of Net Wealth – Valuation of Assets – Return of Wealth and Procedure of Assessment – Time Limit for Completion of Assessment. (Including Problems).

**Unit-IV Indirect taxes:** Customs duty – Chargeability – Important Terms and Definitions – Procedure for imports – Procedure for Exports – Customs Tariff Act – warehousing – Baggage – Stores – Postal Imports – Power of Customs Authorities (Theory only).

**Central Excise** – Chargeability – Meaning of goods and excisable goods – Deemed Manufacture – Manufacturer – Central – Excise Tariff Act – Principles of Classification – Specific duty vs. Advalorem duty – Maximum Retail Sale price – Convent Credit – Registration Procedure. (Theory only).

**Unit-V Value Added Tax (VAT)** – Historical Background – Important Terms and Definitions – Statement of Objects and Reasons – Incidence. Levy and Collection of Tax – (Theory only).

**Service Tax** – Chargeability – An overview of specified taxable services – Registration – Valuation – Convent Credit – (Theory only).

**Reference Books:**

1. Student guide to income tax : Sighania – Taxman publications
2. Income tax and accounts : H.C. Mehrotra – Sahitya bhavan publications
3. Elements of income tax : Gaur and Narang – Kalyani Publications
4. Direct taxes : Bhagawathi Prasad – Vishwa Prakashan
5. Elements of income tax : P.V. Ramana Rao, A. Sudhakar – National Publishing
6. Elements of income tax : H. Prem raja – Sri Hamsarala Publications.
7. Indirect Taxes : V.K. Sareen & May Sharma, Kalyani – Publishers.
8. AP vat : T.V.R. Satyan Prasad, Asia law house
9. Guide to service tax : P. Veera Reddy, Asia law house
10. Indirect taxes : V.S. Datey – Taxmann Publications

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Faculty of Commerce-B.COM II year(COMPUTER APPLICATIONS)  
SEMESTER IV --- RELATIONAL DATABASE MANAGEMENT SYSTEMS-II

Applicable from the Academic year 2013-2014 onwards

Max.Marks:50(30T+10I+10P)

Time : 2 ½ Hrs

PPW: 5(4+1) HRS : (4 THEORY+1 COMPUTER LAB SESSIONS)

**Objective:** To impart basic knowledge about Database and its implementation

**UNIT-I**

Client-Server Databases-Defining Database Tables and Server-  
Server Data Manipulation and Programming-Developing Client Applications  
Physical Database Systems

**UNIT-II:**

Storage Media-Disk Performance Factors-File Organisation-  
Implementing Logical Relationships-logical Data Structures to  
Physical Structures- Secondary Keys Access-

**UNIT-III:**

Database Administration and Control DBA Functions-  
DBA Goals- Database Integrity- Database Security- Database Recovery

**UNIT-IV:**

Distributed Database Systems-Design.- Query Processing-  
Data Integrity Recovery- Client/Server Systems- DBMS Selection  
and Implementation- Information Needs

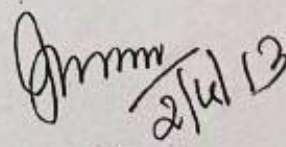
**UNIT-V:**

DBMS Functions and Capabilities-Classifying DBMS feature requirement  
Evaluation Models- Implementation Issues- Case studies of RDBMS  
Package such as ORACLE/MS-SQL Server.

**Lab Work:**Deleting,Updating,Alteration and Retrieval of data,

**SUGGESTED READINGS:**

- 1.Modern Database Management: MeFadden
2. An Introduction to Database System:Bipin C.Desai
- 3.Database Management & Design: Gary Hansen & James. Hansesn.





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Re-accredited by NAAC with "B" Grade  
**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester -V  
**CORPORATE ACCOUNTING I**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives:**

1. To provide the knowledge relating to the Accounting Standards.
2. To enable students to evaluate shares and goodwill.
3. To enable the students to prepare final accounts on Amalgamation.
4. To enable students to prepare final accounts using Accounting Package.

**UNIT I: ACCOUNTING STANDARDS AND VALUATION OF GOODWILL:** Accounting Standards- Need-Importance-An overview of Indian Accounting Standards .(Theory only)  
**Valuation of Goodwill- Need- Methods - Normal Profit Method, Super Profit Method, Capitalization Method (Including problems).**

**UNIT II: VALUATION OF SHARES:** Need for Valuation- Methods of Valuation-Net Assets Method, Yield Basis Method, Fair Value Method (Including problems).

**UNIT III: COMPANY FINAL ACCOUNTS :**Preparation of Company Final Accounts – Provisions relating to preparation of Final Accounts –Profit and Loss Account and Balance Sheet.(Including problems).

**Computer Lab work:** Preparation of final accounts using computers.

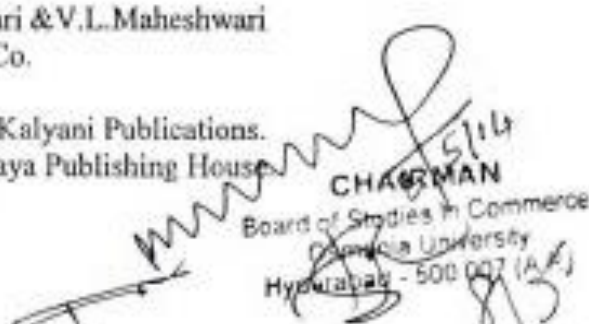
**UNIT IV: ISSUE OF BONUS SHARES AND PROFITS PRIOR TO INCORPORATION:** Issue of Bonus shares-Provisions of Company's Act and SEBI Guidelines - Acquisition of Business and Profits prior to Incorporation – Accounting Treatment (Including Problems)

**UNIT V: AMALGAMATION - I:** Amalgamation in the nature of merger – Calculation of Purchase Consideration – Treatment in the books of Transferor and transferee (As per Accounting Standard 14,Excluding inter company holdings) (Including Problems).

**Lab Work:** Recording of transactions relating to mergers using computers.

**SUGGESTED READINGS:**

1. Advanced Accountancy: R.L.Gupta & Radhaswamy,Sultan Chand & Sons
2. Corporate Accounting : Goyal V.K. Excel Books.
3. Advanced Accountancy(Vol-II) :S.N. Maheshwari &V.L.Maheshwari
4. Accountancy –III: Tulasian, Tata McGraw Hill Co.
5. International Accounting:Das Mohapatra,PHI.
6. Corporate Accounting:S.P.Jain and K.L.Narang,Kalyani Publications.
7. Corporate Accounting :Sakshi Vasudeva, Himalaya Publishing House.

  
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DEPARTMENT OF COMMERCE  
B.Com III YEAR ( General and Computer Applications)  
Semester -VI  
CORPORATE ACCOUNTING-II  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Objectives:**

1. To enable students to prepare final accounts in case of Amalgamation, Internal Reconstruction, Banks and Insurance sector.
2. To enable students to prepare final accounts using Accounting Package.

**UNIT I:AMALGAMATION-II AND INTERNAL RECONSTRUCTION:** Amalgamation in the nature of Purchase -Calculation of Purchase Consideration - Accounting Treatment in the books of transferor and transferee- Internal Reconstruction- Accounting treatment - Preparation of final statements after reconstruction.(Including problems).

**Lab Work:** Recording of transactions relating to Amalgamation and Internal Reconstruction using computers.

**UNIT II: BANK ACCOUNTS-I :** Bank Accounts-Books and Registers to be maintained by Banks-Slip System of posting-Rebate on bills discounted - Schedule of advances- Non -performing Assets-Legal provisions relating to preparation of Profit and Loss Account. (Including problems).

**Lab Work:** Preparation of Bank final Accounts using computers.

**UNIT III:BANK ACCOUNTS-II:** Legal provisions relating to preparation of Balance Sheet.(Including Problems).

**UNIT IV: ACCOUNTS OF LIFE INSURANCE COMPANIES:** Life Insurance Companies-Preparation of Revenue Account-Profit and loss account-Balance sheet and Valuation Balance sheet.(Including problems)

**Lab Work :** Preparation of Revenue Account of Life Insurance Companies using Computers.

**UNIT V:ACCOUNTS OF GENERAL INSURANCE:** Preparation of final accounts with special reference to fire & marine insurance only .(Including problems).

**SUGGESTED READINGS:**

1. Advanced Accountancy: R.L.Gupta & Radhaswamy,Sultan Chand & Sons
2. Corporate Accounting : Goyal V.K. Excel Books.
3. Advanced Accountancy(Vol-II) :S.N. Maheshwari &V.L.Maheshwari
4. Accountancy -III: Tulasian, Tata McGraw Hill Co.
5. International Accounting:Das Mohapatra,PHI
6. Corporate Accounting:S.P.Jain and K.I.Narain,Kanani Publications.
7. Corporate Accounting :Sakshi Vastu, Sakshi Publishing House.

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**GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16**  
( An Autonomous College of Osmania University)  
Re-accredited by NAAC with "B" Grade  
**DEPARTMENT OF COMMERCE**  
B.Com III YEAR ( General )  
Semester -V  
**ADVANCED CORPORATE ACCOUNTING-I**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives:**

1. To enable students to prepare financial statements of Holding and Subsidiary Companies.
2. To enable students to prepare Financial statements of Electricity Companies.
3. To provide the knowledge of Lease Accounting.
4. To enable the students to prepare Final accounts using Accounting Package.

**UNIT I: THE ACCOUNTS OF HOLDING COMPANIES-I:** Nature of Holding Companies-Legal requirements for a holding company-Schedule VI of the Companies Act and Subsidiary Companies-Preparation of Consolidated Balance Sheet-Cancellation of investment account - minority interest-cost of acquiring control or goodwill- capital reserve.(Including problems)

**UNIT II: THE ACCOUNTS OF HOLDING COMPANIES-II:** Preference share capital in subsidiary companies- Debentures in subsidiary companies (Including problems related to the single subsidiary company).

**Lab Work:** Computation of problems using Excel/Accounting package.

**UNIT III: ACCOUNTS OF ELECTRICITY COMPANIES:** Meaning of Double Account System-revenue account and net revenue account- capital account (receipts and expenditure on capital account) and General Balance Sheet. Replacement of an asset. Important provisions of Indian Electricity Act 1910(Including problems).

**UNIT IV: ELECTRICITY SUPPLY ACT 1948 AND THE COMPANIES ACT 1956:** Formats of relevant accounts- calculation of reasonable return and disposal of surplus. Preparation of net revenue account and Balance sheet.(Including problems).

**Lab Work:** Computation of problems using Excel/ Accounting Package.

**UNIT V: LEASE ACCOUNTING -I:** Meaning- Steps -types -Financial evaluation -Provisions of Indian Accounting Standard No.19- Methods of computing lease rentals- advantages and disadvantages - Accounting treatment of Financial Lease. (Including problems).

**Lab work:** Computation of problems using Excel/ Accounting package.

**SUGGESTED READINGS:**

1. R.L.Gupta & M.Radhaswamy: Corporate Accounting., Sultan Chand.
2. M.A.Arulanandam, & K.S. Raman: Advanced Accounting, Himalaya.
3. Tulasian: Advanced Accounting, Tata McGraw Hill Publications.
4. Jain & Narang : Corporate Accounting, Kalyani publications.
5. S.M.Shukla: Advanced Accounting, Sahitya Bhavan.
6. Chandra Bose: Advanced Accounting (Vol-II)PHL.
7. Wood: Frank Wood's Business Accounting (Vol-I) I I/e ,Pearson.

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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General )**  
Semester - VI  
**ADVANCED CORPORATE ACCOUNTING-II**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives :**

1. To enable students to prepare Financial statements in case of Lease Accounting
2. To provide the knowledge of Human Resource Accounting and Social Responsibility Accounting and preparing final accounts using Accounting packages.
3. To provide knowledge on Liquidation of Companies.

**UNIT I: LEASE ACCOUNTING-II:** Meaning of Operating Lease – Advantages and Disadvantages- Differences between Financial Lease and Operating Lease – Accounting Treatment of Operating Lease.(Including problems)

**Lab Work:** Computation of problems using Excel/ Accounting package.

**UNIT II: HUMAN RESOURCE ACCOUNTING:** Meaning-- Definition –Objectives-Approaches-Assumptions-Advantages-Limitations of HRA- Methods of Valuation of Human Resources- HRA in India.(Theory only).

**UNIT III: SOCIAL RESPONSIBILITY ACCOUNTING:** Meaning and nature of social responsibility- need- objectives -accounting concept and objectives of social responsibility- indicators of social performance..(Theory only).


**UNIT IV: LIQUIDATION OF COMPANIES:** Scope- contributory- preferential payments-preference dividend -Statement of Affairs and Deficiency/ Surplus account.(Including problems).

**UNIT V: LIQUIDATOR'S FINAL STATEMENT OF ACCOUNT:** Liquidator's remuneration-receiver for debenture holders-List "B" contributories .(Including problems).

**Lab Work:** Computation of problems using Excel/ Accounting package.

**SUGGESTED READINGS:**

1. R.L. Gupta, & M.Radhaswamy: Corporate Accounting., Sultran Chand.
2. M.A. Arulanandam, & K.S. Raman: Advanced Accounting, Himalaya.
3. Tulasian: Advanced Accounting, Tata McGraw hill Publications.
4. Jain & Narang : Corporate Accounting, Kalyani publications.
5. S.M.Shukla: Advanced Accounting, Sahitya Bhavan.
6. Chandra Bose: Advanced Accounting (Vol-II)PHI.
7. Wood: Frank Wood's Business Accounting (Vol-I) 11/e ,Pearson.

  
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DEPARTMENT OF COMMERCE

B.Com III YEAR ( General and Computer Applications)

Semester -V

BUSINESS LAW - I

Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS).

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS

**Objective:** To familiarize the students with statutory provisions relating to General and Special Contracts

**UNIT I: Business Contracts :** Agreement and Contract-Definition and Meaning – Essentials of a valid Contract – Types of Contracts. Offer and Acceptance. Definition – Essentials of a valid Offer and Acceptance – Communication and revocation of Offer and Acceptance.

**Lab work:** Students are expected to know the cases of Contract Act and should be able to create written Contract in the form of an assignment.

**UNIT II: Consideration and Capacity to Contract:** Meaning, Definition importance and essentials of a valid Consideration – the Doctrines of 'Stranger to Contract' and 'No Consideration – No Contract'.

**Capacity to Contract-Minor** –Special rules regarding minor's agreements, Lunatics, Insolvents and Persons disqualified to enter in to the Contract.

**Lab Work:** Students are advised to go through the cases of Consideration and Capacity to Contract.

**UNIT III: Consent :** Meaning – Free Consent – Flaw in Consent, Coercion, undue influence, fraud, misrepresentation and Mistake.

**Lab Work :** Students are expected to know the cases relating to Coercion, undue influence, fraud, misrepresentation and Mistake.

**UNIT IV: Legality of Object and Consideration:** Concept of Legality of Object – and consideration – Illegal and immoral agreements – Agreements opposed to public policy. Agreements expressly declared to be void – wagering agreements and Contingent contracts.

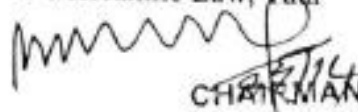
**Lab Work :** Students are expected to know the cases of legality of Object and consideration and Contingent Contracts.

**UNIT V: Discharge and Breach of Contract:** Meaning of Discharge of a contract –Various modes of discharge of a contract – performance of contracts. Breach of a contract-Concept – Types – Remedies for breach of a Contract.

**Lab Work:** Students have to go through the cases relating to discharge and breach of a contract.

**SUGGESTED READINGS:**

- |                  |                                |
|------------------|--------------------------------|
| 1. S . S.Gulshan | : Mercantile Law, Excel Books. |
| 2. Kapoor ND     | : Company Law, Sultan Chand    |
| 3. S.N.Maheswari | : Business Laws, Himalaya      |
| 4. Balachandran  | : Business Law, Tata           |
| 5. Tulsian       | : Mercantile Law, Tata         |



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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester -VI  
**BUSINESS LAW - II**  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (50T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS).

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS

Objective: To introduce the students to the statutory provisions that effects the business decisions.

**UNIT I: Sale of Goods Act 1930:** Contract of sale- Definition- Features- Definition to the term goods – Types of goods – Rules of transfer of property in goods- Difference between sale and agreement to sell- Rights of unpaid seller.

Conditions and Warranties- Meaning and Distinction- Express and implied.

Conditions and Warranties- Sale by Non- owners- Auction sale.

**Lab work:** Students are expected to know the cases and practical problems relating to the sale of goods act. Students are advised to refer to the Internet Website and prepare the assignments.

**UNIT II: Consumer Protection act 1986:** Definition of the terms- Consumer , Unfair trade practices, Restrictive trade practices and complainant. Rights of Consumers for Consumer Protection Councils- Consumer Redressal Agencies- Penalties for violation.

**Lab Work:** Students are expected to know the model for a complaint, Checklist of requirements for petition to be filed before the National Consumer Disputes Redressal Commission. Cases and practical problems under the Consumer Protection Act. Students are advised to refer to the Internet Website and prepare the assignments.

**UNIT III: Intellectual Property Rights: Concept** of Intellectual property rights- Meaning-Need and objectives- Meaning of the terms – Copy right, Patents, Trade marks. Information Technology Act 2000: Aims and Objectives- Scope – Cyber Crimes and punishments for the offenders.

**Lab Work :** Students are expected to prepare the assignments on Patents, Copyrights, Trade marks and Information Technology Act 2000.

**UNIT IV: Company Law:** Doctrine of Ultravires and its effects- Doctrine of Constructive Notice- Doctrine of Indoor Management and its exceptions. Management of companies- Directors- Qualifications- Disqualifications- Appointment – Removal- Rights and duties- Company meetings and resolutions- Appointment of a Company Secretary.

**Lab Work :** Students are expected to know the cases of Companies Act. Students are advised to refer to the Internet Website and prepare the assignments.

**UNIT V: Winding Up of a Company:** Winding up of companies: Various modes- Compulsory winding up, Powers and duties of Official Liquidator- Members and Creditors Voluntary winding up - Winding up subject to the supervision of the Court- Dissolution.

**Lab Work:** Students are expected to prepare assignments on procedure to wind up a company.

**SUGGESTED READINGS:**

1. S. S.Gulshan
2. Kapoor ND
3. S.N.Maheswari
4. Balachandran
5. Tulsian

: Mercantile Law, Excel Books.

: Company Law, Sultan Chand

: Business Laws, Himalaya

: Business Law, Tata

: Mercantile Law, Tata

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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester -V  
**AUDITING**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives:**

- 1.To impart knowledge pertaining to basic concepts of Auditing.
- 2.To impart knowledge to students procedure of conducting Audit.

**UNIT I: INTRODUCTION TO AUDITING:**

Origin-Evolution of Auditing-Meaning-Definition-Book-Keeping, Accountancy and Auditing-Auditing & Investigation- Importance of Auditing & its Limitations- Objectives of Auditing-Aspects to be covered in an Audit-Basic Principles governing an Audit- Qualifications and Disqualifications of an Auditor-Qualities of an Auditor-Appointment, Remuneration and Removal of an Auditor.

**UNIT II: AUDITOR AND AUDIT PLANNING:**

Rights & Duties of an Auditor – Liabilities of an Auditor- Position of an Auditor.  
Audit Planning- Meaning- Objectives of Audit Planning-Engagement Letter-Audit Process  
Audit Programme: Meaning-Definition- Features –Objectives-Contents -Factors to be considered for the purpose of Audit Programme Preparation-Advantages-Limitations -Precautions to overcome limitations-Audit Note Book- Audit Working papers.

**Lab Work:**Preparation of Audit Plan for an organisation.

**UNIT III:CLASSIFICATION OF AUDIT:**

Classification based on objectives: Independent/financial/Statutory Audit-Internal Audit-Cost Audit- Management Audit-Tax Audit—Government Audit-Secretarial Audit.  
Classification based on Timing, conduct and scope of Audit: Final Audit-Continuous Audit-Interim Audit- Occasional Audit-Partial Audit-Balance sheet Audit –Cash Audit-Differences between different types of Audit.

**NOTE:** Classification based on ownership would be covered in Semester VI.

**UNIT IV: INTERNAL CHECK AND INTERNAL CONTROL:**

Internal Check: Meaning- Definition-Objectives-Principles of Good Internal Check system- Advantages and Limitations-Internal Check And Auditor-Internal Check with regard to cash transactions, trading transactions and payroll.  
Internal Control: Meaning-Definition-Objectives-Scope -Internal Control, Internal Check and Internal Audit and their differences-Sampling in Audit-Audit in Depth-Audit Evidence-Concept of materiality-Audit Markings.

**UNIT V: VOUCHING AND INVESTIGATION:**

Meaning-Definition-Importance-Types of Vouchers-Points to be noted while examining a Voucher-Vouching of Cash transactions, trading transactions, Journal Proper and Ledgers.  
Investigation: Meaning-Definition-Objectives and Essentials of Investigation-Points to be kept in mind while conducting Investigation-Circumstances which calls for investigation-Investigation on behalf of the proprietor of a business, on behalf of investors and Statutory Investigation.

**Lab Work:** Vouching of cash book of a local business unit.

**SUGGESTED READINGS:**

- 1.Practical Auditing: R.G.Saxena, Himalaya Publications.
- 2.Auditing: N.D.Kapoor.
- 3.Practical Auditing: T.N.Tandon.
- 4.Fundamentals of Auditing: Kamal Gupta & Ashok Gupta.
- 5.Auditing:Kalyani Publishers.

  
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**GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYD-16**  
(An Autonomous College of Osmania University)  
Re-accredited by NAAC with "B" Grade  
**DEPARTMENT OF COMMERCE**  
B.Com III YEAR ( General and Computer Applications)  
Semester -VI  
**AUDITING, BUSINESS CORRESPONDENCE & REPORT WRITING**  
Applicable from the academic year-2014-15 onwards.

TIME: 2 ½ Hours

MAX.MARKS: 50 (30T + 10I + 10P)

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Objectives:**

1. To impart Knowledge pertaining to basic concepts of auditing.
2. To acquaint students with auditing procedure and report writing

**UNIT-I: Verification and Valuation of Assets and Liabilities:** Meaning- Definition- Objectives- Points involved in verification and valuation of assets - Auditors duty and position with regard to Verification and valuation of assets and liabilities-Differences between vouching,-verification and valuation  
Verification and valuation of some of the assets:  
Fixed assets: Land & Buildings, Plant & Machinery, Furniture & Fixtures and Motor Vehicles.  
Intangible assets: Goodwill, Patents and copyrights.  
Current assets: Cash in hand, cash at bank, Stock in trade, Bills receivable, Debtors & Investments.  
Fictitious Assets: Preliminary Expenses, Discount on issues of shares and Debentures.  
Verification and Valuation of Liabilities: Capital, Debentures, Loans, Trade creditors, Bills payable, Contingent Liabilities and Outstanding Expenses.

**Unit-II: Audit of Institutions:** Classification of Audit based upon ownership- Audit of Sole trader- Partnership firm- companies - Non-Trading concerns- Co-operative societies- Statutory corporations/ Nationalized banks & Public utilities.


**Unit-III: Audit Report:** Meaning, Definition, Importance-Basic elements of an Audit report- Contents of an Audit report- Auditors duty in preparation of an audit report- Concept of True & Fair- General guidelines to be followed by an Auditor while drafting an audit report-Types of Reports: Qualified- Unqualified- Disclaimer and Negative.  
**Lab Work:** Collection of Published Audit Reports and Preparation of Similar reports.

**UNIT-IV: Business Correspondence:** Meaning- Features- Importance- Principles of good Business Letters-Elements of a Business letter- Structure or format of a Business letter - Styles of letter writing- Business letters.  
**Lab Work:** Drafting of Model Business letters.

**UNIT-V: Business Reports:** Meaning- Definition-Features- Objectives- Essentials of good business reports-Structure -Types of Reports.  
**Lab Work:** Drafting of Model Business Reports.

**SUGGESTED READINGS:**

1. Practical Auditing: R.G.Saxena, Himalaya Publications.
2. Auditing: N.D.Kapoor.
3. Practical Auditing: T.N.Tandon.
4. Fundamentals of Auditing: Kamal Gupta & Ashok Gupta
5. Business Communication & Report Writing: V.BalaMohan Das, & SivaDevi Kalyani Publishers.
6. Auditing :Kalyani Publishers.

  
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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester - V  
**COST ACCOUNTING - I**  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HOURS(4THEORY+2COMPUTER LAB SESSIONS).

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS

**OBJECTIVES :**

1. To enable the students to prepare Cost Sheet.
2. To impart knowledge of Material, Labour and Overhead cost.
3. To enable the students to prepare Contract Accounts using Accounting Package/Excel.

**UNIT I: INTRODUCTION :** Meaning , Definition, Nature , Scope, Objectives of Cost Accounting, similarities between Cost Accounting and Financial Accounting , Difference between Cost Accounting, Financial Accounting and Management Accounting, Cost Accounting as an Aid to Management, Limitations of Cost Accounting, Advantages of Cost Accounting.(Theory Only).

- UNIT II: INSTALLATION OF COSTING SYSTEM :** Meaning, Characteristics of a good Costing System, Steps for Installation, Difficulties in Installing a Costing System, Methods and Techniques of Costing, Cost Concepts, Cost Centre, types of Cost Centre, Classifications of Cost, Elements of Cost, Cost Sheet, Preparation of Cost Sheet. (Including Problems)  
**Lab Work:** Preparation of Cost Sheet using Excel/Accounting Package.

**UNIT III: MATERIAL COST:** Meaning, Direct and Indirect material Cost, Centralized Vs Decentralized Purchasing, Purchase Requisition , Stores – Need, Importance of stores, Objectives. Store Keeper- Responsibilities duties , Store keeping records - Bin Card, Store Ledger, Pricing of Material Issues, Methods of Material Issues. ( Including Problems)  
**Lab Work :** Preparation of Stores Ledgers on various Methods using Excel/Accounting Package.

**UNIT IV: LABOUR COST AND OVERHEADS :** Meaning, Direct and Indirect Labour cost, Time Keeping and Time Booking , Methods of Time Keeping. Time Booking- Objectives, Methods. Methods of Wage Payment – Time Rate system, Piece Rate system. Incentive Plans- Halsey Premium Plan, Rowan Plan, Taylor's Differential Piece Rate system and Merrick's Differential Piece Rate system. Labour Cost - Labour Turnover. ( Including Problems)  
Overheads – Meaning, Classification, Allocation and Apportionment of overheads, Absorption of overheads – Methods of Absorption of overheads. (Including Problems)  
**Lab Work :** Preparation of Apportionment of overheads Statement using Excel/Accounting Package.

**UNIT V: METHODS OF COSTING – I :** Single or Output Costing ,production Account, Tender and Quotation. Job Costing and Contract Costing – Job Cost Sheet , Methods of Accounting – Profits on incomplete contract and Profit on Completed Contract.(Including Problems)  
**Lab Work:** Preparation of contract Accounts using Excel/Accounting.

**SUGGESTED READINGS**

- |                    |                             |
|--------------------|-----------------------------|
| 1. Cost Accounting | : S.P Jain and K .L. Narang |
| 2. Cost Accounting | : M.N. Arora                |
| 3. Cost Accounting | : N.K. Prasad               |
| 4. Cost Accounting | : P.K Gosh                  |

  
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DEPARTMENT OF COMMERCE  
**B.Com III YEAR ( General and Computer Applications)**  
Semester –VI  
**COST ACCOUNTING - II**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1)HOURS(4 THEORY+2 COMPUTER LAB SESSIONS)**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS**

**OBJECTIVES :**

- 1.To enable the students to prepare Process Accounts.
- 2.To impart knowledge of Marginal Costing.
- 3.To enable the students to compute problems on variances using Accounting Package/Excel.

**UNIT I: METHODS OF COSTING II AND COST RECONCILIATION :** Process Costing – Meaning, Process Loss, Abnormal Loss or Gain(Excluding equivalent production and inter process profits). Operating Costing– Features, Applications, Advantages, Operating Cost Sheet(with reference to transport Undertakings only). Cost Reconciliation- Reconciliation of Cost and Financial Accounts, Reasons for Disagreement, Need for Reconciliation, Preparation of Reconciliation Statement.(Including Problems).

**Lab Work:** Preparation of Process Accounts and Operating Cost Sheet using Excel/Accounting Package.

**UNIT II: MARGINAL COSTING :** Meaning, Difference between Marginal Costing and Absorption Costing, Types of Costs, Applications of Marginal Costing, Advantages and Limitation of Marginal Costing , Marginal costing Equation (Including Problems).

**UNIT III: BREAK EVEN ANALYSIS :** Meaning, Definition, Break Even Point, Cash Break Even Point, Composite Break Even Point, Margin of Safety, Break Even Chart, Cost Volume Profit Analysis ( Including Problems)

**Lab Work :** Computation of problems on Break Even point using Excel/Accounting Package.



**UNIT IV: STANDARD COSTING :** Meaning, Definition, Standard Cost , Estimated Cost, Differences Between Standard costing and Historical Costing, Differences Between Budgetary Control and Standard Costing, Advantages and Limitations of Standard Costing, Steps involved in Standard Costing , Types of Standard. ( Theory Only)

**UNIT V: VARIANCE ANALYSIS:** Meaning, Types of Variances, Material Variance, Labour Variance and Overhead Variance..(Including Problems)

**Lab Work:** Computation of Problems on Variances using Excel/Accounting Package.

**SUGGESTED READINGS**

- |                   |                             |
|-------------------|-----------------------------|
| 1.Cost Accounting | : S.P Jain and K .L. Narang |
| 2.Cost Accounting | : M.N. Arora                |
| 3.Cost Accounting | : N.K. Prasad               |
| 4.Cost Accounting | : P.K Gosh                  |

  
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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester - V  
**MANAGEMENT ACCOUNTING - I**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives:**

- 1.To enable the students with the knowledge of MAS and MIS in Management Accounting.
- 2.To enable the students in computing Ratios with the help of Excel/Accounting package

**UNIT I: INTRODUCTION TO MANAGEMENT ACCOUNTING:** Definition-Scope-Objectives of Management Accounting – Functions of Management Accounting - Differences between Financial Accounting ,Cost Accounting and Management Accounting - Advantages and Disadvantages of Management Accounting-Role of Management Accountant-Functions-Duties. Controller-Functions-Duties-Qualities of Management Accountant.(Theory only)

**UNIT II: MANAGEMENT ACCOUNTING SYSTEM AND MIS:** Meaning-Process of Management Accounting System-Management Information System-Meaning -Definition-Essentials of a Good MIS-Preparation of Information-Essentials of a Good Report-Modes of Reporting-Kinds of Reports-Effectiveness of MIS.(Theory Only)

**UNIT III: FINANCIAL STATEMENT ANALYSIS:** Meaning-Advantages- Limitations of Financial Statements-Process of Financial Statement Analysis –Types of Financial Statements Trend Analysis-Steps in Computation of Trend Values. (Including Problems)

**Lab work:** Computation of problems on various techniques of Trend Analysis using Excel/Accounting Package.

**UNIT IV: TECHNIQUES OF FINANCIAL STATEMENT ANALYSIS:** Different techniques of analysis of Financial Statements – Comparative, Common size statements (Including problems)

**Lab work:** Using Excel/Accounting Package computation of problems on various techniques of financial statement analysis.

**UNIT V: RATIO ANALYSIS -I:** Meaning, Advantages and Limitations of Ratio Analysis – Classification of Accounting Ratios: Based on Liquidity or Solvency and Leverage or Capital Structure (Including Problems).

**Lab Work:** Computation of Ratios using Excel/Accounting Package.

**SUGGESTED READINGS:**

1. Introduction to Management Accounting : Charles T, Horngern et al
2. Tools and Techniques of Management Accounting : N.Vinayakam
3. Management Accounting : S.P.Gupta
4. Management Accounting : Manmohan and Goyal
5. Management Accounting : V.Krishna Kumar
6. Practical problems in Management Accounting : Dr.Kulsreshya and Gupta
7. Management Accounting : Bhattacharya
8. Management Accounting : Murthy and Guruswamy.

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**DEPARTMENT OF COMMERCE**  
**B.Com III YEAR ( General and Computer Applications)**  
Semester -VI  
**MANAGEMENT ACCOUNTING - II**  
Applicable from the academic year-2014-15 onwards.

**MAX.MARKS: 50 (30T + 10I + 10P)**

**TIME: 2 ½ Hours**

**PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.**

**NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.**

**Objectives:**

1. To enable the students with the knowledge of Funds Flow and Cash Flow Analysis
2. To enable the students with the concept of Budget, Budgeting and Budgetary Control.

**UNIT I: RATIO ANALYSIS-II:** Classification of Accounting ratios based on Activity or Turnover, Profitability, General Profitability and Overall Profitability, Preparation of Balance Sheet based on Ratios (Including problems)

**LabWork:** Using Excel Accounting Package computation of problems on Ratio Analysis.

**UNIT II: FUNDS FLOW ANALYSIS:** Meaning-Concepts of funds and Funds Flow – Uses and Limitations of Funds Flow Analysis – Preparation of Funds Flow Statement.(Including problem)

**LabWork:** Using Excel Accounting Package computation of problems on Funds Flow Statement.

**UNIT III: CASH FLOW ANALYSIS:** Concepts of cash and Cash Flow – Preparation of Cash Flow Statement as per Accounting Standard No.3 – Uses and Limitations of Cash Flow Analysis.(Including problems)

**Lab Work:** Using Excel Accounting Package computation of problems on Cash Flow Analysis.

**UNIT IV: BUSINESS BUDGETS:** Meaning-Definition-Importance-Advantages-Essentials of Budget-Classification of Budgets.(Including Problems).

**Lab Work:** Using Excel Accounting Package computation of problems on Budgets

**UNITV: BUDGETARY CONTROL:** Meaning-Definition-Objectives-Essentials-Advantages-Limitations.(Theory Only)

**SUGGESTED READINGS:**

1. Introduction to Management Accounting : Charles T, Horngern et al
2. Tools and Techniques of Management Accounting : N.Vinayakam
3. Management Accounting : S.P Gupta
4. Management Accounting : Manmohan and Goyal
5. Management Accounting : V.Krishna Kumar
6. Practical problems in Management Accounting : Dr.Kulsreshtha and Gupta
7. Management Accounting : Bhattacharya
8. Management Accounting : Murthy and Guruswamy.

  
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DEPARTMENT OF COMMERCE  
B.Com III YEAR (Computer Applications)  
Semester - V  
E-COMMERCE-I  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Unit-I:**

Overview of Electronic Commerce Definition of E-Commerce- E-Business- Potential Benefits of Electronic Commerce- The Internet and World wide web (www) as enabler of E-Commerce.

**Unit-II:**

Impact of E-Commerce on Business Model- Electronic Commerce Applications – Market forces influencing highway – Global Information Distribution Network.

**Unit-III:**

E-Commerce and WWW- Architecture Framework- Technology behind the Web- Hyper text publishing.

**Unit-IV:**

Security and the Web- Security protocols and the web Security issues- Encryption techniques.

**Unit-V:**

Consumer Oriented E-Commerce Applications- Mercantile Process Models from Consumers and Merchant's Perspective.

**Lab Work:** Using Microsoft Front page editor design a static website.

**Suggested Readings:**

1. E-commerce- Greenstein & Feinman
2. E-Commerce- Gurvinder singh & Rachhpal singh
3. E-Commerce- S.Brinda & R.Mangavani

  
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DEPARTMENT OF COMMERCE  
B.Com III year ( Computer Applications)  
Semester -V E-COMMERCE-I  
Applicable from the academic year-2014-15 onwards.  
Computer Lab - Practicals Question Bank

Time: 30 Minutes

Record : 03

Skill/ viva : 07

Total Marks : 10

1. a. Create a program in HTML to insert an image in the webpage and that image should act as a hyperlink.  
b. Create a web page which contains the heading HYDERABAD in h3 size, separated by a thick line and below which there is a description of Hyderabad in two paragraphs. one aligned to the right and the other justified.
2. a. Create a HTML program which should have the name of your favourite Hero/Heroine and it should be in following styles Bold, Italics, Teletype Underlined, Strikethrough, Subscript and Superscript, b. Create a Table HTML
3. a. Create a web page using HTML which will feature an image and on the right side of the image there will be some lines of the text about the image. b. Create an unordered list of various courses offered in your college.
4. a. Create a table with one row and four columns\* in the first column Number should be displayed and in the subsequent columns. 1. 2. 3.4 should be displayed b. Create a program to create pull-down menu.\*.
5. a. Create a table with 2 rows\* and three columns with first column in red, second in blue and third in green color.  
b. Create an HTML program which contains the HAPPY NEW YEAR 2007 in H3 size and it should be blinking, with background in red color.
6. a. Create a paragraph of ten lines with about five footnotes in it and hyper link each Footnote in such a way that if we click on the number, it should show us the Footnote.

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DEPARTMENT OF COMMERCE  
B.Com III YEAR (Computer Applications)  
Semester -VI  
E-COMMERCE-II  
Applicable from the academic year-2014-15 onwards.

MAX MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Unit-I:**

Electronic Payment Systems- Types of Payments System( Credit Card, E-cash, Smart card, Digital Payments etc) Risk in E-Payments- Designing E-Payment Systems.

**Unit-II:**

Electronic Data Interchange (EDI)- EDI Applications in business – Legal, Security and Privacy Issues in EDI and E-Commerce.

**Unit-III:**

Internet based EDI- Intra Organizational E-Commerce.

**Unit-IV:**

Web based Marketing- Introduction and Scope of Marketing – Business, Marketing and Information Technology congruence.

**Unit-V:**

Advertising and Marketing on the Internet – Application of 4 Ps (Product, Price, Place & Promotion) in internet- Marketing Supply Chain Management.

**Lab Work:**

Using HTML. Design a static website.

**Suggested Readings:**

1. E-commerce- Greenstein & Feinman
2. E-Commerce- Gurvinder singh & Rachhpal singh
3. E-Commerce- S.Brinda & R.Mangavani

  
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DEPARTMENT OF COMMERCE

B.Com III YEAR (Computer Applications)

Semester -V

WEB PROGRAMMING - I

Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Unit-1:** Html Programming Introduction-Classification of Tags-Padded tags  
Unpadded tags-Formatting Tags-Hyper Links-Heading tags.

**Unit-2:** Forms-Meaning of Forms-Creation of Forms-Creation of Tables-  
meaning of Frames-Creation of Frames-Web design Principles.

**Unit-3:** Dynamic HTML Programming Introduction-Difference between  
HTML and DHTML.Static and Dynamic, Procedural and Non-Procedural  
Programming in DHTML, Event Handling.

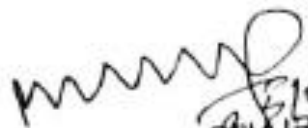

**Unit-4:** Cascading Style Sheets (CSS)-Document Object Model (DOM)-Change  
like Style, Text, Graphics, Placement, Creating multimedia effects with Filters-  
Different types of Errors, Runtime Errors, System Errors etc.

**Unit-5:** Visual Basic Script introduction-Introduction to Scripting Language-  
Features of VB-Script-VB-Script Variable-Constants- Client-Server Programming.

**Lab work:** Creation of Dynamic web Pages through HTML.

**Suggested Readings:**

- 1) Microsoft official curriculum
- 2) Essential XML: Box
- 3) Dynamic HTML: Rule
- 4) HTML for the WWW: Castro

  
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DEPARTMENT OF COMMERCE

B.Com III YEAR (Computer Applications)

Semester - VI

WEB PROGRAMMING - II

Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ¼ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**Unit-1:** VB-Script (contd...) –Data types in VB-Script-Operators in VB-Script-Input box-Msg box- Conditional Statements in VB-Script -Loop Statements in VB-Script.

**Unit-2:** Arrays-Singular Array-Multiple Arrays-Arrays handling mechanism-Example of Arrays-Data Validation Techniques.

**Unit-3:** Strings-Meaning of String-String Functions (or) String manipulation mechanism-Functions-Meaning of functions-Procedures in VB-Script.

**Unit-4:** Extensible Markble Language (xml)-Introduction to XML-Features of XML-Components of XML-Comparison of XML with other web Designing languages-creating Xml Documents-XML Style sheets.

**Unit-5:** Extensible Style Language (XSL)-XML Document Object Model-XML Query Language-Difference between XML and XSL-Hyperlink in XML- XML Data Type Definition (DTD's).

**Lab work:** Creation of Dynamic web Pages through HTML.

#### Suggested Readings:

- 1) Microsoft official curriculum
- 2) Essential XML: Box
- 3) Dynamic HTML: Rule
- 4) HTML for the WWW: Castro

  
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DEPARTMENT OF COMMERCE

B.Com III YEAR ( General and Computer Applications)

Semester -V

PRINCIPLES OF MARKETING -I

Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**UNIT I: INTRODUCTION:** Nature and Scope of Marketing -Importance of Marketing in Indian context-Marketing as a business function.

**UNIT II: MARKETING CONCEPTS:** Selling v/s Marketing-Marketing Mix-Marketing Environment.

**Lab Work:** Preparation of reports on marketing environment of different FMCG or Retailing Companies.

**UNIT III: CONSUMER BEHAVIOUR:** Nature, Scope and Significance of Consumer Behaviour - Consumer Behaviour Theories.

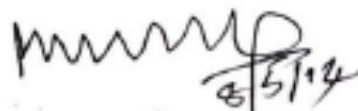
**UNIT IV: MARKETING SEGMENTATION:** Concept and Importance- Bases for Market Segmentation.

**Lab Work:** A report preparation on enhancing life styles in different walks of life creating demand for new Companies.

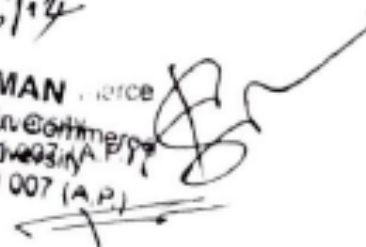
**UNIT V: PRPDUCT:** Concept of products-Types of products. New product development -packing role and function.

**SUGGESTED READINGS :**

1. Philip Kotler : Marketing , Prentice hall.
2. Chandra Bose : Modern Marketing, PHI
3. S. A. Sherlekhar : Marketing Management , Himalaya Publications.



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DEPARTMENT OF COMMERCE  
B.Com III YEAR ( General and Computer Applications)  
Semester -VI  
PRINCIPLES OF MARKETING -II  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS

**UNIT I: BRAND NAME AND TRADE MARKS:** After Sales services, Product life cycle concept.

**UNIT II: PRICE:** Importance- Price as marketing mix- Factors influencing price determination of a product/ service .Discounts and rebates.

**Lab Work:** Preparation of reports on marketing environment of different FMCG or Retailing Companies.

**UNIT III: DISTRIBUTION CHANNELS:** Concept and role- Types of distribution channels.


**UNIT IV:FACTORS AFFECTING CHOICE PF DISTRIBUTION CHANNELS:** Retailer and Wholesaler-Physical distribution of goods- Transportation-warehousing-Inventory control-order processing.

**UNIT V: PROMOTION:** Methods-Optimum promotion mix-Advertising media and its relative merits and limitations.

**Lab Work:** Report on Promotional mix for different FMCG products.

**SUGGESTED READINGS :**

1. Philip Kotler : Marketing , Prentice hall.
2. Chandra Bose : Modern Marketing, PHI
3. S. A. Sherlekar : Marketing Management , Himalaya Publications.

  
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DEPARTMENT OF COMMERCE  
B.Com III YEAR (General and Computer Applications)  
Semester -V  
RURAL MARKETING- I  
Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**UNIT I:RURAL MARKETING:** Definition of Rural area-Importance of rural Marketing-Nature and Scope of rural Marketing.

**UNIT II: SIZE OF RURAL MARKET:** Distinction between rural and urban Marketing.

**Lab Work:** A report preparation on transformation for rural markets in India.

**UNIT III: RURAL MARKETING ENVIRONMENT:** Geographical-Economic-Socio- Cultural and Infrastructural factors.


**UNIT IV: FACTORS INFLUENCING RURAL MARKETING OPERATIONS:** Factors influencing rural marketing operations.

**Lab Work:** Preparation of reports on Invisible forces influencing the rural markets in India.

**UNIT V: RURAL CONSUMERS:** Characteristics- Product and brand awareness in rural marketing-Attitude and behavior.

**SUGGESTED READINGS :**

1. Rajagopal : Management Rural Business, Wheeler Publications., New Delhi.
2. Moria C. B : Agricultural Marketing , Himalaya Publications, New Delhi.
3. Krishnamacharyulu : Rural Marketing : Text and Cases , Pearson.

  
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DEPARTMENT OF COMMERCE

B.Com III YEAR ( General and Computer Applications)

Semester -VI

RURAL MARKETING -II

Applicable from the academic year-2014-15 onwards.

MAX.MARKS: 50 (30T + 10I + 10P)

TIME: 2 ½ Hours

PPW: 5(4+1) HRS (4THEORY+2COMPUTER LAB SESSIONS.

NOTE: 1 THEORY CLASS IS EQUAL TO 2 COMPUTER/COMMERCE LAB HOURS.

**UNIT I: BUYING PATTERNS:** Buying patterns and influences-Segmenting rural markets.

**UNIT II: RURAL MARKETING STRATEGIES:** Product planning for rural Marketing –Quality and size.

**Lab Work :** Exercises on redesigning the new products by keeping requirements of Rural markets.

**UNIT III: PACKAGING AND BRANDING DECISIONS:** Packaging and Branding Decisions, Pricing Decisions.



**UNIT IV: PROMOTION AND DISTRIBUTION IN RURAL MARKETS:** Media and Advertising copy decisions – Distribution channels and logistics in Rural Markets.

**Lab Work :** A report preparation on Logistic management for Rural market on existing products and markets.

**UNIT V: ECOLOGICAL MARKETING:** Introduction – Product system Life cycle – Green Marketing Mix – Strategy – Price – Marketing Communication.

#### SUGGESTED READINGS :

1. Rajagopal : Management Rural Business, Wheeler Publications., New Delhi.
2. Moria C. B : Agricultural Marketing , Himalaya Publications, New Delhi.
3. Krishnamacharyulu : Rural Marketing : Text and Cases , Pearson.

  
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# MATHEMATICS

## SEMESTER-I

COURSE CODE: MAT101

### 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  $x = f(y)$ ;  $x = f(t)$ ,  $y = \phi(t)$ ;  $r = f(\theta)$  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, Percy 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**

**COURSE CODE: MAT101**

### **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 homogeneous linear 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  $Q(x) = be^{ax}, b \sin ax, b \cos ax, bx^k, Ve^{ax}$ - 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.

GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD - 16

MATHEMATICS PAPER - V (Semester - V)

LINEAR ALGEBRA AND COMPLEX ANALYSIS

Syllabus

**Linear Algebra**

**Unit - I: (15 Hours)**

Vector spaces, General properties of vector spaces, Vector subspaces, Algebra of subspaces, linear combination of vectors. Linear span, linear sum of two subspaces, Linear independence and dependence of vectors, Basis of vector space, Finite dimensional vector spaces, Dimension of a vector space, Dimension of a subspace.

**Unit - II: (10 Hours)**

Linear transformations, linear operators, Range and null space of linear transformation, Rank and nullity of linear transformations, Linear transformations as vectors, Product of linear transformations, Invertible linear transformation.

**Prescribed text book:**

Linear Algebra by V. Krishna Murthy and others

**Reference Books:**

1. Linear Algebra by Kenneth Hoffman and Ray Kunze, Pearson Education (low priced edition), New Delhi
2. Linear Algebra by Stephen H. Friedberg et al Prentice Hall of India Pvt. Ltd. 4<sup>th</sup> edition 2007
3. Linear Algebra by J.N.Sharma and A.R.Vasista, Krishna Prakasham Mandir, Meerut-250002.

**Complex Analysis**

**Unit - III: (10 Hours)**

Representation of complex number in polar form, Roots of complex numbers, Exponential functions, Hyperbolic functions, Trigonometric functions, Inverse hyperbolic functions, Logarithmic functions and their properties.

**Unit - IV: (10 Hours)**

Limit of a complex function, Continuity of a complex function, Derivative of a complex function, Analytic functions, Entire functions, Cauchy Riemann equations, Applications

**Prescribed text book:**

Complex Analysis by JN Sharma

**Reference Books:**

1. Complex Variables and Applications by R.V.Churchill.
2. Higher Engineering Mathematics by B.S Grewal

*M. Ram*  
Head  
Department of Mathematics

*K. S. S. S.*



GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)

BEGUMPET, HYDERABAD - 16

MATHEMATICS PAPER - VI (Semester - VI)

LINEAR ALGEBRA AND COMPLEX ANALYSIS

**Linear Algebra**

**Unit - I: (10 Hours)**

The adjoint or transpose of a linear transformation, Sylvester's law of nullity, characteristic values and characteristic vectors, Cayley- Hamilton theorem, Diagonalizable operators.

**Unit - II: (15 Hours)**

Inner product spaces, Euclidean and unitary spaces, Norm or length of a vector, Schwartz inequality, Orthogonality, Orthonormal set, complete orthonormal set, Gram - Schmidt orthogonalisation process.

**Prescribed text book:**

Linear Algebra by V. Krishna Murthy and others

**Reference Books:**

1. Linear Algebra by Kenneth Hoffman and Ray Kunze, Pearson Education (low priced edition), New Delhi
2. Linear Algebra by Stephen H. Friedberg et al Prentice Hall of India Pvt. Ltd. 4<sup>th</sup> edition 2007
3. Linear Algebra by J.N.Sharma and A.R.Vasista, Krishna Prakasham Mandir, Meerut-250002.

**Complex Analysis**

**Unit - III: (10 Hours)**

Harmonic functions, Methods of finding Harmonic conjugates, Complex Integration, Cauchy theorem, Cauchy Integral formula.

**Unit - IV: (10 Hours)**

Taylor series, Laurent Series, Nature of singularities and Methods of finding residues, Cauchy residue theorem and applications.

**Prescribed text book:**

Complex Analysis by JN Sharma

**Reference Books:**

1. Complex Variables and Applications by R.V.Churchill.
2. Higher Engineering Mathematics by B.S Grewal

M. Ram

B. Bahman and Tyagi

Head  
Department of Mathematics

by M.K. Venkat Ramam

43. Find the principal value of  $(1+i)^{1-i}$   
 44. Find the principal value of  $i^{\log(1+i)}$   
 45. Find all the roots of the equation  $\cos z = 2$

#### UNIT - IV

46. Find all roots of  $\sin hz = i$   
 47. If  $f(z) = \frac{x^2y(y-ix)}{x^2+y^2}$ ,  $z \neq 0$   
           0           at  $z = 0$

Prove that  $\frac{f(z)-f(0)}{z} \rightarrow 0$  as  $z \rightarrow 0$  along any radius vector but not as  $z \rightarrow 0$  along

$$y = ax^3$$

48. Show that  $f(z) = xy + iy$  is continuous everywhere but not analytic  
 49. Show that  $f(z) = z + 2\bar{z}$  is not analytic anywhere in the complex plane  
 50. Show that  $f(z) = \frac{xy^2(x+iy)}{x^2+y^4}$ ,  $z \neq 0$   
                                           = 0           at  $z = 0$

51. Determine which of the following are analytic  
 a.  $2xy + i(x^2 - y^2)$     b.  $\cos hz$

52. Show that  $f(z) = \frac{x^2y^5(x+iy)}{x^4+y^{10}}$ ,  $z \neq 0$   
                                           = 0           at  $z = 0$

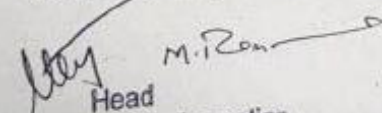
is not analytic at  $z = 0$  although C-R equations are satisfied at the origin.

53. Show that each of the following function is not analytic at any point  
 a.  $\bar{z}$     b.  $|z|^2$   
 54. Find the harmonic conjugate of  $\cos x \cosh y$   
 55. Find the analytic function whose real part is  $x^3 - 3xy^2 + 3x^2 - 3y^2 + 1$   
 56. Find the regular function whose imaginary part is  $e^x \sin y$   
 57. Prove that  $u = x^2 - y^2$ ,  $v = \frac{y}{x^2+y^2}$  are harmonic functions of  $x, y$  but not harmonic conjugates

58. If  $w = e^{z^2}$  find real and imaginary of  $u$  and  $v$  and prove that the curves  $u(x, y) = c_1$  and  $v(x, y) = c_2$  where  $c_1$  and  $c_2$  are constants cut orthogonally

59. Find the analytic function  $f(z) = u + iv$  given  $u = a(1 + \cos \theta)$

60. Find the analytic function  $f(z) = u + iv$  given  $v = \theta \sin \theta$

  
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 Osmania University  
 Hyderabad - 500 007



GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)  
BEGUMPET, HYDERABAD

DEPARTMENT OF MATHEMATICS

PAPER: VII (A) (Semester - V)  
NUMERICAL ANALYSIS

Syllabus

60 hrs

Unit-I: (10 hrs)

**Error in Numerical computations:** Numbers and their Accuracy, Errors and their computation, Absolute, Relative and Percentage errors, a general error formula, Error in a series approximation.

Unit-II: (10 hrs)

**Solution of Algebraic and Transcendental Equations:** The Bisection method, The Iteration method, The method of false Position, Newton-Raphson method, Generalized Newton-Raphson method, Ramanujan's methods, Muller's method.

Unit-III: (20 hrs)

**Interpolation:** Errors in polynomial interpolation, Forward differences, Backward differences, Central differences, Symbolic relations, Detection of errors by use of D.Tables, Differences of a polynomial, Newton's formulae for interpolation formulae, Gauss's central difference formula, Stirling's central difference formula.

Unit-IV: (20 hrs)

**Interpolation with unevenly spaced points:** Lagrange's formula, Error in Lagrange's formula, Derivation of governing equations, End conditions, Divided differences and their properties, Newton's general interpolation.

**Prescribed text Book:**

Scope as in Introductory Methods of Numerical Analysis by S.S Sastry, Prentice Hall India (4<sup>th</sup> Edition).

**Reference Books:** 1) Numerical Analysis by G.Shankar Rao, New Age International Publishers, Hyderabad

2) Finite Differences and Numerical Analysis by H.C.Saxena, S.Chand and Company, New Delhi

*Handwritten notes:*  
Numerical Analysis by Niyogi  
Department of Mathematics  
Numerical Analysis by K. Shankar Narayan and  
K. Vishwa Murthy



GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)  
BEGUMPET, HYDERABAD

DEPARTMENT OF MATHEMATICS

PAPER: VIII (A) (Semester - VI)  
NUMERICAL ANALYSIS  
Syllabus

**Unit-I:**

**Curve Fitting:** Least-Squares curve fitting procedures, fitting a straight line, nonlinear Curve fitting, Curve fitting by a sum of exponentials.

**Unit-II:**

**Numerical Differentiation and Numerical Integration:** Numerical differentiation, Errors in numerical differentiation, Maximum and minimum values of a tabulated function. Numerical integration, Trapezoidal rule, Simpson's  $1/3$  - rule, Simpson's  $3/8$  - rule, Boole's and Weddle's rule.

**Unit-III:**

**Linear systems of equations:** Solution of linear systems - Direct methods, Matrix Inversion method, Gaussian elimination method, Method of factorization, Ill-conditioned Linear systems. Iterative methods: Jacobi's method, Gauss-siedal method.

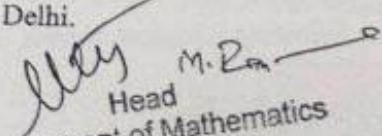
**Unit-IV:**

**Numerical solution of ordinary differential equations :** Introduction, Solution by Taylor's Series, Picard's method of successive approximations, Euler's method, Modified Euler's method, Runge - Kutta methods, Predictor - Corrector methods, Milne's method.

**Prescribed text Book:** Scope as in Introductory Methods of Numerical Analysis by S.S.Sastry, Prentice Hall India (4th Edition.)

**Reference Books:**

1. Numerical Analysis by G. Shankar Rao, New Age International Publishers, Hyderabad.
2. Finite Differences and Numerical Analysis by H.C. Saxena, S. Chand and Company, New Delhi.

  
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GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)  
BEGUMPET, HYDERABAD

DEPARTMENT OF MATHEMATICS

PAPER: VII (B) (Semester - V)  
TRANSFORM CALCULUS  
Syllabus

Unit-I: (10 hrs)

60 hrs

Fourier series: (10 hrs)

Fourier series, theorems, Dirichlet's conditions, Fourier series for even and odd functions.

Unit-II: (10 hrs)

Half range Fourier series, other forms of Fourier series.

Unit-III: (20 hrs)

Laplace transforms:

Definition of Laplace transform, linear property- Piecewise continuous function. Existence of Laplace transform, functions of exponential order and of class A. First and second shifting theorems of Laplace transform, change of scale property. Laplace transform of derivatives, initial value problems, Laplace transform of integrals, multiplication by  $t$ , division by  $t$ , Laplace transform of periodic functions and error function. Beta and Gamma functions.

Unit-IV: (20 hrs)

Inverse Laplace transforms:

Definition of inverse Laplace transform, linear property, first and second shifting theorems of inverse Laplace transform, change of scale property, Division by  $p$ , convolution theorem, Heaviside's expansion formula (with proof and applications).

**Prescribed text Book:** Scope as in **Integral transforms** by A.R.Vasistha & Dr.R.K.Gupta published by Krishna Prakashan Media Pvt.Ltd. Meerut.

**Reference Book:** Operational Mathematics by R.V. Churchill, McGraw Hill Company.

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Department of Mathematics  
Osmania University  
Hyderabad - 500 007

*Integral transforms by Chaitin Vaidhi*  
*by I Snedon.*



GOVERNMENT DEGREE COLLEGE FOR WOMEN (AUTONOMOUS)  
BEGUMPET, HYDERABAD

DEPARTMENT OF MATHEMATICS

PAPER: VIII (B) (Semester - VI)  
TRANSFORM CALCULUS

Syllabus

hrs

60

Unit-I: (15 hrs)

**Fourier transforms:**

Dirichlet's conditions, Fourier integral formula (without proof). Fourier transform. Inverse theorem for Fourier transform, Fourier sine and cosine transforms and their inversion formula. Linearity property of Fourier transforms, change of scale property, shifting theorem, modulation theorem, convolution theorem of Fourier transforms, Parseval's identity.

Unit-II: (10 hrs)

**Inverse Fourier transforms:**

Finite Fourier sine transform, Inversion formula for sine transform, finite cosine transform, inversion formula for cosine transform.

Unit-III: (20 hrs)

**Applications of Laplace transforms:**

Applications of Laplace transforms to the solution of ordinary differential equations with constant coefficients and variable coefficients, simultaneous ordinary differential equations, Partial differential equations.

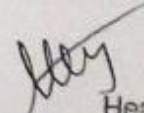
Unit-IV: (15 hrs)

**Applications of Fourier transforms:**

Applications of Fourier transforms to initial and boundary value problems.

**Prescribed text Book:** Scope as in **Integral transforms** by A.R.Vasistha & Dr.R.K.Gupta published by Krishna Prakashan Media Pvt.Ltd. Meerut.

**Reference Book:** Operational Mathematics by R.V. Churchill, McGraw Hill Company.

  
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GOVERNMENT DEGREE COLLEGE FOR WOMEN  
BEGUMPET, HYDERABAD-500016  
(AUTONOMOUS)

B.Sc Statistics Semester –V Syllabus  
(With Mathematics combination)  
(Examination at the end of Semester)  
With Effect from Academic Year-2013-2014  
Paper-III: APPLIED STATISTICS-I

Unit-I

**Analysis of Variance**

Concept of Gauss-Markoff linear model with examples, statement of Cochran's theorem, ANOVA – One-way, two-way classification with one observation per cell Expectation of various sums of squares and Statistical analysis.

**Design of Experiments-I**

Importance and applications of design of experiments. Principles of experimentation, Analysis of Completely Randomized Design (C.R.D), Randomized Block Design (R.B.D). Including one missing observation, expectation of various sum of squares.

(12 L)

Unit-II

**Design of Experiments-II**

Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of R.B.D over C.R.D and L.S.D over R.B.D& C.R.D.

**Official Statistics:** - Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National Income and its computation, utility and difficulties in estimation of national income

(10 L)

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 and Net reproductive rate, Life tables, construction and uses of life tables and Abridged life tables.

(13 L)

UNIT-IV

**Index Numbers:** - Concepts, 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 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.

(10 L)

# Statistics

## **B.Sc Statistics Semester- I Syllabus**

**(With Mathematics Combination)**

**With effect from Academic Year – 2016-17**

### **Paper- I: Descriptive Statistics and Probability**

#### **COURSE CODE:STAT101**

##### **Course Outcome:**

###### **Descriptive Statistics:**

After completing this course, the students should have developed a clear understanding about :

- The Concepts of statistical population and sample, variables and attributes.
- Tabular and graphical representation of data based on variables.
- 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.
- The concept of random variables and distribution function. Probability mass and density functions.
- To understand and interpret the expected value and variance of a random variable and various properties of expectation and variance.

##### **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, trial, 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), cumulant 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.

#### **List of reference books:**

1. Charles M. Grinstead and Laurie Snell, J: Introduction to Probability, American Mathematical Society
2. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
3. V.K. Kapoor and S.C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi
4. GoonAM, GuptaMK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
5. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
6. M.JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
7. Sanjay Arora and Bansilal: New Mathematical Statistics : Satya Prakashan , New Delhi
8. Hogg. Tanis. Rao: Probability and Statistical Inference. 7<sup>th</sup> edition. Pearson
9. Sambhavyata Avadhi Siddantalu—Telugu Academy
10. Sahasambandham-Vibhajana Siddantamulu – Telugu Academy
11. K.V.S. Sarma: Statistics Made Simple: do it yourself on PC. PHI
12. Gerald Keller: Applied Statistics with Microsoft excel. Duxbury, Thomson Learning.
13. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel 4<sup>th</sup> edition. Pearson Publication.
14. Abraham Kendall and Baker: Discrete Mathematics for Computer Science.



## **B.Sc I Year Statistics Semester- I**

**(With Mathematics Combination)**

**(Examination at the end of Semester I)**

**With effect from Academic Year – 2016-17**

**Practical Paper- I (with 3 HPW, Credits 1 and marks 50)**

1. Basic of Excel- data entry, editing and saving, establishing and copying formulae, built in Functions in excel, copy and paste and exporting to MS- word document. ( Not for the examinations).
2. Graphical presentation of data (Histogram, frequency polygon, Ogives).
3. Graphical presentation of data (Histogram, frequency polygon, Ogives) using MS- Excel.
4. Diagrammatic presentation of data (Bar and pie).
5. Diagrammatic presentation of data (Bar and pie) using MS- Excel.
6. Computation of non- central and central moments- Sheppard's corrections for grouped data.
7. Computation of coefficients of Skewness and Kurtosis- Karl Pearson's and Bowley's  $\beta\beta_1$  and  $\beta\beta_2$ .
8. Computation of Measures of central tendency, dispersion, Coefficient of variation and coefficient of Skewness, Kurtosis using MS- Excel.

## **B.Sc I Year Statistics Semester- II Syllabus**

### **COURSE CODE:STAT201**

#### **Paper- II: PROBABILITY DISTRIBUTIONS**

**(4 HPW with 4 Credits and 100 Marks)**

##### **Course Outcome:**

- P.m.f and p.d.f of various discrete and continuous probability distributions
- Application of probability distributions to a variety of problems in diversified fields.

##### **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.

### **List of reference books:**

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
2. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi
3. GoonAM,Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
4. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
5. M.JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
6. Sanjay Arora and Bansilal: New Mathematical Statistics : Satya Prakashan , New Delhi
7. Hogg.Tanis.Rao: Probability and Statistical Inference. 7<sup>th</sup> edition. Pearson
8. SambhavyataAvadhiSiddantalu—TeluguAcademy
9. Sahasambandham-VibhajanaSiddantamulu – TeluguAcademy
10. K.V.S. Sarma: Statistics Made Simple: do it yourself on PC. PHI
11. Gerald Keller: Applied Statistics with Microsoft excel. Duxbury, Thomson Learning.
12. Levine, Stephen, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel 4<sup>th</sup> edition. Pearson Publication.
13. Abraham Kendall and Baker: Discrete Mathematics for Computer Science.
14. Charles M.Grinstead and Laurie Snell,J:Introduction to Probability,American Mathematical Society



## **B.Sc I Year Statistics Semester- II**

### **Practical Paper- II (with 3 HPW, Credits 1 and marks 50)**

1. Fitting of Binomial distribution- Direct method.
2. Fitting of Binomial distribution- Direct method using MS Excel.
3. Fitting of Binomial distribution- Recurrence relation method.
4. Fitting of Poisson distribution- Direct method.
5. Fitting of Poisson distribution- Direct method using MS Excel.
6. Fitting of Poisson distribution- Recurrence relation method.
7. Fitting of Negative Binomial distribution.
8. Fitting of Geometric distribution.
9. Fitting of Normal distribution- Areas method.
10. Fitting of Normal distribution- Ordinates method.
11. Fitting of Exponential distribution.
12. Fitting of Exponential distribution using MS Excel.
13. Fitting of a Cauchy distribution.
14. Fitting of a Cauchy distribution using MS Excel.

## **B.Sc Statistics Semester- III Syllabus**

### **Paper- III: Statistical Methods and Theory of Estimation**

**(4 HPW with 4 credits and 100 marks)**

COURSE CODE:STAT301

#### **Course Outcome:**

- Learn about the properties of correlation and regression.
- Use of Regression analysis for estimation and prediction purpose.
- To understand the various methods of estimation.

#### **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 versus 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.

### List of Reference Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand&Sons, New Delhi
2. Goon AM, Gupta MK, Das Gupta B : Outlines of Statistics , Vol-II, the World Press Pvt.Ltd.,Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
- 4 .Sanjay Arora and Bansilal: New Mathematical Statistics SatyaPrakashan , New Delhi
- 5.Hogg and Craig :Introduction to Mathematical statistics. Prentice Hall
- 6.Siegel,S.,and Sidney: Non-parametric statistics for Behavioral Science. McGraw Hill.
- 7GibbonsJ.D and SubhabrataChakraborti: Nonparametric Statistical Inference. Marcel Dekker.
- 8.ParimalMukhopadhyay: Mathematical Statistics. New Central Book agency.
- 9.Conover : Practical Nonparametric Statistics. Wiley series.
- 10.V.K.Rohatgi and A.K.Md.EhsanesSaleh: An introduction to probability and statistics. Wiley series.
- 11.MoodAM,GraybillFA,Boe's DC. Introduction to theory of statistics. TMH
12. Paramiteyamariyuaparameteyaparikshalu. Telugu Academy.
- 13.K.V.S. Sarma: Statistics Made simple do it yourself on PC. PHI
- 14.Gerald Keller: Applied Statistics with Microsoft excel. Duxbury. Thomson Learning
- 15.Levin, Stephan, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel.4<sup>th</sup> edition. Pearson Publication.
- 16.Hogg, Tanis, Rao. Probability and Statistical Inference.7<sup>th</sup> edition. Pearson Publication.
- 17.Milton and Arnold(fourth Edition):Introduction to Probability and statistics,Tata Mcgraw hill Publication.



## **B.Sc II Year Statistics Semester- III**

**(Examination at the end of Semester III)**

### **Practical Paper- III (with 2 HPW, Credits 1 and marks 25)**

1. Generation of random samples from Uniform (0,1), Uniform (a,b) and exponential distributions.
2. Generation of random samples from Normal and Poisson distributions.
- 3. Simulation of random samples from Uniform (0,1), Uniform (a,b), Exponential, Normal and Poisson distributions using MS Excel.**
4. Fitting of straight line and parabola by the method of least squares.
- 5. Fitting of straight line and parabola by the method of least squares using MS Excel.**
6. Fitting of power curves of the type  $y = a x^b$ ,  $y = a b^x$  and  $y = a e^{bx}$  by the method of least squares.
- 7. Fitting of power curves of the type  $y = a x^b$ ,  $y = a b^x$  and  $y = a e^{bx}$  by the method of least squares using MS Excel.**
8. Computation of Yule's coefficient of association.
9. Computation of Pearson's, Tcherprows coefficient of contingency.
10. Computation of correlation coefficient and regression lines for ungrouped data.
11. Computation of correlation coefficient, forming regression lines for ungrouped data.
12. Computation of correlation coefficient, forming regression lines for grouped data.
- 13. Computation of correlation coefficient, forming regression lines using MS Excel.**
14. Computation of multiple and partial correlation coefficients.
- 15. Computation of multiple and partial correlation coefficients using MS Excel.**
16. Computation of correlation ratio

## **B.Sc Statistics Semester- IV Syllabus**

**(With Mathematics Combination)**

**(Examination at the end of Semester)**

**With effect from Academic Year – 2016-17**

**Paper- IV: Testing of Hypothesis**

**(4 HPW with 4 credits and 100 marks)**

COURSE CODE:STAT401

### **Course Outcome:**

- To understand the concept of sampling distributions and their applications in statistical inference.
- To understand the process of hypothesis testing and its significance
- Importance of Standard Error and to draw conclusions using p-value

### **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  $\chi^2$ - test for specified variance, goodness of fit and test for independence of attributes ( $r \times s$ ,  $2 \times k$  and  $2 \times 2$  contingency tables). Tests of significance based on Student's 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.

## **B.Sc II Year Statistics Semester- IV**

**(With Mathematics Combination)**

**(Examination at the end of Semester IV)**

**Practical Paper- IV (with 2 HPW, Credits 1 and marks 25)**

1. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.
2. Small sample tests for single mean and difference of means and correlation coefficient.
3. Paired t-test.
4. **Small sample tests for mean(s), paired t-test and correlation coefficient using MS Excel.**
5. Small sample test for single and difference of variances.
6. **Small sample test for single and difference of variances using MS Excel.**
7.  $\chi^2$  – test for goodness of fit and independence of attributes.
8.  **$\chi^2$  – test for goodness of fit and independence of attributes using MS Excel.**
9. **Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample runs test.**
10. Nonparametric tests for two independent samples (Median test, Wilcoxon Mann Whitney - U test, Wald - Wolfowitz's runs test)



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(AUTONOMOUS)

B.Sc Statistics Semester –V Practical Syllabus  
(With Mathematics combination)

(Practical Examination at the end of the year)  
With Effect from Academic Year-2013-2014

Paper-III: APPLIED STATISTICS-I

LIST OF PRACTICALS

**ANOVA:**

1. ANOVA –one way classification with equal number of observations.
2. ANOVA – one –way classification with equal number of observations using MS-Excel.
3. ANOVA Two-Way classification with equal number of observations.
4. ANOVA Two-Way classification with equal number of observations using MS-Excel.

**Design of Experiments:**

5. Analysis of CRD. Analysis of RBD with and without missing observation.
6. Analysis of CRD. Analysis of RBD with and without missing observation using MS-Excel.
7. Analysis of LSD with and without missing observation.
8. Analysis of LSD with and without missing observation using MS-Excel.
9. Comparison of relative efficiency of CRD and RBD and comparison of relative efficiencies of LSD with RBD and CRD.

**Index Numbers:**

10. Computation of simple and all weighted index numbers.
11. Computation of reversal tests.
12. Construction of cost of living index number and wholesale index number.
13. Construction of fixed base and chain base index numbers.
14. Base shifting, Splicing and Deflation.
15. Computation of all weighted indices, cost of living index number, Base shifting, Splicing and Deflation using MS-Excel.

**Vital Statistics:**

16. Computation of various Mortality rates, Fertility rates and Reproduction rates.
17. Construction of Life Tables and Abridged life tables.
18. Construction of various rates, life tables and abridged life tables using MS-Excel.

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(Examination at the end of Semester)  
With Effect from Academic Year-2013-2014  
Paper-IV: OPERATION RESEARCH

Unit-I

**Linear Programming 1:**

Meaning and scope of OR. Convex sets and their properties. Definition of general LPP. Formulation of LPP. Solution of LPP by graphical method. Fundamental theorem of LPP (only statement).

(10 L)

Unit-II

**Linear Programming 2:**

Simplex algorithm. Concept of artificial variables. Big-M/Penalty method and two-phase simplex method. Concept of degeneracy and resolving it, Concept of duality, duality as LPP. Dual Primal relationship.

(15 L)

Unit- III

**Transportation:**

Definition of transportation problem, TPP as a special case of LPP, initial basic feasible solutions by North-West Corner Rule, Matrix minimum methods 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.

(15 L)

Unit- IV

**Assignment and Sequencing Problems:**

Formulation and description of Assignment problem and its variations. Assignment problem as special case of TP and LPP. Unbalanced assignment problem, traveling salesman problem. Optimal solution using Hungarian method.

Problems of Sequencing. Optimal sequence of N jobs on two and three machines without passing. (10 L)



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Paper-IV: OPERATION RESERACH

LIST OF PRACTICALS

**Operations Research**

1. Formulation and graphical solutions of LPP using different inequality type constrain.
2. Solution of LPP by simplex method.
3. Solution of LPP by simplex method using TORA.
4. Solution of LPP by Big-M and Two-Phase methods.
5. Solution of LPP by Big-M and Two-Phase methods using TORA.

**Transportation, Assignment and Sequencing :**

6. Initial basic feasible solution of Transportation problems using North Wes Corner rule, Matix minima methods and VAM.
7. Optimum solution of Transportation problem using North Wes Corner rule, Matix minima methods and VAM for IBFS using TORA.
8. Optimum solution to balanced and unbalanced Transportation problem by MODI method (both maximization and minimization problems).
9. Solution of balanced and unbalanced Assignment problem using Hungarian method (both maximization and minimization problems).
10. Solution of balanced and unbalanced Assignment problem using Hungarian method (both maximization and minimization problems) using TORA .
11. Solution for travelling salesman problem.
12. Solution of sequencing problem- Processing of n jobs through two machines and processing of n jobs through three machines.



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Paper-III: APPLIED STATISTICS-II

**Unit-I**

**Design of 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. Types of sampling: Subjective, probability and mixed sampling methods. (10 L)

**Unit-II**

Methods of drawing random samples with and without replacement. Estimates of population mean, total, and proportion, their variances and the estimates of variances in the following methods.

- i. SRSWR and SRSWOR
- ii. Stratified random sampling with proportional and Neyman allocation, and
- iii. Systematic sampling when  $N=nk$ .

Comparison of relative efficiencies. Advantages and disadvantages of above methods of sampling. (13 L)

**Unit-III**

**Times series:** - Times series and its components with illustrations, additive, multiplicative and mixed models. Determination of trend by least squares, 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. (12 L)

**Unit-IV**

**Demand Analysis:** Introduction. Demand and Supply, price elasticity of supply and demand. Methods of determining demand and supply curves, Leontief's, Pigou'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. (10 L)

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Paper-III: APPLIED STATISTICS-II

LIST OF PRACTICALS

**Sampling Techniques**

Estimation of population mean, population total and variance of these estimates by

1. Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR.
2. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.
3. Systematic sampling with  $N=nk$ . Comparison of systematic sampling with Stratified and SRSWOR

**Time Series Analysis:**

4. Measurements of trend by methods of Least Squares and Moving averages.
5. Measurement of trend by methods of Least Squares and Moving averages using MS-Excel.
6. Determination of Seasonal indices by method of Ratio to moving averages, Ratio to trend and Link relatives.
7. Determination of Seasonal indices by methods of Ratio to moving averages, Ratio to trend and Link relatives using MS-Excel.

**Demand Analysis**

8. Construction of Lorenz curve.
9. Fitting of Pareto law to an income data.
10. Construction of Lorenz curve using MS-Excel.

# COMPUTER SCIENCE

Semester – I

Subject: Computer Science Paper- I–Programming in C  
Theory

4 Hours/Week

4 credits

COURSE CODE:CS101

## 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–go to, 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, Scope 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 L
6. language

**B.SC I Year Examination Semester – I**  
**Subject: Computer Science**

**Paper- I–Programming in C**

**COURSE CODE:CS102**

**Credit :1**

Course  
Outcome:

1. Know concepts in problem solving .
2. To do programming in C language .
3. To write diversified solutions using C language.

**C LAB(SEMESTER –I)**

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.

## **B.SC I Year Examination Semester – II**

**Subject: Computer Science Paper- Programming in C++**  
**COURSE CODE:CS201**

### 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.

**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++

## **B.SC I Year Examination Semester – II**

**Subject: Computer Science Paper- II–Programming in C++**  
**COURSE CODE:CS201**

### 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.

**B.Sc II YEAR**

**Semester-III Subject: Computer Science**

**Paper-II (A): OOPs with Java**

**COURSE CODE:CS301**

**P.P.W: 7(4Th+3Pr)**

**Credits: 3Th+1Pr**

**Course Outcome:**

1. Use object oriented programming concepts to solve real world problems.
2. Explain the concept of class and objects with access control to represent real world entities.
3. Demonstrate the behavior of programs involving the basic programming constructs like Control structures, constructors, string handling and garbage collection
4. Use overloading methodology on methods and constructors to develop application programs.
5. Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords.
6. Describe the concept of interface and abstract classes to define generic classes.
7. Use dynamic and static polymorphism to process objects depending on their class.
8. Illustrate different techniques on creating and accessing packages (fully qualified name and import statements).
9. Understand the impact of exception handling to avoid abnormal termination of program using checked and unchecked exceptions.



# SYLLABUS

**UNIT-I : Java Fundamentals:** Fundamentals of OOPs(OOPs), Object Oriented paradigm, basic concepts of OOPs, Benefits of OOPs, Applications of OOPs.

**Java Evolution:** Java Features, How java differs from C and C++, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements, Java Environment.

**Overview of Java Language:** Simple Java Program, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments.

## **UNIT – II:**

**Constants, Variables and Data Types:** Constants, Variables, Data Types, Declaration of variables, giving values to variables, Scope of Variables, Symbolic Constants, Type Casting.

**OOPs Concepts in Java:** Operators and expressions-Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise, Special Operators, Arithmetic Expressions, Evolution of Expressions, Precedence of Arithmetic Operators, Operator precedence and Associativity.

**Decision Making and Branching:** Decision Making with IF Statement, Simple IF Statement, IF-ELSE Statement, Nested IF-ELSE Statement, ELSE-IF Ladder, The Switch statement.**UNIT - III:**

**Decision Making and Looping:** The While Statement, The do statement, the For Statement, Jump Statements.

**Class Object and Methods:** Defining a Class, Fields Declaration, Methods Declaration, Creating Objects, Accessing Class Members, Constructors, Method Overloading, Static Members, Nesting of Methods, Inheritance, Overriding Methods, Final Variables and Methods, Final Classes, Abstract Methods and Classes, Visibility Control.

## **UNIT - IV:**

**Arrays, Packages and Interfaces in Java:** Arrays, Strings and Vectors: creating an Array, One Dimensional Arrays, Two dimensional Arrays, Strings, Vectors, Wrapper Classes, and Enumerated Types.

**Interfaces:** Multiple Inheritance: Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables.

**Packages:** Java API Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package using Packages, Adding a Class to a Package, Hiding Classes, Static Import.

**Suggested Books:** Java Complete reference:

Java 2.0:Ivan Bayross

Java Tutorial: Sun microsystems

Special edition using Java 2:Joseph L.Weber

**Prescribed Books:**

Programming with Java A Primer fourth edition : Balagurusamy 4<sup>th</sup> edition  
The Complete Reference Java 2.0:

## B.Sc. II Year Practical Question Bank

### SEMESTER-III

#### Subject: Computer Science Paper: II (A) OOPs with Java

#### Course Outcome:

1. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. Be aware of the important topics and principles of software development.
4. Have the ability to write a computer program to solve specified problems.
5. Be able to use the Java SDK environment to create, debug and run simple Java programs.

#### Practical Question Bank

1. Write a java program to determine the sum of the following harmonic series for a given value of 'n'.  
 $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$ .
2. Write a program to perform the following operations on string through interactive input.
  - i. Sort given Strings in alphabetical order.
  - ii. Check whether one String is Sub String of another String or not.
  - iii. Convert the Strings to uppercase.
3. Write a program to simulate on-line shopping.
4. Write a program to identify a duplicate value in vector.
5. Create two threads such that one of the thread print even no's and other prints odd no's up to a given range.
6. Define an exception called "Marks Out of Bound" Exception, that is thrown if the entered marks are greater than 100.
7. Write a Java program to shuffle the list elements using all the possible permutations.
8. Create a package called "Arithmetic" that contains methods to deal all arithmetic operations. Also, write a program to use the package.
9. Write an Applet program to design a simple calculator.
10. Write a program to read a text and count all the occurrences of a given word. Also display their positions.

11. Write an applet illustrating sequence of events in an Applet.
12. Illustrate the method of overriding in Java.
13. Write a program to fill elements into a list. Also, copy them in reverse order into other list.
14. Write an interactive program to accept name of person and validate it. If the name contains any numeric value throw an exception "Invalid Name".
15. Write an applet program to insert the text at the specified position.
16. Prompt for the cost price and selling price of an article and display the profit (or) loss percentage.
17. Create an anonymous array in Java.
18. Create a font animation application that change the colors of text as and when prompted.
19. Write an interactive program to wish the user at different hours of the day.
20. Simulate the library information system i.e. maintain the list of books and borrower's details.



**Course Outcome:**

1. Be able to use the HTML programming language.
2. Resolves written HTML codes.
3. Runs the page he/she has designed using HTML codes.
4. Be able to use the Design Programs.
5. Uses Microsoft Expression Web 4 programme.
6. Designs site and page via Microsoft Expression Web 4 programme.
7. Uses the program Web Page Maker.

**SYLLABUS**

**UNIT-I:**

Introduction to internet, applications of internet, Web Browser, various Web Browsers and Client- Server Techniques.

**UNIT-II**

**Introduction to HTML:**

Basics-Introduction to HTML (Hypertext markup language)-Structure of HTML-Formatting tags-Physical tags-Logical tags -Header tags.

**UNIT-III**

**Creating tables:**

Creating Tables-Adding Borders- Cell Padding- Cell Spacing- Spanning- Using Colors-Aligning Tables in web Pages- Using Images in tables- Nesting Tables.

**P.P.W: 7(4Th+3Pr)**

**Credits: 3Th+1Pr**

## SYLLABUS

### UNIT – I

**Multithreaded programming and Applets:** Multithreaded Programming, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, and Synchronization.

**Managing Errors and Exceptions:** Types of Errors, Exceptions Syntax of Exception Handling code, multiple Catch statements, Using Finally Statement, Throwing our own Exceptions, Using Exceptions for Debugging. UNIT – II

**Applet Programming:** Introduction to Applets, How Applets Differ from Applications, Building an Applet Code, Applet Life Cycle, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running an Applet.

### UNIT – III

**Data Structures:** Sorting, Bubbles Sort, Selection Sort, Insertion Sort, Quick Sort

**Stacks and Queues:** Stacks, Queues, Circular Queue, Deques, Priority Queue Parsing Arithmetic Expressions.

**Linked List:** Simple Linked List, Finding and Deleting Specified Links, Double Ended list, Abstract Data types, Sorter List, Doubly Linked Lists.

### UNIT – IV

**Binary Trees:** Tree Terminology, Finding a Node Traversing the tree, Finding Maximum and Minimum values, Deleting a Node, Efficiency of Binary Trees, Trees Represented as Arrays.

**Graphs:** Introduction to Graphs, Search, and Minimum Spanning Tree, Topological Sorting with Directed Graphs, Connectivity in Directed Graphs.

## **B.Sc. II Year Practical Question Bank Semester-IV**

**Subject: Computer Science**

**Paper: II (B) Java with Data Structures**

**COURSE CODE:CS401**

### **Course Outcome:**

1. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2. Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. Be aware of the important topics and principles of software development.
4. Have the ability to write a computer program to solve specified problems.
5. Be able to use the Java SDK environment to create, debug and run simple Java programs.

### **PRACTICAL QUESTION BANK**

1. Program to create, insert, delete and display operations on single linked list.
2. Program to create, insert, delete and display operations on double linked list.
3. Program to create, insert, delete and display operations on circular single linked list.
4. Program to split a single link list.
5. Program to reverse a single linked list.
6. Program to implement insertion sort.
7. Program to implement PUSH and POP operations on Stack using array method.
8. Program to implement PUSH and POP operations on Stack using Linked List method.
9. Program to implement insert and delete operations on Queue using array method.
10. Program to implement insert and delete operations on Queue using Linked List method.
11. Program to implement insert and delete operations on Priority Queue.



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(Examination at the end of Semester)  
With Effect from Academic Year-2013-2014  
Paper-IV: QUALITY AND RELIABILITY

Unit-I

**Statistical Quality Control I**

Importance of SQC in industry. Process and Product Control, Statistical basis of Shewart control charts,  $3\sigma$  Control Limits, Tools for S.Q.C, Construction of control charts for variables (mean, range and standard deviation) (12 L)

Unit-II

**Statistical Quality Control II**

*Control charts for*  
Attributes (p, np and c- charts with fixed and varying sample sizes). Interpretation of control charts. Natural tolerance limits and specification limits, process capability index. Concept of Six sigma and its importance. Comparison between  $3\sigma$  and  $6\sigma$  limits. (13 L)

Unit-III

**Acceptance sampling plans:**

Concept of AQL and LTPD. Producer's 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. (10 L)

Unit-IV

**Reliability:**

*to 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. (10 L)

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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

B.SC. COMPUTER SCIENCE

SEMESTER-V

SUBJECT: MDBMS-I

PAPER-V

SYLLABUS

Hrs: (3Th+3Pr)

**Unit-I : Database Systems Introduction and Fundamentals.**

Database Systems: Introducing the database and DBMS, Why the database is important, Historical Roots: Files and File Systems, Problems with File System Data Management, Database Systems.

Data Models: The importance of Data models, Data Model Basic Building Blocks, Business Rules, The evaluation of Data Models, Degree of Data Abstraction.

**Unit -II : The Relational Database Model and Data Modeling:**

A logical view of Data, Keys, Integrity Rules, Relational Set

Operators, The Data Dictionary and the system catalog, Relationships within the Relational Database, Data Redundancy revisited, Indexes, Codd's relational database rules.

Entity Relationship Model: The ER Model, Developing ER Diagram, Database Design

Challenges: Conflicting Goals.

**Unit-III : Advanced Data Modeling Normalization**

The Extended Entity Relationship Model, Entity clustering, Entity integrity: Selecting Primary keys, Design Cases: Learning Flexible Database Design. Normalization of database tables: Database Tables and Normalization, The need for Normalization, The Normalization Process, Improving the design, Surrogate Key Considerations, High level Normal Forms, Normalization and database design, denormalization.

**Unit-IV : Interaction with Databases and Construction of Information System**

Introduction to SQL: Data Definition Commands, Data Manipulation Commands, Select queries, Advanced Data Definition Commands, Advanced Select queries, Virtual Tables, Joining Database Tables.

**Prescribed Text Book:**

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)

**Suggested Text Books:**

1. S.Kishore, ADBMS
2. Henry Korth



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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

B.SC COMPUTER SCIENCE

SEMESTER-VI

SUBJECT: MDBMS-II

PAPER - VII

SYLLABUS

Hrs: (3Th+3Pr)

**Unit-I : Advanced SQL and Database Design:**

Relational Set Operators, SQL Join Operators, Subqueries and correlated queries, SQL Functions, Oracle Sequences, Updatable Views, and Procedural SQL.

The Information System, The Systems Development Life Cycle, The Database Life Cycle, Database Design Strategies, Centralized Vs Decentralized design.

**Unit-II : Transaction Management in DBMS Environment.**

Transaction Management and Concurrency Control: What is transaction, Concurrency control, Concurrency control with locking Methods, Concurrency control with time stamping methods, concurrency control with optimistic methods, database recovery management.

**Unit – III: Distributed Database Management Systems:**

The evolution of Distributed Database Management Systems, DDBMS advantages and Disadvantages, Distribution Processing and Distribution Databases, Characteristics of Distributed database management systems, DDBMS Components, Levels of Data and Process distribution, Distributed database Transparency Features, Distributed Transparency, Transaction Transparency, Performance Transparency and Query Optimization, Distributed Database Design, Client Server VS DDBMS.

**Unit-IV : Data Warehouse Concepts and Database Administration.**

The Data Warehouse: The need for data analysis, Decision support systems, The data warehouse, Online analytical processing, Star schemas, Data mining, SQL extension for OLAP.

Database Administration: Data as a Corporate asset, The need for and role of databases in an organization, The evolution of the database administration function, The database environment's Human Component, Database administration Tools, The DBA at work: Using Oracle for Database Administration.

**Prescribed Text Book:**

1. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)



GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD – 16  
(An Autonomous college of Osmania University)

Re-Accredited by NACC with 'B' Grade

DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

B.Sc COMPUTER APPLICATIONS

SEMESTER-V. PAPER ,VI

SUBJECT: WEB TECHNOLOGIES

SYLLABUS

Hrs:(3T+3PR)

#### UNIT-1

Introduction: HTML, XML, and the World Wide Web.

HTML: Basic HTML, The Document body, Text, Hyperlinks, Adding more formatting, Lists, Tables, Using colors and images, Images.

More HTML: Multimedia objects, Frames, Forms-towards interactivity, The HTML document

Head in detail, XHTML- An evolutionary markup.

#### UNIT-2

Cascading Style Sheets: Introduction, Using styles: Simple examples, Defining your own styles,

Properties and values in styles, Style sheets- A worked example, Formatting blocks of

information, Layers.

#### UNIT-3

An introduction to Java Script: What is dynamic html, Java Script, Javascript—The basics,

Variables, String manipulation, Mathematical functions, Statements, Operators, Arrays,

Functions.

#### UNIT-4

Objects in Java Script: Data and objects in java script, Regular expressions, Exception Handling,

Built in objects, Events.

#### Suggested Books:

Prescribed Books: HTML,DHTML,JAVASCRIPT,PERL,CGI:Ivon bayross

The complete reference Webdesign:Thomas A.Powel

Reference Books:Scripting Language and Webdesigning:R.singh,Mamatha varma.s.Mahindru

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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

B.Sc. COMPUTER APPLICATIONS

SEMESTER-VI PAPER- VIII

SUBJECT: WEB TECHNOLOGIES

SYLLABUS

Hrs: (3T+3PR)

**UNIT-1**

Dynamic HTML with Java Script: Data validation, Opening a new window, Messages and Confirmations, The status bar, writing to a different frame, Rollover buttons, Moving images, Multiple pages in a single download, A text-only menu system, Floating logos.

**UNIT-2**

Active Server Pages and Java: Active Server Pages, Java.

XML: Defining Data for Web applications: Basic XML, Document type definition, XML

Schema, Document Object Model, Presenting XML

**UNIT-3**

Good Design: Structure, Tables versus Frames, Accessibility, Internationalization, Exercises.

Useful Software: Web browsers, Perl, Web servers, mod\_perl, Databases, Accessing your ISP, Exercises.

**UNIT-4**

Protocols: Protocols, IP and TCP, Hyper Text Transfer Protocol, Common Gateway Interface,

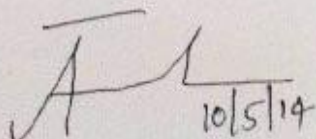
The Document Object Model, introducing the Document Object Model, Exercises

**Suggested Books:**

Prescribed Books: HTML, DHTML, JAVASCRIPT, PERL, CGI: Ivon bayross

The complete reference Webdesign: Thomas A. Powel

Reference Books: Scripting Language and Webdesigning: R. Singh, Mamatha varma. s. Mahindru

  
10/5/14

# Botany

## **First Year, I -Semester**

### **Paper-I**

#### **Microbial Diversity and Lower Plants**

**DSC - 1A (4 hrs./week) Credits- 4**

**Theory Syllabus (60 hours)**

**Course Code:BOT101**

#### **Course Outcomes**

After completion of the course the student is able to:

CO1.Understand the characteristics of bacteria and viruses

CO2. Identify the characteristics of algae

CO3. Understand the classification and characteristics of fungi

CO4. Identify the classification and characteristics of bryophytes

CO 5.Understand the morphological diversity of Bryophytes and Pteridophytes

CO 6. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.

Co7. Know the evolution of Bryophytes and Pteridophytes

#### **UNIT – I (15 hours)**

- 1) Bacteria: Structure, nutrition, reproduction and economic importance. Brief account of Archaeobacteria, 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 to Angular 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) Mastigomycotina- *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 characters of Pteridophytes**, Structure, reproduction, life cycle and systematic position of *Rhynia*, *Lycopodium*, *Equisetum* and *Marsilea*.

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

#### References:

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.

3) 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.

## 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.

## First Year, II -Semester

### Paper-II

### Gymnosperms, Taxonomy of Angiosperms and Ecology

#### DSC-1B Credits-4

#### Theory Syllabus (60 hours)

#### Course Code: BOT201

#### Course Outcome

After completion of the course the student is 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, types, development and functions of various ecosystems and their communication.

CO9. Study of herbarium techniques.

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

#### UNIT-I (15 hours )

1) Gymnosperms: **General characters of 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 Zingiberaceae.

## 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 seral stages, modification of environment, climax formation with reference to Hydrosere and Xerosere.

## **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.





#### **UNIT-IV**

**(16h)**

- Pollen morphology, pollination and fertilization, Pollination Types, Pollen – pistil interaction, Double fertilization.
- Seed – structure appendages and dispersal mechanisms
- Endosperm – Development and types. Embryo development and types; Polyembryony and Apomixis – anoutline.
- Palynology: Pollen morphology, NPC system, Applications of Palynology.

## **B.Sc. BOTANY**

### **II Year: Semester-III**

#### **Paper – III: Plant Anatomy and Embryology**

**DSC-1C**

**Credits-1**

#### **Practical syllabus(45 hours)**

- Demonstration of double staining technique.
- Tissue organization in root and shoot apices using permanent slides
- Preparation of double stained Permanent slides
  1. Primary structure: Root - *Cicer*,  
*Canna*; Stem-*Tridax*, *Sorghum*  
Secondary structure: Root – *Tridax*  
sp.; Stem-*Pongamia*
  2. Anomalous secondary structure: Examples as given in theory syllabus.
- Anatomy of Xerophyte (*Nerium* leaf); Hydrophyte (*Hydrilla* stem).
- Stomatal types using epidermal peels.
- Structure of anther and microsporogenesis using permanent slides.
- Structure of pollen grains using whole mounts - *Hibiscus*, *Acacia* and Grass).
- Pollen viability test using Evans Blue –*Hibiscus*
- Study of ovule types and developmental stages of embryosac.
- Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot embryos using permanent slides.
-

## **II YEAR: Semester-IV**

### **Paper IV: Cell Biology, Genetics and Plant Physiology**

**DSC-1D Credits-4**

**Course Code: BOT401**

#### **Theory Syllabus (60 hours)**

##### Course Outcome

After completion of the course the student is able to:

CO1. To explain the structure of Cell components and their functions.

CO2 .To describe cell division in plants.

CO3. To have knowledge of the nature and function of genes, processes of inheritance .

CO4. To describe linkage , crossing over and mutations .

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

CO 6. Explain chemical properties and deficiency symptoms in plants

CO 7. Explain the significance 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)

- 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.
- Linkage and crossing over, Recombination frequency, two factor and three factor crosses; Interference and coincidence. Numericals based on gene mapping; Sex Linkage.

- Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy
- Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens-physical and chemical (Base analogs, deaminating, alkylating and inter chelating agents);

### Unit-III (15h)

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

### UNIT- IV (15h)

- Photosynthesis: Photosynthetic pigments, Cyclic and Non-cyclic Photo phosphorylation. Carbon assimilation pathways: C<sub>3</sub>, C<sub>4</sub> and CAM.
- Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle and oxidative phosphorylation.
- Nitrogen Metabolism: Biological nitrogen fixation. **Protein Synthesis, Mechanism of Protein Synthesis.**
- Physiological role of Phytohormones: Auxins, gibberellins, cytokinins, ABA, ethylene and Brassinosteroids



## 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

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET -HYDERABAD.  
(AUTONOMOUS)

DEPARTMENT OF BOTANY

Syllabus-Total Hrs of Teaching 44

B.sc. III YEAR -SEMESTER-V -PAPER-V (2014-15) SYLLABUS

(CELL BIOLOGY AND GENETICS)

CELL BIOLOGY:-

- UNIT-I-1. PLANT CELL ENVELOPS:- Ultra structure of cell wall, molecular organization of cell membranes.
2. NUCLEUS:- Ultrastructure, Nucleic acids- structure and replication of DNA ; types and functions of RNA. (9hrs)
- UNIT-II- 1. CHROMOSOMES:- Morphology ,Organisation of DNA in a chromosome, Euchromatin and heterochromatin Karyotype.
2. SPECIAL TYPE OF CHROMOSOMES:- Lampbrush, polytene and B- chromosomes.
3. CELL DIVISION:- Cell cycle and its regulation; Mitosis, Meiosis and their significance. (13Hrs)

GENETICS:-

- UNIT-III-1. MENDELISM:- Laws of inheritance, Genetic interactions-Epistasis, complimentary, supplementary and Inhibitory genes.
2. LINKAGE AND CROSSING OVER:- A brief account , constructuion of genetic maps, 2-point and 3-point Test cross data. (8Hrs)
- UNIT-IV- 1. MUTATIONS:- Chromosomal aberrations-structural and numerical changes; Gene mutations.
2. GENE EXPRESSION:- Organisation of gene, transcription, translation, mechanism and regulation Of gene expression in prokaryotes(Lac and Trp operon).
3. EXTRA NUCLEAR GENOME:- Mitochondrial and plastid DNA , Plasmids. (14Hrs)

1. *hu*  
Apr 11, 2014

4. *M. Lalagoud*

2. *Deep (Dr. D. S. Reddy)*

3. *Shahin*

GOVERNMENT DEGREE COLLEGE FOR WOMEN BEGUMPET -HYDERABAD.  
(AUTONOMOUS)

Syllabus-Total Hrs of Teaching 46

B.sc. III YEAR -SEMESTER-V -PAPER-V I (2014-15) SYLLABUS

(ECOLOGY AND BIODIVERSITY)

ECOLOGY:-

UNIT-I-1. CONCEPTS <sup>and</sup> COMPONENTS OF ECOSYSTEM:- Energy flow , food chains, food webs, ecological pyramids,  
Biogeochemical cycles-Carbon, Nitrogen, Phosphorous.

2. PLANTS AND ENVIRONMENT:- Ecological factors- Climatic (light and temperature), edaphic and biotic.  
Ecological adaptations of plants. (15 Hrs)

UNIT-II-1- POPULATION ECOLOGY:- Natality, mortality, growth curves, ecotypes and ecads.

2. COMMUNITY ECOLOGY:- Frequency, density, cover, lifeforms, biological spectrum, ecological succession  
(Hydrosere , xerosere).

3. PRODUCTION ECOLOGY:- Concepts of productivity, GPP, NPP, CR (Community Respiration) and  
Secondary production, P/R ratio and ecosystems. (10 Hrs)

BIODIVERSITY AND CONSERVATION:-

UNIT-III -1. BIODIVERSITY; Concepts, convention on biodiversity-Earth Summit. Types of Biodiversity.

2. BIODIVERSITY:- Levels , threats and value of biodiversity. (8Hrs)

UNIT-IV-1. HOT SPOTS OF INDIA:- Endemism, North Eastern Himalayas , Western Ghats.

2. AGROBIODIVERSITY:- Vavilov centres of crop plants.

3. PRINCIPLES OF CONSERVATION:- IUCN threat- categories, RED data book- threatened & endangered  
Plants of India. Role of organizations in the conservation of biodiversity-IUCN, UNEP, WWF & NBPGR.

1. *Ru* April 11, 2014 (13Hrs)

2. *Deep Chandrasekhar, MCAUGO*

3. *Shalini S*







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

DEPARTMENT OF BOTANY

Syllabus-Total Hrs of Teaching 42

B.sc. III YEAR -SEMESTER-VI -PAPER-V III (2014-15) SYLLABUS

(TISSUE CULTURE & BIOTECHNOLOGY, SEED TECHNOLOGY & HORTICULTURE)

TISSUE CULTURE & BIOTECHNOLOGY:-

UNIT-I -TISSUE CULTURE:1.-Introduction,sterilization procedures,culture media-composition and preparation;expla

2. Callus culture;cell and protoplast culture,somatic hybrids and cybrids

3. Application of tissue culture: production of pathogen free plants and somaclonal variants,production of

Stress resistance plants,secondary metabolites and synthetic seeds.

(12 Hrs)

UNIT-II-BIOTECHNOLOGY:- 1. Introduction , history and scope.

2. DNA technology: vectors and gene cloning and transgenic plants.

(10 Hrs)

SEED TECHNOLOGY AND HORTICULTURE:

UNIT-III.1. SEED; Structure and types.Seed dormancy;causes and methods of breaking of dormancy.

2. SEED STORAGE:- Seed banks,factors affecting seed viability,genetic erosion,seed production technology

Seed testing and certification.

(8 Hrs)

UNIT-IV- HORTICULTURE TECHNIQUES: 1.Introduction,cultivation of ornamental and vegetable crops;

Bonsai and landscaping.

2.Floriculture: Introduction,Importance of green house,polyhouse,mist chamber,shade nets,

Micro irrigation systems. Floriculture potential and its trade in India.

3. Vegetative propagation of plants: Stem,root and leaf cuttings. Layering and bud grafting. Role of plant

growth regulators in horticulture.

(12 Hrs)

1. *Dr. Anil Kumar*  
April 11, 2014

4. *M. Lalagad*

2. *Dr. P. S. Srinivas Reddy*

3. *Shalini*

101

# Zoology

## SEMESTER –I

**COURSE CODE: ZOO101**

### **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 Nematelminthes**

- 2.3.1 General characters
- 2.3.2 Classification of Nematelminthes 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, Aurelia, Physalia, Velella, Corallium, Gorgonian, Pennatula

**iv.Plathyhelminthes:** Planaria, Fasciola hepatica, Fasciola larval forms – miracidium, redia, cercaria, Echinococcus granulosus, Taenia solium, Schistosoma haematobium.

**v.Nemathelminthes:** Ascaris ( male & female ), Dracunculus, Ancylostoma, Wuchereria.

**vi. Annelida:** Nereis, Aphrodite, Chaetopteurs, Hirudinaria, Trochopore larva.

**vii. Arthropoda:** Cancer, Palaemon, Scorpion, Scolopendra, Sacculina, Limulus, 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, Ophiotrix, 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.**

## **SEMESTER –II**

**COURSE CODE: ZOO201**

### **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.

## **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*, *Chamaeleon*, *Gecko*, *Uromastix*, *Vipera russelli*, *Naja*, *Bungarus*, *Enhydrina*, *Typhlops*, *Testudo*, *Trionyx*, *Crocodylus*, *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

## **SEMESTER –III**

### **Module –III /Core-III**

**COURSE CODE: ZOO301**

## **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**

1.1.1 Enzymes: 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**

1.2.1 Classification 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 Periods)**

**(15**

### **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<sub>2</sub>, Chloride shift;

2.2.3 Regulation of respiration – nervous and chemical mechanism

### **2.3 CIRCULATION**

2.3.1 Types of circulation - Open and Closed circulation

2.3.2 Structure of Mammalian Heart, Types of hearts – neurogenic and myogenic;

2.3.3 Heart function – Conduction and regulation of heart beat, Regulation of Heart rate

2.3.4 Tachycardia and Bradycardia: Blood Clotting mechanism

### **UNIT – III periods)**

**(15**

### **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



### **3.3 ENDOCRINE 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)**

## **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.

## **SEMESTER –IV**

**COURSE CODE: ZOO401**

### **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)**

**(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.**



Govt. Degree College For women  
(Autonomous)  
Begumpet, Hyderabad.  
Subject: Zoology.

Semester V  
Theory Paper: III  
Animal physiology-I and Organic Evolution.  
(2014-2015)

### Unit I

#### Physiology of digestion.

60hrs

- 1.1. Definition of digestion and types of digestion- extra and intra cellular.
- 1.2. Digestion of carbohydrates, proteins, lipids and cellulose digestion.
- 1.3. Absorption and assimilation of digested food materials.
- 1.4. Gastrointestinal hormones – control of digestion.

(3hrs per week)

#### Physiology of respiration

- 1.1. Types of respiration-external and internal respiration.
- 1.2. Structure of mammalian lungs and gaseous exchange.
- 1.3. Transport of oxygen- formation of oxyhaemoglobin and affinity of haemoglobin for oxygen.  
Oxygen dissociation curves.
- 1.4. Transport of  $\text{CO}_2$ -chloride shift, Bohr Effect.

### Unit-II

#### Physiology of Circulation

- 2.1. Open and closed circulation. Working mechanism of mammalian heart. Heart beat and cardiac cycle. Myogenic and neurogenic hearts.
- 2.2. Regulation of heart rate- Tachycardia and Bradycardia.

#### Physiology of excretion

- 2.4. Definition of excretion. Forms of nitrogenous waste material and their formation. Classification of animals on the basis of excretory products.
- 2.6. Structure and function of Nephron –Counter Current mechanism.

### Unit-III

#### Organic Evolution

- 3.1. Genetic basis of Evolution, Gene Pool and gene frequencies, Hardy-Weinberg's Law, Natural selection Genetic drift, Mutation, Isolation and Migration.
- 3.2. Speciation-Allopatry and Sympatry.

*G. R. Rao*  
Chairperson  
Board of Studies  
Zoology

*A. V. Rao*  
9/4/14

*Am. Rao*

*A. V. Rao*

Govt. Degree College for Women,  
(Autonomous)  
Begumpet, Hyderabad,  
Subject: Zoology.

Semester- VI  
Theory Paper- III  
Animal Physiology-II and Genetics.  
(2014-2015)

#### Unit I

##### physiology of muscle contraction.

60hrs

- (3hrs per week)
- 1.1. General structure and types of muscles.
  - 1.2. Ultra structure of skeletal muscle.
  - 1.3. Sliding filament mechanism of muscle contraction.
  - 1.4. Chemical changes during muscle contraction- role of calcium, ATP utilization and its replenishment.

##### Physiology of nerve impulse.

- 1.5. Structure of nerve cell.
- 1.6. Nature of nerve impulse-resting potential and action potential.
- 1.7. Conduction of nerve impulses along an axon.
- 1.8. Structure of synapse, mechanism of synaptic transmission.

#### Unit II

##### Physiology of endocrine system.

- 2.1. Hormones of hypothalamus.
- 2.2. Hormones of pituitary gland (adenohypophysis and neuro hypophysis).
- 2.3. Hormones of pineal gland, thyroid gland, Para thyroid, thymus, adrenal and pancreas.
- 2.4. Endocrine control of mammalian reproduction- male and female hormones- hormonal control of menstrual cycle in humans.

#### Unit III

##### Genetics

- 3.1. Mendel's laws- law of segregation and independent assortment, genetic interaction- incomplete dominance, co-dominance and epistasis.
- 3.2. Central dogma of molecular biology- brief account of DNA replication (semi conservative method). Replication fork (continuous and dis continuous synthesis).
- 3.3. Transcription- brief account, initiation, elongation and termination in eukaryotes. Translation- genetic code- gene regulation as exemplified by lac operon.
- 3.5. Human karyotyping, amniocentesis, chromosomal disorders.

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9/4/14

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Govt. Degree College for Women.  
(Autonomous)  
Begumpet, Hyderabad.  
Subject: Zoology.

Semester- V  
Theory Paper- IV  
AQUACULTURE AND FISHERIES  
(2014 - 2015)

**Unit-I**

60hrs

- (3hrs per week)
- 1.1 Introduction to aquaculture.
  - 1.2 Types of fisheries-capture and culture fisheries.
  - 1.3 Finfish fisheries and shell fish fisheries, Site selection criteria.
  - 1.4 Reproductive system of fish life cycle-Spawn, fry, fingerlings and stock fish.
  - 1.5 Fishery resources from fresh water, brackish water and marine habitats.
  - 1.6 Fresh water, brackish water and mariculture (special reference to prawn and oysters).
  - 1.7 Fishing crafts and fishing gears.

**Unit-II**

**Aquaculture Systems**

- 2.1. Indore rearing systems-Indoor recirculation and Outdoor recirculation systems. Fish farming methods.
- 2.2. Induced breeding-importance of induced breeding process of hypophysation with ex. common carp fishes.
- 2.3. Hatchery design and management.
- 2.4. Construction and Management of fish pond.
- 2.5. Bund breeding and types of bunds.
- 2.6. Management of nursery, rearing and stocking ponds with special reference to pre-stocking, stocking and post stocking measures.

**Unit-III**

- 3.1. Larval rearing in different ponds of the Hatchery.
- 3.2. Seed transport, seed production-incubation and Hatching different kinds of incubators.
- 3.3. Fish products-primary and secondary products.
- 3.4. Common diseases and control.
- 3.5. Post harvest technology-preservation of fishes, prawn by drying, salting, pickling and scientific methods like freezing, canning.

*T. S. Reddy*  
Chairperson

Board of Studies  
OF ZOOLOGY

*Dr. Kishor*  
9/4/14

*M. S. Reddy*

*A. V. Reddy*

Govt. Degree College for Women,  
(Autonomous)  
Begumpet, Hyderabad.  
Subject: Zoology.

Semester- VI  
Theory Paper- IV  
Clinical science and Animal Biotechnology  
(2014- 2015)

### Unit-I

#### Hematology

60hrs

- 1.1. Blood composition and functions.
- 1.2. Blood grouping and transfusion problems.
- 1.3. Blood diseases-Anemia, Leukemia, Leucocytosis and Leucopenia.
- 1.4. Biopsy and autopsy-Clinical importance.

(3hrs per week)

### Unit-II

#### Immunology and Human Parasites

- 2.1. Types of immunity-Innate and acquired.
- 2.2. Antigens-Haptens and epitopes and their properties.
- 2.3. Structure and biological properties of human immunoglobulin G (IgG).
- 2.4. Hypersensitivity-immediate and delayed
- 2.5. Blood parasites-Only structure and Clinical significance of Plasmodium. (No life history).
- 2.6. Intestinal parasites-Only Structure and Clinical significance of Entamoeba, Giardia, Taenia solium, Ancylostoma, Enterobius.(No life history).

### Unit-III

#### Animal Biotechnology:

- 3.1 Animal Biotechnology: Scope of Biotechnology, Cloning Vectors-Characteristics of Vectors, Plasmids.
- 3.2 Gene Cloning-Enzymatic Cleavage of DNA, Restriction enzymes (Endonucleases) and Ligation.
- 3.3. Transgenesis and Production of transgenic animals (Fish and Goat).
- 3.4 Application of Stem cell technology in cell based therapy (Diabetes and Parkinson's diseases)

*T. R. Reddy*  
9/4/14

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9/4/14

*A. V. Reddy*

*Indira*

Chairperson  
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A.P. 126



Govt. Degree College for Women.  
(Autonomous)  
Begumpet, Hyderabad.  
Subject: Zoology.

PRACTICAL PAPER-III  
ANIMAL PHYSIOLOGY, GENETICS & EVOLUTION  
(2014-2015)

ANIMAL PHYSIOLOGY

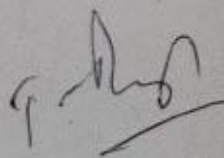
90 hrs

1. Identification of Carbohydrates, Proteins and Lipids.
2. Unit Oxygen Consumption in an aquatic animal (Fish & Crab)
3. Quantitative analysis of excretory products.
4. Demonstration of salivary amylase.

(3 hrs/week)

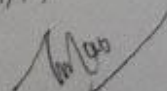
GENETICS

5. A, B, O blood group identification.
6. Problems based on Blood grouping.
7. Karyotyping of human chromosomes (Human karyotype figure on paper should be cut in to different sets of chromosomes and students are asked to arrange them in an order and Comment on the ideogram)
8. Identification of genetic syndromes given on charts.
9. Problems based on Mendelian inheritance (at least one problem for each for the laws of Segregation and law of independent assortment).



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9/9/14



A. V. Reddy

Govt. Degree College for Women,  
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Begumpet, Hyderabad.  
Subject: Zoology.

**PRACTICAL PAPER -IV  
FISHERIES AND AQUACULTURE  
(2014-2015)**

90 hrs  
(3 hrs/week)

- 1.0. Identification of important Freshwater and Marine edible fishes (Minimum 10).
- 2.0. Identification of important edible prawns (Minimum 5).

**FIELD WORK:**

Field work is compulsory. Field trip to local fisheries/ aquaculture unit is to be conducted and certified field note book should be submitted at the time of practical examination.

**CLINICAL SCIENCE:**

- 1.0. Identification of the following protozoan parasites.
  - a) *Entamoeba histolytica*
  - b) *intestinalis*
  - c) *Balantidium coli*
  - d) *Trypanosoma gambiense*
  - e) *Plasmodium*- Any two stages
- 2.0. Identification of the following helminth parasites.
  - a) *Taenia solium*
  - b) *Ascaris* (Male and female)
  - c) *Enterobius vermicularis*
  - d) *Dracanculus medinensis*
  - e) *Ancylostoma duodenale*
- 3.0. Blood cell counting-RBC and WBC
- 4.0. Estimation of Haemoglobin ( Sahil's Method)

**ANIMAL BIOTECHNOLOGY:**

- 1.0. Identification of vectors (charts or photographs)
- 2.0. Identification of Genetic disorders (charts or photographs)
- 3.0. Identification of Transgenic animals (charts or photographs)

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9/4/14

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UNIVERSITY

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# Chemistry

## SEMESTER WISE SYLLABUS

**COURSE CODE: CHE101**

**SEMESTER I  
Chemistry - I**

**Paper – 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<sub>2</sub>O, HOX, H<sub>2</sub>SO<sub>4</sub> with mechanism and addition of HBr in the presence of peroxide (Anti – Markonikov's addition). Oxidation (cis –

additions) – hydroxylation by KMnO<sub>4</sub>, OsO<sub>4</sub>, 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<sub>2</sub>, HX, H<sub>2</sub>O (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<sub>2</sub>. 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<sub>2</sub>O and C<sub>2</sub>H<sub>5</sub>OH - H<sub>2</sub>O 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-  $CO_3^{2-}$ ,

$Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $PO_4^{3-}$ ,  $BO_3^{3-}$ ,  $CH_3COO^-$ ,  $NO_3^-$ . 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.
  1. Chemistry of the elements by N.N.Greenwood and A. Earnshaw Pergamon Press 1989.
  1. Inorganic Chemistry by Shriver and Atkins 3rd edn Oxford Press 1999.
  1. Textbook of Inorganic Chemistry by R Gopalan.

## **Unit- II**

1. Organic Chemistry by Morrison and Boyd.
2. Organic Chemistry by Graham Solomons.
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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 by Lewis 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.

## **Unit-I (Inorganic Chemistry)**

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 of Solids, and its calculation, application of symmetry, solid characteristics of simple salts.

## 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**  
(week)

**45h (3 h /**

Analysis of two anions (one simple, one interfering) and two cations in the given mixture.

Anions:  $CO_3^{2-}$ ,  $SO_3^{2-}$ ,  $S^{2-}$ ,  $Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $CH_3COO^-$ ,  $NO_3^-$ ,  $PO_4^{3-}$ ,  $BO_3^{3-}$ ,  $SO_4^{2-}$ ..

Cations:  $Hg^{2+}$ ,  $Ag^+$ ,  $Pb^{2+}$

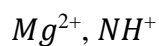
$Hg^{2+}$ ,  $Pb^{2+}$ ,  $Bi^{3+}$ ,  $Cd^{2+}$ ,  $Cu^{2+}$ ,  $As^{3+}/5+$ ,  $Sb^{3+}/5+$ ,  $Sn^{2+}/4+$

$Al^{3+}$ ,  $Cr^{3+}$ ,  $Fe^{3+}$

$Zn^{2+}$ ,  $Ni^{2+}$ ,  $Co^{2+}$ ,  $Mn^{2+}$

$Ba^{2+}$ ,  $Sr^{2+}$ ,  $Ca^{2+}$





## **II. Inorganic quantitative Analysis-Inorganic Preparations**

1. Tetraamine Copper (II) Sulphate
2. Potash alum  $KAl(SO_4)_2 \cdot 12H_2O$ ,

### **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 with techniques involved in preparation methods of inorganic metal complexes.

**Government Degree College for Women, Begumpet, Hyderabad**

**B.Sc I Yr CHEMISTRY SEMESTER WISE SYLLABUS**

**SEMESTER II**

**COURSE CODE: CHE201**

**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<sub>2</sub> (reaction with FeSO<sub>4</sub>, KMnO<sub>4</sub>, K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>), HNO<sub>3</sub> (reaction with H<sub>2</sub>S, Cu), HNO<sub>4</sub> (reaction with KBr, Aniline), H<sub>2</sub>N<sub>2</sub>O<sub>2</sub> (reaction with KMnO<sub>4</sub>). Redox properties of oxyacids of Phosphorus: H<sub>3</sub>PO<sub>2</sub> (reaction with HgCl<sub>2</sub>), H<sub>3</sub>PO<sub>3</sub> (reaction with AgNO<sub>3</sub>, CuSO<sub>4</sub>). Redox properties of oxyacids of Sulphur: H<sub>2</sub>SO<sub>3</sub> (reaction with KMnO<sub>4</sub>, K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>), H<sub>2</sub>SO<sub>4</sub> (reaction with Zn, Fe, Cu), H<sub>2</sub>S<sub>2</sub>O<sub>3</sub> (reaction with Cu, Au), H<sub>2</sub>SO<sub>5</sub> (reaction with KI, FeSO<sub>4</sub>), H<sub>2</sub>S<sub>2</sub>O<sub>8</sub> (reaction with FeSO<sub>4</sub>, KI). Redox properties of oxy acids of Chlorine.

**Interhalogens-** Classification- general preparation- structures of AB, AB<sub>3</sub>, AB<sub>5</sub> and AB<sub>7</sub> 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. Clathrate 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 SN1 and SN2. Mechanism and energy profile diagrams of SN1 and SN2 reactions. Stereochemistry of SN2 (Walden Inversion) 2-bromobutane, SN1 (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:** Preparation: 1°, 2° and 3° alcohols using Grignard reagent, Reduction of Carbonyl compounds, carboxylic acids and esters. Physical properties: H-bonding, Boiling point and Solubility. Reactions with Sodium, HX/ZnCl<sub>2</sub> (Lucas reagent), esterification, oxidation with PCC, alk. KMnO<sub>4</sub>, acidic dichromates, conc. HNO<sub>3</sub> 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, Reimer Tiemann reaction (Mechanism), Kolbe reaction (Mechanism), Gattermann-Koch reaction, Azo-coupling reaction, Schotten-Boumann reaction, Houben-Hoesch condensation, .

**Ethers:** Nomenclature, preparation by (a) Williamson's synthesis (b) from alkenes by the action of conc. H<sub>2</sub>SO<sub>4</sub>. Physical properties – Absence of Hydrogen bonding, insoluble in water, low boiling point. Chemical properties – inert nature, action of conc. H<sub>2</sub>SO<sub>4</sub> 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<sub>3</sub>

(b) HCN (c) RMgX (d) NH<sub>3</sub> (e) RNH<sub>2</sub> (f) NH<sub>2</sub>OH (g) PhNHNH<sub>2</sub> (h) 2,4-DNP (Schiff bases). Addition of H<sub>2</sub>O to form hydrate, chloral hydrate (stable), addition of alcohols - hemiacetal and acetal formation. Cannizzaro reaction. Oxidation reactions – KMnO<sub>4</sub> oxidation and auto oxidation, reduction – catalytic hydrogenation, mechanism of Clemmensen's reduction, Wolf-Kishner reduction, Meerwein-Ponndorf-Verly reduction. Reduction with LAH, NaBH<sub>4</sub>.

### **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 Kohlrausch's law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law - its uses and limitations. Debye-Huckel-Onsager'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 K<sub>a</sub> 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(KMnO<sub>4</sub>) 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<sup>2+</sup>

### **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<sub>n</sub> axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and dissymmetric 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 dissymmetric 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 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.
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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.

## 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  $NH^+$  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.



**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:** Comparison 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  $[\text{Ni}(\text{NH}_3)_4]^{2+}$ ,  $[\text{NiCl}_4]^{2-}$  and  $[\text{Ni}(\text{CO})_4]$  (b) Square planar complexes  $[\text{Ni}(\text{CN})_4]^{2-}$ ,  $[\text{Cu}(\text{NH}_3)_4]^{2+}$ ,  $[\text{PtCl}_4]^{2-}$  (c) Octahedral complexes  $[\text{Fe}(\text{CN})_6]^{4-}$ ,  $[\text{Fe}(\text{CN})_6]^{3-}$ ,  $[\text{FeF}_6]^{4-}$ ,  $[\text{Co}(\text{NH}_3)_6]^{3+}$ ,  $[\text{CoF}_6]^{3-}$ . Limitations of VBT. 3. Isomerism in coordination compounds, stereo isomerism – (a) Geometrical isomerism in (i) square planar metal complexes of the type  $[\text{MA}_2\text{B}_2]$ ,  $[\text{MA}_2\text{BC}]$ ,  $[\text{M}(\text{AB})_2]$ ,  $[\text{MABCD}]$  (ii) Octahedral metal complexes of the type  $[\text{MA}_4\text{B}_2]$ ,  $[\text{M}(\text{AA})_2\text{B}_2]$ ,  $[\text{MA}_3\text{B}_3]$  using suitable examples, (b) Optical isomerism in (i). Tetrahedral complexes  $[\text{MABCD}]$  (ii). Octahedral complexes  $[\text{M}(\text{AA})_2\text{B}_2]$ ,  $[\text{M}(\text{AA})_3]$  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  $\text{Ni}(\text{CO})_4$ . Structural features of  $\text{Ni}(\text{CO})_4$ ,  $\text{Fe}(\text{CO})_5$ ,  $\text{Fe}_2(\text{CO})_9$ ,  $\text{Fe}_3(\text{CO})_{12}$  and  $\text{Cr}(\text{CO})_6$  -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  $\text{Fe}(\text{CO})_5$

**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 and Amonolysis of acid halides, Acid anhydrides and esters (mechanism of ester hydrolysis by base and acid). Hydrolysis and dehydration of amides.

**Additional Inputs:** Comparison of acidic strength of carboxylic acid and alcohol

### **S3-O-2: Nitrohydrocarbons 3 h**

Preparation of Nitroalkanes. Reactivity - halogenation, reaction with HNO<sub>2</sub> (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  $\alpha$ -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). Electrophilic 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<sub>2</sub>, 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  $C_p - C_v = R$ . 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,  $PV^\gamma = \text{constant}$ . P-V curves for isothermal and adiabatic processes. Heat of a reaction at constant volume and at constant pressure, relation between  $\Delta H$  and  $\Delta V$ . 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's function (A) as thermodynamic quantities. Concept of maximum work and network  $\Delta G$  as Criteria for spontaneity. Derivation of equation  $\Delta G = \Delta H - T\Delta S$ . 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  $\alpha$ -hydrogens and tautomerism in carbonyl compounds, nitro hydrocarbons, ethyl acetoacetate, diethyl malonate. Terminal alkynes. Stability of carbanions Reactions : Aldol reaction, Perkin reaction, Benzoin condensation, haloform reaction, conversion of smaller alkynes to higher alkynes.

**Additional Inputs:** Acidic nature of  $\alpha$ -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<sub>2</sub>O 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).
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    1. Textbook of Inorganic Chemistry by R Gopalan(Universities Press(2012)
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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; 4<sup>th</sup> 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; 29<sup>th</sup> 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  $\beta$ -naphthyl methyl ether.
- vii. Condensation: Preparation of benzilidene aniline from Benzaldehyde and aniline.
- viii. Diazotisation: Azocoupling of  $\beta$ -Naphthol.

### 2. Microwave assisted synthesis of Aspirin – 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

## **B.Sc. II yr CHEMISTRY SEMESTER IV Paper-IV**

**COURSE CODE: CHE401**

**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 planar 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<sup>-</sup>). Toxic metal ions As, Hg & Pb Oxygen transport and storage – structure of hemoglobin, binding and transport of oxygen. Fixation of CO<sub>2</sub> 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<sup>+</sup> (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, electrophilic 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) (1 hr/week)**

**15h**

#### **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 H<sub>2</sub>O<sub>2</sub> 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- Grothaus 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<sub>2</sub>–Cl<sub>2</sub> and H<sub>2</sub>–Br<sub>2</sub> 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) (1 hr/week)**

**15h**

#### **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 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)
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7. Textbook of Inorganic Chemistry by R Gopalan, Universities Press,(2012)

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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)
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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



## 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

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III B.Sc Chemistry  
 45h (3h/w)

V Semester

Paper- V

**(Revised Syllabus With effect From June 2014-2015)**

Chapters	Unit –I Inorganic chemistry	15h
I	Coordination chemistry	10hrs
II	Spectral and magnetic properties of metal complexes	5hrs
	<b>Unit –II : Organic chemistry</b>	<b>15hrs</b>
I	Nitrogen compounds	9hrs
II	carbohydrates	6hrs
	<b>Unit –III : Physical chemistry</b>	<b>15hrs</b>
I	Chemical kinetics	9hrs
II	photochemistry	6hrs

**Unit – I (Inorganic Chemistry-III) 15 hrs (1 h/w)**

**1. Coordination Chemistry 10h**

IUPAC nomenclature, bonding theories – review of Werner's theory and Sidgwick's concept of coordination, Valence bond theory, geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal field theory, splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes – low spin and high spin complexes – factors affecting crystalfield splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds – structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

**2. Spectral and magnetic properties of metal complexes 5h**

Electronic absorption spectrum of  $[Ti(H_2O)_6]^{3+}$  ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility – Gouy method.

**UNIT – II (Organic Chemistry – III) 15 hrs (1h/w)**

**1. Nitrogen compounds 9 h**

Nitro hydrocarbons: Nomenclature and classification – nitro hydrocarbons – structure. Tautomerism of nitroalkanes leading to aci and keto form. Preparation of Nitroalkanes. Reactivity – halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction. Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> Amines

*[Handwritten signature]*

*W. Lalitha*

*L. S. S. Reddy*

*A. Anand*  
*M. S. S. Reddy*

and Quaternary ammonium compounds. Preparative methods -1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism).  
4. Reduction of Amides and Schmidt reaction. Physical properties and basic character - Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline - comparative basic strength of aniline, N-methylaniline and N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects: Use of amine salts as phase transfer catalysts. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg separation-e) Reaction with Nitrous acid of 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> (Aliphatic and aromatic amines). Electrophilic substitutions of Aromatic amines - Bromination and Nitration. oxidation of aryl and 3<sup>o</sup> Amines. Diazotization  
Cyanides and isocyanides: Nomenclature (aliphatic and aromatic) 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

### Carbohydrates

6 h

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 (Acetylation, reduction to n-hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acid). 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 (some negative aldehydes tests and mutarotation). Cyclic structure of glucose. Decomposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylation, hydrolysis and oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 - ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-nhexane). Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure and Haworth formula). Interconversion of Monosaccharides: Aldopentose to aldo hexose - eg: Arabinose to DGlucose, D-Mannose (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose eg: D-glucose to Darabinose by Ruff degradation. Aldohexose (+) (glucose) to ketohexose (-) (Fructose) and Ketohexose (fructose) to aldohexose (Glucose)

### Unit-III (physical chemistry-III) 15hrs (1 h / w)

#### 1. Chemical kinetics

9 h

Rate of reaction, factors influencing the rate of a reaction-concentration, temperature, pressure, solvent, light, catalyst. Experimental methods to determine the rate of reaction. Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Kinetics of complex reactions (first order only):

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opposing reactions, parallel reactions, consecutive reactions and chain reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy. Theories of reaction rates- collision theory-derivation of rate constant for bimolecular reaction. The transition state theory (elementary treatment).

## 2. Photochemistry

5 h

Difference between thermal and photochemical processes. Laws of photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield. Ferrioxalate actinometry. Photochemical hydrogen- chlorine, hydrogen-bromine reaction. Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing). Photosensitized reactions- energy transfer processes (simple example)



L. V. Sharma

A. V. Singh

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III B.Sc Chemistry  
 45h (3h/w)

V Semester

Paper- VI

(Revised Syllabus With effect From June 2014-2015)

Chapters	Unit –I Physico Chemical methods of analysis	15h
I	Séparation techniques	12hrs
II	Spectrophotometry	4hrs
	<b>Unit –II : Drugs</b>	<b>15hrs</b>
I	Drugs	15hrs
	<b>Unit –III :</b>	<b>15hrs</b>
I	Macromalucules	10hrs
II	Material science	5hrs

**Unit – I (Physico Chemical methods of analysis) 15 hrs (1 h / w)**

**1. Separation techniques**

**12 h**

1. Solvent extraction: Principle and process, Batch extraction, continuous extraction and counter current extraction. Application – Determination of Iron (III) 2. Chromatography: Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values. a. Paper Chromatography: Principles, Rf values, experimental procedures, choice of paper and solvent systems, developments of chromatogram – ascending, descending and radial. Two dimensional chromatography, applications. b. Thin layer Chromatography (TLC): Advantages. Principles, factor effecting Rf values. Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications. c. Column Chromatography: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications

**2. Spectrophotometry**

**4 h**

General features of absorption – spectroscopy, Beer-Lambert's law and its limitations, transmittance, Absorbance, and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of  
 1. Chromium in  $K_2Cr_2O_7$   
 2. Manganese in manganous sulphate  
 3: Iron (III) with thiocyanate.

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*K. Ramesh*



**Unit -II : Drugs 15 hrs (1 h / w)**

**1. Drugs**

**15 h**

1. Introduction: Drug, disease (definition), Historical evolution, Sources – Plant, Animal synthetic, Biotechnology and human gene therapy
2. Terminology: Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors – brief treatment) Metabolites and Antimetabolites.
3. Nomenclature: Chemical name, Generic name and trade names with examples
4. Classification: Classification based on structures and therapeutic activity with one example each.
5. Synthesis: Synthesis and therapeutic activity of the following drugs., L-Dopa, Chloroquin, Omeprazole, Albuterol and ciprofloxacin.
6. Drug Development: Pencillin, Separation and isolation, structures of different pencillins

**Unit-III: (Macromolecules, materials Science and catalysis) 15 hrs (1 h / w)**

**1. Macromolecules**

**10h**

Classification of polymers, chemistry of polymerization, chain polymerization, step polymerization, coordination polymerization – tacticity. Molecular weight of polymers number average and weight average molecular weight, degree of polymerization, determination of molecular weight of polymers by viscometry, Osmometry and light scattering methods. Kinetics of free radical polymerization, derivation of rate law. Preparation and industrial application of polyethylene, PVC, Teflon, polyacrylonitrile, terelene and Nylon66. Introduction to biodegradability.

**2. Materials science**

**4h**

Superconductivity, characteristics of superconductors, Meissner effect, types of superconductors and applications.

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III B.Sc Chemistry  
45h (3h/w)

VI Semester

Paper- VII

(Revised Syllabus With effect From June 2014-2015)

<b>Chapters</b>	<b>Unit –I Inorganic chemistry</b>	<b>15h</b>
I	Reactivity of metal complexes	4hrs
II	Stability of metal complexes	4hrs
III	Hard and soft acids bases	4hrs
IV	Bioinorganic chemistry	4hrs
	<b>Unit –II : Organic chemistry</b>	<b>15hrs</b>
I	Hetero cyclic compounds	5hrs
II	Amino acids and proteins	5hrs
III	Mass spectrometry	5hrs
	<b>Unit –III : Physical chemistry</b>	<b>15hrs</b>
I	Thermodynamics	15hrs

**Unit –I Inorganic chemistry 15hrs (1 h / w)**

**1. Reactivity of metal complexes: 4h**

Labile and inert complexes, ligand substitution reactions –  $S_N1$  and  $S_N2$ , substitution reactions of square planar complexes – Trans effect and applications of trans effect.

**2. Stability of metal complexes: 4h**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

**5. Hard and soft acids bases (HSAB): 4h**

Classification, Pearson's concept of hardness and softness, application of HSAB principles – Stability of compounds / complexes, predicting the feasibility of a reaction.

**6. Bioinorganic chemistry: 4h**

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and chloride (Cl<sup>-</sup>). Metalloporphyrins – hemoglobin, structure and function, Chlorophyll, structure and role in photosynthesis.



L. N. S. Reddy  
A. Shariq  
M. Ramesh



**Unit -II: Organic chemistry 15hrs (1 h / w)**

**1. Heterocyclic Compounds**

5 h

Introduction and definition: Simple 5 membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole. Importance of ring system – presence in important natural products like hemoglobin and chlorophyll. Numbering the ring systems per Greek letter and Numbers. Aromatic character – 6- electron system (four-electrons from two double bonds and a pair of non-bonded electrons from the hetero atom). Tendency to undergo substitution reactions. Resonance structures: Indicating electron surplus carbons and electron deficient heteroatom. Explanation of feebly acidic character of pyrrole, electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions. 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 from 1,4,- dicarbonyl compounds only, Paul-Knorr synthesis, structure of pyridine, Basicity – Aromaticity – Comparison with pyrrole – one method of preparation and properties – Reactivity towards Nucleophilic substitution reaction – chichibabin reaction.

**2. Amino acids and proteins**

5 h

Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids – definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. 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: L-configuration, irrespective of sign rotation, Zwitterion structure – salt like character - solubility, melting points, amphoteric 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 and proteins.

**3. Mass Spectrometry:**

5 h

Basic principles – Molecular ion / parent ion, fragment ions / daughter ions. Theory – formation of parent ions. Representation of mass spectrum. Identification of parent ion, (M+1), (M+2), base peaks (relative abundance 100%) Determination of molecular formula – Mass spectra of ethylbenzene, acetophenone, n-butyl amine and 1- propanal.

**Unit-III (physical chemistry-III) 15hrs (1 h / w)**

**1. Thermodynamics**

16 h

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule's law-Joule-Thomson coefficient. Calculation of w, q, dU and dH for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function.



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Temperature dependence of enthalpy of formation-Kirchoff's equation.  
Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy changes in cyclic, reversible, and irreversible processes and reversible phase change. Calculation of entropy changes with changes in V & T and P&T. Entropy of mixing inert perfect gases. Entropy changes in spontaneous and equilibrium processes.  
The Gibbs (G) and Hlmholtz (A) energies. A & G as criteria for thermodynamic equilibrium and spontaneity-advantage over entropy change. Gibbs equations and the Maxwell relations. Variation of G with P, V and T.



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Ashvini

Aravind



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III B.Sc Chemistry  
45h (3h/w)

VI Semester

Paper- VIII

**(Revised Syllabus With effect From June 2014-2015)**

Chapters	Unit –I Molecular spectroscopy	15h
I	Electronic spectroscopy	4hrs
II	Infrared spectroscopy	4hrs
III	Raman spectroscopy	2hrs
IV	Proton magnetic resonance spectroscopy	4hrs
V	Spectral interpretation	1hrs
	<b>Unit –II : Drugs</b>	<b>15hrs</b>
I	Drugs	2hrs
II	Formulations	5hrs
III	Pesticides	5hrs
IV	Green chemistry	5hrs
	<b>Unit –III :</b>	<b>15hrs</b>
I	Nanomaterials	3hrs
II	catalysis	12hrs


**Unit –I Molecular spectroscopy 15 hrs (1 h / w)**

**(i) Electronic spectroscopy:**

Interaction of electromagnetic radiation with molecules and types of molecular spectra. Potential energy curves for bonding and antibonding molecular orbitals. Energy levels of molecules ( $\sigma, \delta, n$ ). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore.

**(ii) 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.

  
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polyatomic molecules. Characteristic absorption bands of various functional groups.  
Finger print nature of infrared spectrum.

**(iii) Raman spectroscopy**

Concept of polarizability, selection rules, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

**(iv) Proton magnetic resonance spectroscopy (<sup>1</sup>H-NMR)**

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals – spin-spin coupling, coupling constants. Applications of NMR with suitable examples – ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

**(v) Spectral interpretation**

Interpretation of IR, UV-Visible, <sup>1</sup>H-NMR and mass spectral data of the following compounds 1. Phenyl acetylene 2. Acetophenone 3. Cinnamic Acid 4. para-nitro aniline

**Unit –II : Drugs 15 hrs (1 h / w)**

**1. Drugs**

1. HIV-AIDS: Immunity – CD-4 cells, CD-8 cells Retrovirus, replication in human body. Investigation available, prevention of AIDS. Drugs available – examples with structures: PIS: Indinavir (Crixivan), Nelfinavir (Viracept), NNRTIS: Efavirenz (Susrtiva), Nevirapine (Viramune) NRTIs: Abacavir (Ziagen), Lamivudine (EpiVir, 3TC) Zidovudine (Retravir, AZT, ZDV)

2. Monographs of drugs: Eg Paracetamol, Sulpha methoxazole (Tablets).

**2. Formulations**

**3 h**

1. Need of conversion of drugs into medicine. Additives and their role (brief account only)  
2. Different types of formulations

**3. Pesticides**

**5 h**

1. Introduction to pesticides – types – Insecticides, Fungicides, Herbicides, Weedicides, Rodenticides plant growth regulators, Pheromones and Hormones. Brief discussion with examples, Structure and uses.

2. Synthesis and present status of the following. DDT, BHC, Malathion, Parathion, Endrin, Baygon, 2,4-D and Endo-sulphon

**4. Green Chemistry**

**5h**

**Introduction:** Definition of green Chemistry, need of green chemistry, basic principles of green chemistry

**Green synthesis:** Evaluation of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic), Pericyclic reactions (no by-product).

Selection of solvent:

i) Aqueous phase reactions ii) Reactions in ionic liquids iii) Solid supported synthesis  
iv) Solvent free reactions (solid phase reactions)

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ii) Green catalysts: i) Phase transfer catalysts (PTC) ii) Biocatalysts  
Microwave and Ultrasound assisted green synthesis:

1. Aldol condensation
2. Cannizzaro reaction
3. Diels-Alder reactions
4. Strecker synthesis
5. Willaimson synthesis
6. Dieckmann condensation

**Unit -III :** 15-hrs (1 h / w)

**1. Nanomaterials**

3h

Nanomaterials- synthetic techniques, bottom-up-sol-gel method, top-down- electro deposition method, Properties and applications of nano-materials. Composites-definition, general-characteristics, particle reinforce and fiber reinforce composites and their applications.

**2. Catalysis**

12h

Homogeneous and heterogeneous catalysis, comparison with examples. Kinetics of specific acid catalyzed reactions, inversion of cane sugar. Kinetics of specific base catalyzed reactions, base catalyzed conversion of acetone to diacetone alcohol. Acid and base catalyzed reactions- hydrolysis of esters, mutarotation of glucose. Catalytic activity at surfaces. Mechanisms of heterogeneous catalysis. Langmuir-Hinshelwood mechanism. Enzyme catalysis: Classification, characteristics of enzyme catalysis. Kinetics of enzyme catalyzed reactions-Michaelis Menton law, significance of Michaelis constant ( $K_m$ ) and maximum velocity ( $V_{max}$ ). Factors affecting enzyme catalysis- effect of temperature, pH, concentration and inhibitor. Catalytic efficiency. Mechanism of oxidation of ethanol by alcohol dehydrogenase.

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polyatomic molecules. Characteristic absorption bands of various functional groups.  
Finger print nature of infrared spectrum.

**(iii) Raman spectroscopy**

Concept of polarizability, selection rules, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

**(iv) Proton magnetic resonance spectroscopy (<sup>1</sup>H-NMR)**

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals – spin-spin coupling, coupling constants. Applications of NMR with suitable examples – ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

**(v) Spectral interpretation**

Interpretation of IR, UV-Visible, <sup>1</sup>H-NMR and mass spectral data of the following compounds 1. Phenyl acetylene 2. Acetophenone 3. Cinnamic Acid 4. para-nitro aniline

**Unit –II : Drugs**      15 hrs (1 h / w)

**1. Drugs**

1. HIV-AIDS: Immunity – CD-4 cells, CD-8 cells Retrovirus, replication in human body. Investigation available, prevention of AIDS. Drugs available – examples with structures: PIS: Indinavir (Crixivan), Nelfinavir (Viracept), NNRTIS: Efavirenz (Susrtiva), Nevirapine (Viramune) NRTIs: Abacavir (Ziagen), Lamivudine (EpiVir, 3TC) Zidovudine (Retravir, AZT, ZDV)
2. Monographs of drugs: Eg Paracetamol, Sulpha methoxazole (Tablets)

**2. Formulations**

3 h

1. Need of conversion of drugs into medicine. Additives and their role (brief account only)
2. Different types of formulations

**3. Pesticides**

5 h

1. Introduction to pesticides – types – Insecticides, Fungicides, Herbicides, Weedicides, Rodenticides plant growth regulators, Pheromones and Hormones. Brief discussion with examples, Structure and uses.
2. Synthesis and present status of the following. DDT, BHC, Malathion, Parathion, Endrin, Baygon, 2,4-D and Endo-sulphon

**4. Green Chemistry**

5h

**Introduction:** Definition of green Chemistry, need of green chemistry, basic principles of green chemistry

**Green synthesis:** Evaluation of the type of the reaction i) Rearrangements (100% atom economic), ii) Addition reaction (100% atom economic), Pericyclic reactions (no by-product). Selection of solvent:

- i) Aqueous phase reactions ii) Reactions in ionic liquids iii) Solid supported synthesis
- iv) Solvent free reactions (solid phase reactions)

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ii) Green catalysts: i) Phase transfer catalysts (PTC) ii) Biocatalysts  
Microwave and Ultrasound assisted green synthesis:

1. Aldol condensation
2. Cannizzaro reaction
3. Diels-Alder reactions
4. Strecker synthesis
5. Willaimson synthesis
6. Dieckmann condensation

**Unit -III :** 15-hrs (1 h / w)

**1. Nanomaterials**

3h

Nanomaterials- synthetic techniques, bottom-up-sol-gel method, top-down- electro deposition method. Properties and applications of nano-materials. Composites-definition, general characteristics, particle reinforce and fiber reinforce composites and their applications.

**2. Catalysis**

12h

Homogeneous and heterogeneous catalysis, comparison with examples. Kinetics of specific acid catalyzed reactions, inversion of cane sugar. Kinetics of specific base catalyzed reactions, base catalyzed conversion of acetone to diacetone alcohol. Acid and base catalyzed reactions- hydrolysis of esters, mutarotation of glucose. Catalytic activity at surfaces. Mechanisms of heterogeneous catalysis. Langmuir-Hinshelwood mechanism. Enzyme catalysis: Classification, characteristics of enzyme catalysis. Kinetics of enzyme catalyzed reactions-Michaelis Menton law, significance of Michaelis constant ( $K_m$ ) and maximum velocity ( $V_{max}$ ). Factors affecting enzyme catalysis- effect of temperature, pH, concentration and inhibitor. Catalytic efficiency. Mechanism of oxidation of ethanol by alcohol dehydrogenase.

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## LABORATORY COURSE - III

Practical Paper - III (Organic Chemistry) 90 hrs (3 h / w)

### 1. Synthesis of Organic Compounds

- i. Aromatic electrophilic substitution Nitration: Preparation of nitro benzene and p-nitro acetanilide, Halogenation: Preparation of p-bromo acetanilide - preparation of 2,4,6-tribromo phenol.
  - ii. Diazotization and coupling: Preparation of phenyl azo  $\alpha$ -naphthol
  - iii. Oxidation: Preparation of benzoic acid from benzoyl chloride
  - iv. Reduction: Preparation of m-nitro aniline from m-dinitro benzene
  - v. Esterification: Preparation of methyl p-nitro benzoate from p-nitro benzoic acid.
  - vi. Methylation: Preparation of  $\alpha$ -naphthyl methyl ether
- Condensation: Preparation of benzilidene aniline and Benzoyl aniline.

### 2. Thin layer Chromatography & Column Chromatography

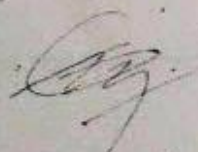
- i. Preparation of the TLC plates. Checking the purity of the compounds by TLC: Acetylation of salicylic acid, aniline, Benzoylation of Aniline and Phenol Determination of R<sub>f</sub> values and identification of organic compounds by TLC: preparation and separation of 2,4-dinitrophenyl hydrazones of acetone and 2-butanone using toluene and light petroleum(40:60)
- ii. Separation of ortho & para nitro aniline mixture by column chromatography

### 3. Organic Qualitative Analysis:

- i. Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives.
- ii. Separation of two component mixtures  
1) Aniline + Naphthalene 2) Benzoic acid + Benzophenone 3) p-Cresol + Chlorobenzene.

### 4. Demonstration experiments:

1. Steam distillation experiment: separation of ortho and para nitro phenols. 2) Microwave assisted Green synthesis, two examples: 1. Hydrolysis of Benzamide 2. Oxidation of Toluene



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**LABORATORY COURSE - IV**  
**Practical Paper IV (Physical Chemistry) 90hrs (3 h / w)**

**1. Chemical kinetics**

- i. Determination of specific reaction rate of the hydrolysis of methyl acetate catalyzed by hydrogen ion at room temperature.
- ii. Determination of rate of decomposition of hydrogen peroxide.
- iii. Determination of overall order of saponification of ethyl acetate

**2. Distribution law**

- i. Determination of distribution coefficient of iodine between water and carbon Tetrachloride.
- ii. Determination of molecular status and partition coefficient of benzoic acid in Toluene and water.

**3. Electrochemistry**

- i. Determination of concentration of HCl conductometrically using standard NaOH solution.
- ii. Determination of concentration of acetic acid conductometrically using standard NaOH solution.
- iii. Determination of dissociation constant ( $K_a$ ) of acetic acid by conductivity measurements.
- iv. Determination of solubility and solubility product of  $BaSO_4$ .
- v. Determination of redox potentials of  $Fe^{2+}/Fe^{3+}$  by potentiometric titration of ferrous ammonium sulphate vs. potassium dichromate.

**4. pH metry**

- i. Preparation phosphate buffer solutions
- ii. pH metric titration of weak acid, acetic acid with strong base NaOH and calculation of dissociation constant.

**5. Colorimetry**

- i. Verification of Beer-Lambert law for  $KMnO_4$ ,  $K_2Cr_2O_7$  and determination of concentration of the given solution.
- ii. Verification of Beer-Lambert law for  $CuSO_4$  and determination of concentration of the given solution.
- iii. Composition of complex of  $Cu^{2+}$  - EDTA disodium salt

**6. Adsorption**

- i. Surface tension and viscosity of liquids.
- ii. Adsorption of acetic acid on animal charcoal, verification of Freundlich isotherm.

**7. Project Work:**

Collection of spectral data of a minimum of six compounds belonging to different functional groups (other than those included in the syllabus) and submission of the report.



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Anshu

Waini



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III B.Sc Industrial Chemistry      V Semester      Paper V      45 hrs  
 (3h/w)

**(Revised syllabus with effect from June 2014-2015)**

Chapters	Unit-I		
1	Polymers	5	15hrs
2	Basics of polymerization	10	
	Unit II		
1	Polymers	7	15hrs
2	Elastomers Fibers	8	
	Unit III		
1	Industrial Organization		15hrs
	Concept of management Directing and Control location of Industry		

**Unit-I: Polymers**

**Basics of polymerization**

5 hrs

Introduction-Classification-Types of polymerization-Step polymerization-Condensation and Ring Opening polymerization, Chain-Free radical polymerization-Tactility, Molecular weight determination-Number average Molecular Wt-Wt average Molecular wt.

**Plastics:**

10 hrs

Introduction-Classification-Commodity-Thermo set and thermoplastics Prop and use Resin manufacturing process. Phenol- formaldehyde resins urea formaldehyde resins. Thermoplastics- Polyethylene, Polypropylene, Vinyl resins manufacture and resin compounding: Plasticizers, Color, fillers.



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**Unit-II**

**Elastomers:**

7 hrs

Natural and Synthetic rubber-Structure-Manufacture-Vulcanization of Rubber, Buna Rubber, Buna-S, Buna-N-Neoprene Rubber.

**Fibers**

8hrs

Introduction-Rayon or artificial silk- Copra ammonium process Acetate rayon. Viscose. Distinction between artificial and natural silk, polyamides, Nylon - 6, Nylon-66- Manufacture, Raw Materials of Nylon-6 and Nylon-66, Teflon, Polyesters, PET&PBT.

**UNIT-III**

**Industrial Organization**

15 hrs

Concept of scientific management, decision-making, planning, organizing, directing and control Location of Industry.

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III B.Sc Industrial Chemistry

VI Semester  
(3h/w)

Paper VII : 45 hrs

**(Revised syllabus with effect from June 2014-2015)**

Chapters	Units	
	<b>Unit I</b>	
1	<b>Chemical process Economics</b> Factors involved in project cost estimation	15hrs
	<b>Unit II</b>	
1	<b>Chemical process Economics</b> Some aspects of marketing pricing policy profitability criteria	15hrs
	<b>Unit III</b>	
1	<b>Industrial organization</b> Material management, inventory control, management of human resources	15hrs

**Unit-I**

**15 hrs**

**Chemical process Economics**

Factors involved in project cost Estimation.

Methods employed for the estimation of Capital investment.

Capital Formation, elements of cost accounting

Interest and Investment cost, Time value of money-equivalence

Depreciation, Taxes

**Unit-II**



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*Manjari*

**Chemical process Economics**

15 hrs

Some aspects of Marketing, Pricing policy

Profitability criteria, Economics of selecting alternatives

Variation of cost with capacity, Break-even point. Optimum Batch sizes, Production scheduling etc.

**Unit-III**

**Industrial organization**

15 hrs

Material management Inventory control

Management of human resources-Selection, incentives welfare and safety.

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III B.Sc Industrial Chemistry      V Semester      Paper VI      45 hrs  
 (3h/w)

**(Revised syllabus with effect from June 2014-2015)**

Chapters	Units		
	<b>Unit I</b>		
1	Pharmaceuticals Historical background and development of pharmaceutical	8	15hrs
2	Types of pharmaceutical excipients	7	
	<b>Unit II</b>		
1	Types of pharmaceutical excipients	6	15hrs
2	Surgical dressings	9	
	<b>Unit III</b>		
1	Chemical constitution of plants Products based on fermentation process	10	15hrs
2	Pharmaceutical quality control	5	

**Unit-I**

15 hrs

**Pharmaceuticals**

Historical Background and development of pharmaceuticals -Industry in India in brief-Pharmacopoeia-  
 Development and Introduction to B.P, USP, NF and other important Pharmacopoeias-Introduction to  
 various types of formulations and routes of Administration-Aseptic conditions, need for Sterilization.

Types of Pharmaceutical excipients-their chemistry process of manufacture, method of sterilization and  
 quality -Specifications- Glidants-Lubricants-Diluents, Preservatives.

**Unit-II**

**Types of Pharmaceutical excipients**

15 hrs

*Ray*      *L. N. Sankar*  
*Akhavut*

Anti oxidants emulsifying agents, coating agents, binders, coloring agents, Flavoring agents, Gelatin and other additives, Sorbitol, Mannitol, Viscosity Binders etc.

Surgical Dressings, Sutures, Ligatures, With respect to the process Equipments used for manufacture methods of Sterilization and Equality control Pharmaceutical packaging-Introduction, package, selection, packaging materials, ancillary materials, Packaging machinery, quality control of packaging materials.

**Unit-III**

15 hrs

**Chemical constitution of plants:** Carbohydrates, amino acids, Proteins, Fats, Waxes, Volatile oils, terpenoids, steroids, Saponins, flavonoids, alkaloids, glycosidases-Various isolation procedures for active ingredients with example for alkaloid eg. Vinca alkaloids, Reserpine one for steroids, Sapogenin.

**Pharmaceutical quality control:** Sterility testing, Pyrogenic testing, glass testing, bulk density of powers.

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*1st volume*



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III B.Sc Industrial Chemistry

VI Semester  
(3h/w)

Paper VIII

45 hrs

(Revised syllabus with effect from June 2014-2015)

Chapters	Units		
	<b>Unit I</b>		
	<b>Drugs</b>		
1	Classification of various types of drugs with examples	2	15hrs
2	Raw materials, process of manufacture	13	
	<b>Unit II</b>		
	<b>Drugs</b>		
1	Synthesis of various drugs	7	15hrs
2	vitamins	8	
	<b>Unit III</b>		
1	Evaluation of crude drug	6	15hrs
	Products based on fermentation process	9	

Unit-I

Drugs

15 hrs

Classification of various types of drugs with examples

Raw materials, process of manufacture, effluent handling of the following bulk drugs-Sulpha drugs, Sulphaguanidine, Sulphamethoxazole, Sulphanilamide, sulphathiozole, mechanism of action of sulpha drugs, antipyritics and analgesics-asprin, pencillin, novalgin, antimalarials, antibiotics, pencillin, synthesis and production of penicillin.

*Lnsterade*

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Kishan*

**Unit-II**

**Drugs**

15 hrs

Chloroquine synthesis, anti histamine, Chlorpheniramine maleate, antimicrobes, chlorphenicol, furazolidine-synthesis-anti inflammatory drugs-salicylic acid and its derivatives cardiovascular agents-methyldopa, barbiturates- pento barbital.

**Vitamins**-Classification and nomenclature, metabolic-Physiological or biological function of vitamins, vitamin A-isolation, diseases caused by its deficiency, physiological function, structure isolation, occurrence, structure, disease caused physiological function of the vitamins B, B<sub>2</sub>, B<sub>6</sub>.

**Unit-III**

15 hrs

**Evaluation of crude drugs:** Moisture content, extractive value, volatile oil content, foreign organic matter, qualitative microscopic exercises, starch, leaf content, (palisade ratio, stomatal no., index vein islet no. and vein termination no) crude fibre content, introduction to chromatographic method of identification of crude drugs.

**Products based on fermentation process:** Brief idea of microorganisms, their structure, growth and usefulness. Enzyme systems useful for transformations, microbial products, general principle of fermentation processes and product processing. Bio transformation processes-for prednisolone hydroxylation in steroids. Enzyme catalyzed transformations, manufacture of ephedrine.

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*A. P. L. V. S.*

*T. C. S. S.*



Paper -III

1. Preparation of dichlorobenzene from p-chloro aniline.
2. Preparation of p-Iodonitrobenzene from p-Nitro aniline.
3. Preparation of 1-phenyl,3-methyl,5-pyrazol.
4. Preparation of phenol formaldehyde resin.
5. Preparation of methyl orange.
6. Isolation of casein from milk.
7. Preparation of p-benzoquinone.
8. Preparation of soap.
9. Conductometric titrations
  - a) Strong acid Vs strong base
  - b) Weak acid Vs strong base.
  - c) Mixture of acids Vs strong base.
10. Potentiometric Titrations
  - a) Strong acid Vs strong base
  - b) Oxidation – reduction Titrations.
  - c) Precipitation Titrations.
11. Colourimetric Titrations.
  - a)  $\text{CuSO}_4$

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Lakshmi  
Abhinav  
Krishna

Revised practical syllabus of B.Sc.

Paper -IV

1. Estimation of Phenol.
2. Estimation of aniline.
3. Estimation of acetone.
4. Estimation of amount of ascorbic acid in the given solution.
5. Estimation of Mg in talcum powder (to analyse the % Mg present in the given sample).
6. To determine the acid value of Oleic acid.
7. Determination of the % w/w of lactic acid lactate together calculated as  $\text{H}_3\text{C}-\text{CHOH}-\text{COOH}$ .

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*A. H. L. V. S.*  
*1st year*

# Microbiology

**Semester – I**

**Course Title :- General Microbiology**

**COURSE CODE: MB101**

**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 microorganisms and biochemical pathways underlying their mechanism.

**CO7:** Can learn about different sterilization techniques and mechanism of growth and factors

**CO6:** In practicals students will learn microscope handling, calibration, staining and morphology of some micro organisms.

## **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, Laminar 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., Harley, J.P. and Klein Microbiology 2nd Edition, WCB McGrawHill, New York.
3. Madigan, M.T., Martinkl, I.M and Parker, J. Broch Biology Of Microorganism, 9<sup>th</sup> 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.
- GopalReddy.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**

**B.Sc. I Year: II Semester**

**COURSE CODE: MB201**

**Title: MICROBIAL DIVERSITY**

**4HPW - Credits-4**

**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 Archaeobacteria, Cyanobacteria etc.

CO3: Eukaryotic Microbial Diversity – Students will learn about diversity of eukaryotic microorganisms such as fungi, algae, protozoa 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.

### **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 Firmicutes, Actinobacteria, Bacteroidetes, Acidobacteria and Planctomycetes.

### **UNIT 3: EUKARYOTIC MICROBIAL DIVERSITY**

Eukaryotic microbial diversity. Structural, physiological and metabolic characteristics of Algae - Cyanophyta, Chlorophyta, Bacillariophyta, Phacophyta, Rhodophyta; Fungi -Phycomycetes, Basidiomycetes, Zygomycetes, Oomycetes, Ascomycetes, 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 & 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,

### **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
- Ideniification 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. (2001). Experiments in Microbiology, Plant pathology, Tissue culture and Mushroom Production Technology, 3rd Edition, New Age International (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. Blackwell Scientific Publications, USA.
- Pepler, I. 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



**Government Degree College for Women, Autonomous,  
Begumpet, Hyderabad.**  
Accredited with "B" Grade by NAAC  
Subject - Microbiology (Total hrs of Teaching-60 @ 4hrs/Week)  
Semester: III, Module III (Microbial Nutrition, Growth and Genetics) (2015-2016)

<b>UNIT-I – Nutrition and Growth</b>	<b>15 hrs</b>
Microbial nutrition - nutritional requirements and uptake of nutrients by cells.	
Nutritional groups of microorganisms - autotrophs, heterotrophs, mixotrophs, methylotrophs.	5 Hrs
Growth media - synthetic, nonsynthetic, selective, enrichment and differential media.	
Microbial growth - different phases of growth in batch cultures.	4 Hrs
Factors influencing microbial growth.	2 Hrs
Synchronous, continuous, biphasic growth.	2 Hrs
Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbidometry, biomass.	2 Hrs
<b>UNIT-II - Enzymes</b>	<b>15 hrs</b>
Enzymes - properties and classification, enzyme unit.	5 Hrs
Biocatalysis - induced fit, and lock and key model, coenzymes, cofactors, factors affecting catalytic activity of enzymes.	5 Hrs
Inhibition of enzyme activity - competitive, noncompetitive, uncompetitive and allosteric.	5 Hrs
<b>UNIT-III - Microbial Genetics I</b>	<b>15 hrs</b>
Fundamentals of genetics - Mendelian laws, alleles, crossing over, and linkage.	
DNA and RNA as genetic materials.	8 Hrs
Structure of DNA – Watson and Crick model.	2 Hrs
Extrachromosomal genetic elements – Plasmids and transposons.	2 Hrs
Replication of DNA – Semiconservative mechanism.	3 Hrs
<b>UNIT-IV - Microbial Genetics 2</b>	<b>15 hrs</b>
Outlines of DNA damage and repair mechanisms.	4 Hrs
Mutations – spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions.	4 Hrs
Various physical and chemical mutagens.	2 Hrs
Brief account on horizontal gene transfer among bacteria – transformation, transduction	

and conjugation.

5 Hrs

Government Degree College for Women, Autonomous,  
Begumpet, Hyderabad.

Accredited with "B" Grade by NAAC

Subject - Microbiology (Total hrs of Teaching-60 @ 4hrs/Week)

Semester: IV, Module IV (Microbial physiology and Genetic engineering) (2015-2016)

**UNIT-I – Microbial Metabolism 1**

15 hrs

Aerobic respiration - Glycolysis, HMP pathway, ED pathway, TCA cycle, electron transport, oxidative and substrate-level phosphorylation. Anaplerotic reactions.  $\beta$ -Oxidation of fatty acids.

10 Hrs

Glyoxylate cycle. Anaerobic respiration (nitrate, sulphate respiration).

5 Hrs

**UNIT-II - Microbial Metabolism 2**

15 hrs

Fermentation - Common microbial fermentations with special reference to alcohol and lactic acid fermentations.

7 Hrs

Photosynthetic apparatus in prokaryotes. Outlines of oxygenic and anoxygenic photosynthesis in bacteria.

8 Hrs

**UNIT-III - Microbial Gene Expression**

15 hrs

Concept of gene – Muton, recon and cistron. One gene-one enzyme, one gene-one polypeptide, one gene-one product hypotheses.

4 Hrs

Types of RNA and their functions.

2 Hrs

Outlines of RNA biosynthesis in prokaryotes.

2 Hrs

Genetic code. Structure of ribosomes and a brief account of protein synthesis.

4 Hrs

Operon concept. Regulation of gene expression in bacteria – lac operon.

3 Hrs

**UNIT-IV - Recombinant DNA Technology**

15 hrs

Basic principles of genetic engineering - restriction endonucleases, DNA polymerases and ligases,

6 Hrs

Outlines of gene cloning methods.

3 Hrs

Genomic and c DNA libraries.

3 Hrs

General account on application of genetic engineering in industry, agriculture and medicine.

3 Hrs

## **MICROBIAL PHYSIOLOGY AND GENETICS (Practicals) 90 Hrs**

1. Preparation of media for culturing autotrophic and heterotrophic microorganisms - Algal medium, mineral salts medium, nutrient agar medium, McConkey agar, and blood agar.
2. Enrichment culturing and isolation of phototrophs and chemoautotrophs.
3. Setting and observation of Winogradsky column.
4. Determination of viable count of bacteria.
5. Turbidometric measurement of bacterial growth.
6. Bacterial growth curve.
7. Factors affecting bacterial growth – pH, temperature, salts.
8. Colorimetric estimation DNA by diphenylamine method.
9. Colorimetric estimation of proteins by Biuret/Lowry method
10. Paper chromatographic separation of sugars and amino acids
11. Starch hydrolysis, catalase test and sugar fermentation test.
12. Verification of Beer's law.
13. Problems related to DNA and RNA characteristics, Transcription and Translation.



**B.SC. III YEAR SYLLABUS (2014-15)**  
**SUBJECT - MICROBIOLOGY (TOTAL HRS OF TEACHING-45@ 3hrs/week)**

**V SEMESTER, P-V**

**( Immunology )**

<b>UNIT-I – History of Immunology and Immune System</b>	<b>10 hrs</b>
Development of immunology.	2 Hrs
Types of immunity – innate and acquired; active and passive; humoral and cell-mediated immunity.	4 Hrs
Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes.	4 Hrs
<b>UNIT-II – Cells of Immune System</b>	<b>10 Hrs</b>
Cells of immune system.	3 Hrs
Identification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils.	4 Hrs
Antibodies – basic structure, types, properties and functions of immunoglobulins.	3 Hrs
<b>UNIT – III Principles of Immunology</b>	<b>15 Hrs</b>
Antigens – types, chemical nature, antigenic determinants, haptens.	2 Hrs
Factors affecting antigenicity.	2 Hrs
Components of complement and activation of complement.	3 Hrs
Types of antigen-antibody reactions – agglutination, blood groups, precipitation, neutralization, complement fixation.	5 Hrs
Labeled antibody based techniques – ELISA, RIA and Immunofluorescence.	3 Hrs
<b>UNIT - IV Applications of Immunology</b>	<b>10 Hrs</b>
Polyclonal and monoclonal antibodies – production and applications.	3 Hrs
Types of hypersensitivity – immediate and delayed.	4 Hrs
Autoimmunity and its significance.	3 Hrs

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 Chairman,  
 Board of Studies,  
 Dept. of Microbiology,  
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*J. Sridhar*  
 15/4/14

*K. Kusuma Deepa*  
 15/4/14

*Madhavi*  
 15/4/14

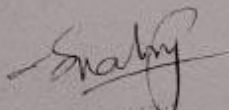


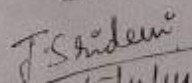
B.S.C. III YEAR SYLLABUS (2014-15)  
SUBJECT - MICROBIOLOGY (TOTAL HRS OF TEACHING-45@ 3hrs/week)

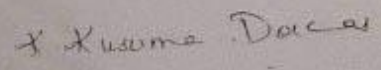
V SEMESTER, P-VI

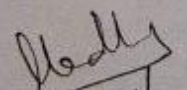
(Agricultural and Environmental Microbiology)

<b>UNIT - I Agricultural Microbiology</b>	<b>11 Hrs</b>
Physical and chemical characteristics of soil.	2 Hrs
Rhizosphere and phyllosphere.	1 Hr
Plant growth-promoting microorganisms -mycorrhizae, rhizobia, <i>Azospirillum</i> , <i>Azotobacter</i> , cyanobacteria, <i>Frankia</i> and phosphate-solubilizing microorganisms.	3 Hrs
Outlines of biological nitrogen fixation (symbiotic, non-symbiotic).	4 Hrs
Biofertilizers - <i>Rhizobium</i> .	1 Hr
<b>UNIT - II Plant Diseases and Biocontrol</b>	<b>11 Hrs</b>
Concept of disease in plants.	1 Hr
Symptoms of plant diseases caused by fungi, bacteria, and viruses.	3 Hrs
Plant diseases caused by fungi (groundnut rust), bacteria (angular leaf spot of cotton) and viruses (tomato leaf curl).	3 Hrs
Principles of plant disease control.	2 Hrs
Biological control of plant diseases. Biopesticides - <i>Bacillus thuringiensis</i> , Nuclear polyhedrosis virus (NPV), <i>Trichoderma</i> .	2 Hrs
<b>UNIT - III Environmental Microbiology a</b>	<b>11 Hrs</b>
Microorganisms of environment (soil, water and air).	2 Hrs
Role of microorganisms in nutrient cycling (carbon, nitrogen, sulphur).	4 Hrs
Microbial interactions - mutualism, commensalism, antagonism, competition, parasitism, predation.	5 Hrs
<b>UNIT - IV Environmental Microbiology b</b>	<b>12 Hrs</b>
Microbiology of potable and polluted waters. <i>E. coli</i> and <i>Streptococcus faecalis</i> as indicators of water pollution. Sanitation of potable water.	3 Hrs
Secondary pollution (primary, secondary and tertiary).	3 Hrs
Outline of biodegradation of environmental pollutants - pesticides.	2 Hrs
Solid waste disposal - sanitary land fills, composting.	2 Hrs
Microbiology of air and air sampling methods.	2 Hrs

  
 Chair  
 Board of Studies  
 Dept. of Microbiology  
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**B.S.C. III YEAR SYLLABUS (2014-15)**  
**SUBJECT - MICROBIOLOGY (TOTAL HRS OF TEACHING-45@ 3hrs/week)**

**VI SEMESTER, P-VII**  
**( Medical Microbiology )**

<b>UNIT - I History of Medical Microbiology &amp; Host defense mechanisms.</b>	<b>10 Hrs</b>
History of medical microbiology.	1 Hr
Normal flora of human body.	2 Hrs
Definition of infection, non-specific defense mechanisms, mechanical barriers, antagonism of indigenous flora.	3 Hrs
Anti-bacterial substances – lysozyme, complement, properdin, antiviral substances, phagocytosis.	4 Hrs
<b>UNIT - II Diagnostic Microbiology &amp; Host Pathogen Interactions</b>	<b>14 Hrs</b>
General principles of diagnostic microbiology.	1 Hr
Collection, transport and processing of clinical samples.	3 Hrs
General methods of laboratory diagnosis – cultural, biochemical, serological and molecular methods.	4 Hrs
Tests for antimicrobial susceptibility.	2 Hrs
Antiviral agents – interferon and base analogues.	2 Hrs
Host-pathogen interactions. Bacterial toxins, virulence and attenuation.	2 Hrs
<b>UNIT - III Chemotherapy and Vaccines</b>	<b>9 Hrs</b>
Elements of chemotherapy – therapeutic drugs. Drug resistance.	2 Hrs
Mode of action of penicillin and sulpha drugs, and their clinical use.	2 Hrs
Preventive control of diseases – active and passive immunization.	3 Hrs
Vaccines – natural and recombinant.	2 Hrs
<b>UNIT - IV Parasitology and Fungal Organisms and Diseases</b>	<b>15 Hrs</b>
General features of the following diseases – causal organisms, pathogenesis, epidemiology, diagnosis, prevention and control of:	
Air-borne diseases - Tuberculosis, Influenza	2 Hrs
Food and water borne diseases - Cholera, Typhoid, Hepatitis- A	
Polio-myelitis, Rabies	5 Hrs
Insect-borne diseases - Malaria, Dengue fever	3 Hrs
Contact diseases - Syphilis, Gonorrhoea	2 Hrs
Zoonotic diseases - Rabies	
Blood-borne diseases - Serum hepatitis, AIDS	2 Hrs
General account of nosocomial infections.	1 Hr

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**Chairman**  
**Board of Studies**  
**Dept. of Microbiology**  
**S. S. A. S. S.**

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**X. Kusuma Das**  
**15/4/14**  
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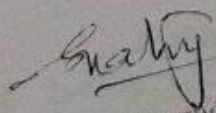


B.SC. III YEAR SYLLABUS (2014-15)  
SUBJECT - MICROBIOLOGY (TOTAL HRS OF TEACHING-45@ 3hrs/week)

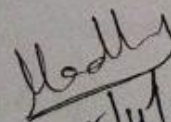
VI SEMESTER, P-VIII

(Food and Industrial Microbiology)

<b>UNIT - I Food Microbiology</b>	<b>12 Hrs</b>
Microorganisms of food spoilage and their sources.	2 Hrs
Spoilage of different food materials - fruits, vegetables, meat, fish.	3 Hrs
Canned foods.	
Food intoxication (botulism and staph poisoning), foodborne diseases (salmonellosis and shigellosis) and their detection.	4 Hrs
General account of food preservation.	3 Hrs
<b>UNIT-II Applied Food Microbiology</b>	<b>10 Hrs</b>
Microbiological production of fermented foods – bread, cheese, yogurt.	3 Hrs
Biochemical activities of microbes in milk.	2 Hrs
Microorganisms in food – SCP, edible mushrooms (white button, oyster and paddy straw).	3 Hrs
Concept of probiotics.	2 Hrs
<b>UNIT - III Industrial Microbiology</b>	<b>11 Hrs</b>
Microorganisms of industrial importance – yeasts, moulds, bacteria, actinomycetes.	2 Hrs
Screening and selection of industrially-important microorganisms.	3 Hrs
Outlines of strain improvement.	2 Hrs
Types of fermentation – aerobic, anaerobic, batch, continuous, submerged, surface solid state.	4 Hrs
<b>UNIT - IV Microbial Biotechnology</b>	<b>12 Hrs</b>
Design of a stirred tank reactor fermentor.	2 Hrs
Fermentation products.	2 Hrs
Industrial production of alcohols (ethyl alcohol), beverages (beer), enzymes (amylases), antibiotics (penicillin), amino acids (glutamic acid), organic acids (citric acid), vitamins (B12), biofuels (biogas - methane).	8 Hrs

  
 Chairman  
 Board of Studies  
 Dept. of Microbiology  
 G. G. H.D. - 2  
 S. Sridhar  
 15/4/14

X Kusuma Daces  
 15/4/14

  
 15/4/14

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

**DEPARTMENT OF MICROBIOLOGY**

B.SC.III YEAR (2014-15)

SYLLABUS/COURSE PATTERN AND SCHEME OF EXAMINATION.  
(Applicable for students of 2014-15, B.Sc. III Year)

Semester- V	Theory Paper-V	Immunology	Internal exams-10 M Final exam-40 M Total-50 M
	Theory Paper-VI	Agricultural and Environmental Microbiology	Internal exams-10 M Final exam-40 M Total -50 M
Semester- VI	Theory Paper-VII	Medical Microbiology	Internal exam-10M Final exam-40M Total-50M
	Theory Paper-VIII	Food and Industrial Microbiology	Internal exam-10 Final exam-40 Total-50
Practicals	Practical Paper- <del>IX</del> VI & VII	Immunology and Medical Microbiology	Total Marks -50
	Practical Paper- <del>X</del> VI & VIII	Applied Microbiology (Agricultural and Environmental Microbiology, Food and Industrial Microbiology)	Total Marks-50

NOTE: Practical exams will be conducted at the end of Semester-VIII

Signatures of B.O.S :

*[Signature]*  
Chairman  
Board of Studies  
Dept. of Microbiology  
B. Sc. - HYD - "

*J. Sridhar*  
15/4/14

*S. Kusuma Dases*

15/4/14

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15/4/14



# Biotechnology

## B.Sc. Biotechnology I YEAR

### SEMESTER- I DSC-Paper- I: CELL BIOLOGY AND GENETICS

Course Code:BT101

**COURSE OUTCOMES OF BIOTECHNOLOGY 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.

##### **Unit 1: Cell structure and Functions**

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

##### **Unit 2: Cell cycle**

1. Bacterial cell division
2. Eukaryotic cell cycle –phases
3. Mitosis - Stages -significance
4. Meiosis- Stages -significance
5. Senescence and necrosis
6. Apoptosis

##### **Unit 3: Principles and mechanism of inheritance**

1. Mendelian laws of inheritance- Monohybrid cross, Dihybrid Ratio, Trihybrid Ratio
2. Deviation from Mendel's laws- partial or incomplete dominance (eg: Flower Color in *Mirabilis jalapa*), Co-dominance (eg: Coat colour in cattle),
3. Gene interaction – Modified dihybrid ratios (12:3:1; 9:7; 15:1; 9:3:4, 9:7; 13:3),
4. Multiple allelism (eg: Coat color in Rabbits and ABO Blood groups, drosophila eye colour)
5. Penetrance and Expressivity (Polydactyly and Waardenburg syndrome, Pleiotropism – B.Sc. B.Sc. Biotechnology I YEAR
6. SEMESTER- I DSC-Paper- I: CELL BIOLOGY AND GENETICS
7. Course Code:BT101
8. Biotechnology I YEAR
9. SEMESTER- I DSC-Paper- I: CELL BIOLOGY AND GENETICS
10. Course Code:BT101
11. microcephaly and cleft lip
12. 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**

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
2. Non-Mendelian Inheritance – Maternal effect (Shell coiling in snail), variegation in leaves of *Mirabilis jalapa*
3. Cytoplasmic Male sterility in Maize
4. Chloroplast inheritance in Chlamydomonas,
5. Mitochondrial inheritance in human
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 Code: BT201**

#### **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 Code: BT301

## **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. Genome organization in prokaryotes and Eukaryotes
1. Genome organization in Mitochondria and Chloroplast genome
1. DNA replication- Semi conservative DNA replication-Messelson and Stahl experiment
1. Replication in Prokaryotic Genome and Nuclear Genome of Eukaryotes
1. Mutation-Spontaneous and Induced , Physical and chemical Mutagens\
  - 1. Gene expression in prokaryotes and Eukaryotes**
  1. Structure of prokaryotic and Eukaryotic gene ,Structure and functions of prokaryotic RNA polymerase
  2. Transcriptional machinery of eukaryotes - Structure and functions of eukaryotic RNA polymerase
  3. Genetic Code-Properties ,deciphering genetic code, wobble hypothesis
  4. Prokaryotic Transcription- initiation, elongation , proof reading and termination (rho dependent and independent),
  5. Eukaryotic Transcription- initiation, elongation and termination
  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 Selection of recombinant clones-colony hybridization and library screening

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

## **SEMESTER IV- Bioinformatics and Biostatistics**

### **Course Code: BT401**

#### **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 variables

#### **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 and 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 Variance (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

SYLLABUS FOR B.Sc III Year BIOTECHNOLOGY Course

Paper III

Semester V

Molecular Biology & Gene Regulation

2014-15

Unit-1: Gene

10 Hrs

- 1.1 Organisation of nuclear genome-genes and gene numbers-essential and non essential genes
- 1.2 Chemical composition of DNA- GC content, C-value & C-Value Paradox
- 1.3 Denaturation & Renaturation Of DNA- Tm Values & Cot curves
- 1.4 Kinetic Classes of DNA – Single copy Sequences & repeated sequences, Inverted, Tandem & palindromic repeats
- 1.5 Satellite DNA

Unit-2 : Genome Organisation

15Hrs

- 2.1 Mitochondrial genome organization (eg: Human)
- 2.2 Chloroplast genome organization in plants
- 2.3 Organisation of eukaryotic genes  
Exons, Introns, Promoters & Terminators
- 2.4 Gene Families & clusters  
Eg: Globin Gene, Histones & Ribosomal genes.

Unit-3: Gene Expressions & Gene Regulation

20Hrs

- 3.1 Transcription : Prokaryotic & Eukaryotic Transcription  
Post Transcriptional Modifications ( Capping, Polyadenylation, Splicing & Alternate splicing)
- 3.2 Translation: Genetic Code & its Features, Wobble Hypothesis, Synthesis of Polypeptides- Initiation, Elongation & Termination in prokaryotes & eukaryotes
- 3.3 Regulation of gene expression in prokaryotes and eukaryotes.  
Operon Concept in Bacteria- Lac Operon.

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M. J. Jay

M. J. Jay

P. J. Jay

M. J. Jay

Dr. PARVEEN JAHAN  
M.Sc., D.  
Chairperson Board of Studies Biotechnology  
Osmania University, Hyderabad-07.

SYLLABUS FOR B.Sc III Year BIOTECHNOLOGY Course

Paper III

Semester VI

Recombinant DNA Technology & Immunology  
2014-15

Unit-1 Recombinant DNA technology

10 Hrs

- 1.1 Enzymes Used in Gene Cloning : Restriction Endonucleases, Ligases, Phosphatases, Methylases, Kinases
- 1.2 Cloning Vehicles- Plasmids, Cosmids, Phage Vectors, Shuttle vectors
- 1.3 Baculovirus Vector System, Expression Vectors- Expression Cassettes
- 1.4 Construction of Genomic & cDNA libraries
- 1.5 Identification of Cloned Genes

Unit-2 Genetic Engineering

15 Hrs

- 2.1 Application of Genetic Engineering ( Humilin, Somatostatin, Vaccines, Golden Rice With Vitamin A )
- 2.2 Principles Involved in Blotting Techniques- SOUTHERN, NORTHERN & WESTERN
- 2.3 Principles & Applications of PCR Technology
- 2.4 DNA Fingerprinting Technique & its applications

Unit-3 Basics Of Immunology

20 Hrs

- 3.1 Introduction to Immune System- Organs & Cells of the Immune System
- 3.2 Antigens, Haptens- Physico-Chemical Characteristics
- 3.3 Structure of Different Immunoglobulins & their Functions – Primary & Secondary antibody responses
- 3.4 Antigen – Antibody Reactions
- 3.5 The Major Histocompatibility Gene Complex and its role in Organ Transplantation, Generation of Antibody Diversity.
- 3.6 Hypersensitivity- Coombs Classification, Types of Hypersensitivity.
- 3.7 Auto immune Diseases- mechanisms of Autoimmunity

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Osmania University, Hyderabad-07

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## Practical Syllabus for B.Sc III Year

### Paper III

### Semester V & VI

2014-15

#### PRACTICALS:

- 1 Isolation of DNA from plant/animal/bacterial cells.
- 2 Analysis of DNA by Agarose gel electrophoresis
- 3 Restriction digestion of DNA
- 4 GC content
- 5 Calculation of T<sub>m</sub> values
- 6 Preparation of competent cells in bacteria
- 7 Bacterial Transformation and selection of transformants under pressure( Antibiotic)
- 8 Radial Immuno Diffusion test
- 9 ELISA test
- 10 Hemagglutination ( Eg: ABO and Rh blood grouping)
- 11 Viability test of bacteria (Evan's blue test)
- 12 Coomb's test

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Dr. PARVEEN JAHAN  
M.Sc - D

Chairperson Board of Studies Biotechnology  
Osmania University Hyderabad-50.

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# SYLLABUS FOR B.Sc. III Year BIOTECHNOLOGY COURSE

## Paper IV

## Semester V

### ANIMAL BIOTECHNOLOGY AND PLANT BIOTECHNOLOGY 2014-15

#### Unit I: Animal Biotechnology

10 Hrs

- 1.1 Introduction to Animal Biotechnology
- 1.2 Principles of animal cell culture-Culture vessels
- 1.3 Cell culture media preparation, sterilization, types of cell culture
- 1.4 Establishment and Preservation of cell lines, Explants and cell disaggregation
- 1.5 Culture of cells and tissues (Stem cells and their applications)
- 1.6 InVitro fertilization and Embryo transfer technology

#### Unit II: Plant Biotechnology

15 Hrs

- 2.1 Composition of media (Murashige and Skoog's/Gamborg's)  
Preparation of media and methods of sterilizations
- 2.2 Role of plant growth regulators in differentiation
- 2.3 Induction of callus, meristem culture and production of virus free plants-Clonal propagation of plants on commercial scale (Somatic embryogenesis and Organogenesis)
- 2.4 Mass cultivation of cell cultures and process engineering- batch and continuous culture, Bioreactors, production of commercially useful compounds by plant cell culture

#### Unit III: Gene therapy and Gene transfer technologies in Animal and Plant Biotechnology

20 Hrs

- 3.1 Animal Biotechnology: Methods of gene transfer-Microinjection and Viral mediated Gene transfer techniques-Production of transgenic animals and Molecular pharming
- 3.2 Principles of Ex Vivo and In Vivo gene therapy in animals
- 3.3 Plant Biotechnology: Methods of gene transfer techniques (*Agrobacterium*, Micro projectile bombardment)
- 3.4 Applications of recombinant DNA technology in agriculture
- 3.5 Production of therapeutic proteins from transgenic plants

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Dr. PARVEEN JAHAN  
M.Sc. in D

Chairperson Board of Studies Biotechnology  
2014-15

SYLLABUS FOR B.Sc. III Year BIOTECHNOLOGY COURSE

Paper IV

Semester VI

INDUSTRIAL BIOTECHNOLOGY AND ENVIRONMENTAL BIOTECHNOLOGY  
2014-15

Unit I: Industrial Biotechnology

10 Hrs

- 1.1 Introduction to Industrial Biotechnology
- 1.2 Primary and Secondary metabolic products of microorganisms
- 1.3 Screening, isolation and preservation of industrial microorganisms
- 1.4 Principles of Fermentation technology, commercial production of fuels and chemicals by microbial fermentation
- 1.5 Fermentative production of microbial enzymes (amylase and proteases), antibiotics, foods and dairy products
- 1.6 Good Manufacturing Practices, Biosafety issues, Bioethics, Intellectual property rights and patent issues

Unit II: Environmental Biotechnology

15 Hrs

- 2.1 Introduction to Environmental Biotechnology
- 2.2 Renewable and non-renewable energy resources
- 2.3 Conventional energy sources and their impact on environment  
Non-conventional energy sources and their impact on environment (Bio-gas, Bio-ethanol)
- 2.4 Microbial analysis of Milk, Food and Water.

Unit III: Applications of Industrial and Environmental Biotechnology

20 Hrs

- 3.1 Industrial Biotechnology: Animal cells as bioreactors- characteristics of bioreactors, expression and overproduction of targeted proteins, human growth hormones
- 3.2 Production of  $\alpha$  and  $\beta$  interferons, monoclonal antibodies
- 3.3 Environmental Biotechnology: Microbiological treatment of municipal and industrial effluents, Microbial degradation of pesticides and toxic chemicals
- 3.4 Biopesticides and Biofertilizers (Nitrogen fixing, phosphate solubilizing microorganisms)  
Microbial ore leaching and Bioremediation

*Handwritten signatures and dates:*  
19/4/14  
H. D. S. S.

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*Handwritten signature:* Dr. Parveen Jahan  
Dr. PARVEEN JAHAN  
M.Sc. Ph.D.  
Chairperson Board of Studies, Biotechnology  
Osmania Univ. Hyderabad-57



## Practical Syllabus for B.Sc. III Year

### Paper IV Semester V & VI

2014-15

#### PRACTICALS:

- 1 Preparation of media and initiation of callus from any one selected plant species
- 2 Micro propagation of plants
- 3 Preparation of synthetic seeds
- 4 Production of wine using common yeast
- 5 Production of biogas using cow-cattle dung
- 6 Isolation of microbes from soil or industrial effluents
- 7 Preparation of media and culture of animal cells
- 8 Cell disaggregation and cell counting
- 9 Cytotoxicity of cells using the dye MTT method
- 10 Estimation of BOD in water sample
- 11 Estimation of alcohol by calorimetry
- 12 Production of biofertilizers (Azolla)
- 13 Growth curve of bacteria, measurement of growth in liquid culture
- 14 Qualitative testing of milk by MBRT

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Dr. PARVEEN  
Chairperson Board of Studies  
Osmania University Hyderabad

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# Telugu

## పాఠ్యప్రణాళిక :: 2015-16 :: మొదటి సంవత్సరం

### Semester 1

- I. 1. శకుంతలోపాఖ్యానం
2. సుభాషితములు
- II. 3. కాసులు
4. 'ప్ర'పంచ పదులు
- III. 5. మామిడిపండు
- IV. 6. వ్యాకరణం  
సంధులు, సమాసాలు

**సంధులు:** సవర్ణదీర్ఘసంధి

గుణ సంధి  
వృద్ధి సంధి  
యణాదేశ సంధి  
త్రికసంధి  
గసడదవాదేశ సంధి

**సమాసాలు:** షష్ఠీ తత్పురుష

రూపకం  
సంభావనా పూర్వపద కర్మధారయం  
బహువ్రీహి  
ద్వంద్వం  
ద్విగు



## **Semester 2**

- I. 1. గొడగూచి కథ
- 2. హనుమత్ సందేశము
  
- II. 3. జయభేరి
- 4. అంతర్నాదము
  
- III. 5. ఎంకన్న
  
- IV. 6. రుద్రమదేవి

# పాఠ్యప్రణాళిక :: 2015-16 :: రెండవ సంవత్సరం

## Semester 3

- |      |    |                           |                |
|------|----|---------------------------|----------------|
| I.   | 1. | ధర్మజుని వాక్చతుర్యం      |                |
|      | 2. | గుణనిధి కథ                |                |
| II.  | 3. | దేవరకొండ దుర్గం           |                |
|      | 4. | గురుదక్షిణ                |                |
| III. | 5. | సి.పి. బ్రౌన్ సాహిత్య సేవ |                |
| IV.  | 6. | చందస్సు - అలంకారాలు       |                |
|      |    | ఉత్పలమాల                  | ఉపమ            |
|      |    | చంపకమాల                   | శ్లేష          |
|      |    | ఆటవెలది                   | అర్ధాంతరన్యాసం |
|      |    | తేటగీతి                   | వ్యాజస్తుతి    |

## **Semester 4**

- I. 1. నారదుని గాన మాత్సర్యం  
2. నారసింహ శతకం
- II. 3. నరుడ నేను నరుడ నేను  
4. ఆర్తగీతం
- III. 5. కొండమల్లెలు  
6. చలిచీమలు

# English

GOVERNMENT DEGREE COLLEGE FOR WOMEN  
Begumpet, Hyderabad – 500016.  
(An Autonomous College of Osmania University)  
Re-Accredited by NAAC with 'B' Grade

Department of English  
B.A., B.Sc., B.Com Semester I  
General English Syllabus

## PROSE

### Title of the Lesson

1. Conjuror's Revenge
2. The Best Investment I Ever Made
3. Is Progress Real?

### Name of the Author

Stephen Leacock  
A.J.Cronin  
Will and Ariel Durant

## POETRY

1. Ode to Autumn
2. Dover Beach
3. The Unknown Citizen

John Keats  
Matthew Arnold  
W.H.Auden

## GRAMMAR AND VOCABULARY

1. Reading Comprehension
2. Verb Forms
3. Right Words (Synonyms, Antonyms, Homonyms and One-Word Substitutes)
4. Idioms and Phrases
5. Detection of Errors

## FURTHER READING:

### SHORT STORIES

1. How Far is the River
2. The Last Clock

Ruskin Bond  
James Thurber



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Department of English  
B.A., B.Sc., B.Com Semester II  
General English Syllabus

**PROSE**

Title of the Lesson

1. I Have a Dream
2. Prospects of Democracy
3. Letter to a Teacher

Name of the Author

Martin Luther King  
Dr.B.R.Ambedkar  
The School of Barbiana, (Trans.)  
Nora Rossi and Tom

**POETRY**

1. From Homecoming
2. Telephone Conversation
3. Song 36(from Gitanjali)

R.Parthasarathy  
Wole Soyinka  
Rabindranath Tagore

**Grammar Exercises from the Prescribed Text:**

1. Vocabulary & Usage
2. Paragraph Writing
3. Mind Mapping
4. Note Making
5. Dialogue Writing

**FURTHER READING:**

**ONE-ACT PLAYS**

1. Sacrifice (the last Act only)
2. The Boy Comes Home

Rabindranath Tagore  
A.A.Milne

**Prescribed Textbook: English @ Work: Selections from Poetry and Prose**  
(published by Macmillan)

**Prescribed Textbook: Building Competency: A Course in Reading and Writing**  
English (published by Maruthi Publications)

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Department of English  
 B.A., B.Sc., B.Com  
 General English  
 Semester – III Syllabus (credits – 3)

**Contents:**

- Unit-1 Satya Nadella
- Unit-2 Larry Page and Sergey Brin
- Unit-3 Martin Luther King
- Unit-4 A.P.J. Abdul Kalam
- Unit-5 Soft Skills
- Unit-6 Civic Sense

**GRAMMAR, VOCABULARY AND WRITINGS**

<u>GRAMMAR</u>	<u>VOCABULARY</u>	<u>WRITINGS</u>
1.Noun phrases	1.Plurals	1.Reports
2.Adjective phrases	2.Greek & Latin Root Words	2.Feasibility Reports
3.Adverbial phrases	3.Loan Words	3.Progress Reports
4.Noun clauses	4.Abbreviations	4.Book Reviews
5.Adjective clauses	5.Collocations	5.Film Reviews
6.Adverbial clauses	6.Oxymorons	6.Advertisements
		7.Articles

Prescribed Textbook: **Advanced Skills in English: A Course Book for Advanced Language Learning** (published by Orient Black Swan 2014)

## Semester 4

### Contents:

- Unit-1 The Hazards of Food Colouring
- Unit-2 Alternative Careers: The Making of Short Films
- Unit-3 The Open Window
- Unit-4 Uncle Podger Hangs a Picture
- Unit-5 Father William
- Unit-6 The Table and the Chair

### GRAMMAR, VOCABULARY AND WRITINGS

<u>GRAMMAR</u>	<u>VOCABULARY</u>	<u>WRITINGS</u>
1.Types of Sentences-I	1. Words related to Personality	1.Letters to the Editors
2.Types of Sentences-II	2.Words related to Filmmaking	2.Blogs
3.Degrees of Comparison	3.Words related to Farming	3.Autobiographies
4.Genitive & Possessive Adjectives	4.Words related to Jobs & Work	4.Creative Non-fiction
5.Phrasal Verbs	5.Words related to the Environment	5.Scientific Papers
6.Direct and Indirect Speech	6.Interesting & Uncommon Words	6.Short Stories

**Prescribed Textbook: Advanced Skills in English: A Course Book for Advanced Language Learning**  
(published by Orient Black Swan)

# Hindi

Govt. Degree college for women Begumpet - Hyd.

Dept - of Hindi

I Language 2015-2016

Syllabus for B.A, B.Com, B.Sc II semester (I year)

I Four lessons from Gadya Sandesh

1. Prithviraj Ki Aankhen - Dr. Ramkumar Varma
2. Binda - Mahadevi Varma
3. Bharat ek hai - Dr. Ramdhari Singh Rinker
4. HIV/AIDS - Dr. Prakash Bhetal Bunde  
Dr. Purnan Ganga Khadekar

II Four lessons from Katha Lok

1. Mai Han Gayi - Mannu Bhanderi
2. Bhagavashesh - Subhadra Kumari Chauhan
3. Panna ka kutta - Mohan Rakesh
4. Aur vah padh Gayi - Dr. Kusum Vigori

III Letter writing

IV Official Terminology & padham

V Sandhi niched

internal portion - Grammar

1. Correction of the sentences
2. Forming sentences
3. Karak
4. Vachya Badaliye



GOVT. DEGREE COLLEGE FOR WOMEN BEGUMPET (AUTONOMOUS)  
DEPARTMENT OF HINDI

II LANGUAGE

SYLLABUS FOR B.A, B.COM, B.SC – II SEMESTER (1 YEAR)

- A. 4 LESSONS FROM GADYA SANDESH
- |                           |                                                        |
|---------------------------|--------------------------------------------------------|
| 1. PRITHVIRAAJ KI AANKHEN | - DR. RAMKUMAR VERMA                                   |
| 2. BINDA                  | - MAHADEVI VERMA                                       |
| 3. BHARAT EK HAI          | - RAMDHAARI SINGH DINKAR                               |
| 4. H.I.V AIDS             | - DR. PRAKASH BHATAL BANDE<br>DR. RAMAN GANGA KHADEKAR |

- B. 4 LESSONS FROM KATHA LOK
- |                      |                           |
|----------------------|---------------------------|
| 1. MAI HAR GAYI      | - MANNU BHANDARI          |
| 2. BHAGNAVASHESH     | - SUBHADRA KUMARI CHOUHAN |
| 3. FARMATMA KA KUTTA | - MOHAN RAKESH            |
| 4. AUR VAH PADH GAYI | - DR. KUSUM VIYOGI        |

C. GRAMMER:

1. VILOM SHABD
2. CORRECTION OF SENTENCES
3. FORMING SENTENCES
4. SANDHI VICHCHEDH

D. LETTER WRITING : APPLICATION, COMPLAINTS

INTERNAL PORTION: – OFFICIAL TERMINOLOGY.

GOVT DEGREE COLLEGE OF WOMEN, BEGUMPET (AUTONOMOUS)  
DEPARTMENT OF HINDI

II LANGUAGE

SYLLABUS FOR B.A., B.COM, B.SC – II YEAR (AUTONOMOUS) CBCS

Semester – III  
2015 - 2016

Instructions	- 4Hrs/Week
Duration of Semester Examination	- 2 1/2 Hrs
Duration of Internal Examination	- 1 Hr
Semester Examination	- 75 Marks
Internal Examination	- 25 Marks
CREDITS -3	
POETRY : TEXT BOOK	

KAVYA DEEP

EDITED BY SRI RADHA KRISHNA MOORTHY  
MARUTHI PUBLICATION

पाठ्यक्रम

UNIT - I

1. कबीरदास - साखी (एक से दस दोहे)
2. सूरदास - विनय - एक पद  
बाल वर्णन - प्रथम पद
3. तुलसीदास दोहे - एक से दस (सब)
4. मातृभाषा के प्रति - भारतेन्दु हरिश्चंद्र
5. मातृभूमि - मैथिलिशरण गुप्त
6. भारतमाता - सुमित्रानन्दन पन्त
7. तोड़ती पत्र - सूर्यकांत त्रिपाठी निराला
8. मैं नीर भरी दुख की बरली - महादेवी वर्मा

UNIT - II

हिंदी साहित्य का इतिहास

1. आदिकाल - चंद बरदाई, विद्यापति
2. भक्ति काल - कबीर, जायसी, सूर, तुलसी  
(केवल प्रवृत्तियाँ)

GOVT DEGREE COLLEGE OF WOMEN, BEGUMPET (AUTONOMOUS)  
DEPARTMENT OF HINDI

II LANGUAGE

SYLLABUS FOR B.A., B.COM, B.SC – II YEAR (AUTONOMOUS) CBCS

Semester – IV

2015 - 2016

Instructions	- 4Hrs/Week
Duration of Semester Examination	- 2 1/2 Hrs
Duration of Internal Examination	- 1 Hr
Semester Examination	- 75 Marks
Internal Examination	- 25 Marks
CREDITS - 3	
POETRY : TEXT BOOK	

KAVYA DEEP

EDITED BY SRI RADHA KRISHNA MOORTHY  
MARUTHI PUBLICATION

पाठ्यक्रम

UNIT - I

1. मीराबाई - पद (1,2)
2. रहीम - दोहे (1 से दस)
3. बिहारी - दोहे (1 से दस)
4. परिचय - रामधारी सिंह दिनकर
5. यह दीप अकेला - अज्ञेय
6. ओ दीपक! बुझने के पहले - पी. आदेश्वर राव
7. बरसा! बूत हो चुका - ओमप्रकाश वाल्मीकि
8. मादा भूण - रजनी तिलक

UNIT - II

हिंदी साहित्य का इतिहास

1. रीतिकाल
2. आधुनिक काल - भारतेन्दु युग  
- द्विवेदी युग  
- छायावाद  
- प्रगतिवाद  
- प्रयोगवाद  
- नई कविता

(केवल प्रवृत्तियाँ)

SSVargade  
*[Handwritten Signature]*





## CONJUGATIONS:-

Present, Imperfect, 2nd future, Imperitive and Potential moods of the following roots:-

- |           |              |           |            |             |
|-----------|--------------|-----------|------------|-------------|
| (1) Bhoo  | (2) Gamlu    | (3) Stha  | (4) Drusir | (5) Asa     |
| (6) Isha  | (7) Likh     | (8) Kru   | (9) Churā' | (10) Labhā' |
| (11) Muda | (12) Bhashā' | (13) Ramu | (14) Vanda |             |

**Note:-** Prescribed book - **DAIVI VAK**

## Semester 2

### 1. RAGHOH AUDARYAM (Poetry)

From 1st SLOKA to 35th SLOKA of the 5th canto of Raghuvamsa of Kalidasa.

**Area of Study :-** Study of the Poet and the work, essay, contexts, word to word meaning of SLOKA 1 to 20 and the comprehension.

### 2. MATRU DESASYA AUJJWALYAM (Poetry)

From 1st SLOKA to 11th SLOKA, written by Dr. G.S.R. Krishna Murethy.

**Area of Study :-** Study of the Poet and the work, essay, contexts and the comprehension.

### 3. CHIKRODA KATHA (Prose)

Selected from 'Andhra Kavya Katha' of Sannidhanam Surya Narayana Sastry.

**Area of Study :-** Study of the Poet and the work, essay and contexts.

### 4. COMPUTER YANTRAM (Prose)

Written by Prof. K.V. Ramakrishnamacharya.

**Area of Study :-** Study of the Poet and the work, essay and contexts.

### SANDHI

- |                   |                    |               |              |                 |
|-------------------|--------------------|---------------|--------------|-----------------|
| (1) Savarna       | (2) Guna           | (3) Vrudhdhi  | (4) Yanadesa | (5) Ayavayava   |
| (6) Schutva       | (7) Stutva         | (8) Anumasika | (9) Jastva   | (10) Visargotva |
| (11) Visarga lopa | (12) Visarga Repha | (13) Ushma.   |              |                 |

**Area of Study :-** The study of division of words, joining of words with relevant Sandhi names.

### SAMASA

- |                  |                |             |                |
|------------------|----------------|-------------|----------------|
| (1) Ayyaveebhava | (2) Tatpurusha | (3) Dwandva | (4) Bahuvreehi |
| (5) Karmadharaya | (6) Dvigu.     |             |                |

**Area of Study :-** The study of 'Vigrahavakya' along with the name of Samasa.

**GOVERNMENT COLLEGE FOR WOMEN (UG&PG)**

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**DEPARTMENT OF SANSKRIT**

**SEMESTER - III**

**S.L. SANSKRIT MODULE - III**

Time - 2 1/5hrs

Marks = 75

**Section - A**

I. Translate any two slokas giving word to word meaning: 2x8=16

(4 Slokas from Pratimagruham of Pratimanatakam)

II. Answer any three annotations 3x5=15

(6 annotations from Pratimagruham + Shukanasopadeshah +  
Dakarakatha )

**Section B**

III. Write an essay any one of the following. 1x12=12

(2 essays from Pratimagruham )

IV. Write an essay any one of the following. 1x12=12

(2 essays from Shukanasopadeshah +  
Dakarakatha )

V. A. Decline fully any two of the following. 2x5=10

(4 Sabdas from prescribed part of the grammar)

B. Write short essay for any two of the following. 2x5=10

(4 topics from Kavayah Sastrakara vibhagah)

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**DEPARTMENT OF SANSKRIT**

**Units of MODULE –IV SEMESTER-IV 2015-2016**

Selected from the text book "Daivi vak-II" as prescribed by Osmania university.

1. Bharatasamskruteh Mulam - Sri Pullela Sriramachandrudu

6 act of Susamhatabharatam

Objectives: Study of the poet, work, selected verses translation, essay and annotations

2. Shishyanushasanam – Taittiriyanopanishad

Ekadasha anuvakah

Objectives: Study of Upanishads, essay and annotations

3. Bhojasya saraswati Sushama - Bhallala

Objectives: Study of the poet, work, essay and annotations

4. GRAMMAR

a. Alankarah

From prescribed grammar part of the text

b. Krudantaupani

From prescribed grammar part of the text



# Economics

## Semester 1

### SUBJECT – ECONOMICS I SEMESTER (MICRO ECONOMICS)

#### UNIT - I : INTRODUCTION

Nature and Scope of Economics,  
Definitions - wealth, welfare, scarcity & modern definitions,  
Methodology in Economics - Micro and Macro; Static and Dynamic,  
Normative and Positive; Inductive and Deductive methods,  
Equilibrium Analysis - Partial and General Equilibrium; Market Equilibrium,  
Choice as an economic problem.

#### UNIT - II : CONSUMER BEHAVIOUR

Demand Analysis - Law of Demand - price demand, income demand and cross demand,  
Elasticity of Demand - Price, Income and Cross Elasticity,  
Demand Forecasting - meaning and factors influencing demand,  
Utility Analysis - Cardinal and Ordinal Approaches,  
Law of Diminishing Marginal Utility, Law of Equi - Marginal utility, Consumer surplus -  
Engel Curve,  
Indifference curves - Properties of indifference curves - Price (Budget) line - Equilibrium of  
the consumer with the help of indifference curves - Price Consumption curve and Income  
Consumption curves,  
Derivation of demand curve from Indifference curves – uses of Indifference curve approach.

#### UNIT - III : PRODUCTION, COSTS AND REVENUE

Objectives of a firm; Production function - Law of variable proportions, Law of returns to  
scale,  
Cobb-Douglas production function, least cost combination,  
Isoquant curve, Factor substitution, Isocost curve, Expansion path,  
Cost Analysis - Types of costs, Nature of the costs and cost curves in short run and long run,  
Revenue Analysis - Different Concepts of Revenue, revenue curves in different market  
structure - perfect, imperfect and oligopoly.

**SUBJECT – ECONOMICS**  
**II SEMESTER**  
**(MICRO ECONOMICS)**

**UNIT - I : PERFECT COMPETITION AND MONOPOLY MARKETS**

Market forms - Perfect and imperfect markets,  
Perfect competition - Price Determination in market period, short and long period,  
Equilibrium of firm - Break - Even analysis,  
Equilibrium of a firm and industry under Perfect Competition in short-run and long-run,  
Monopoly - Price determination under monopoly and Price discrimination under monopoly.

**UNIT - II : MONOPOLISTIC COMPETITION DUOPOLY AND OLIGOPOLY MARKETS**

Monopolistic Competition - Characteristics - Equilibrium Price Determination, Selling Costs  
Duopoly,  
Oligopoly - Characteristics, Kinked demand curve - Sweezy model.

**UNIT - III : FACTORS PRICING**

Marginal Productivity theory of distribution,  
Theories of wage determination - Wages and collective bargaining - Minimum wage,  
Rent - Differential rent theory, Scarcity rent theory, Transfer earnings theory, Ricardian  
theory, Quasi rent,  
Interest - Classical and neo-classical theories, Liquidity preference theory,  
Profit - Dynamic, innovations, risk and uncertainty theories.

## Semester 3

### UNIT - I: NATIONAL INCOME

Meaning, Definitions and Importance of Macro Economics – National Income – Meaning, Definitions – GNP, NNP, GDP, NDP, PI, DI, Per Capita Income (PCI), Real Income, Methods of measuring National Income and trends in India, Simple Numerical illustrations – Classical theory of employment – Says Law of markets.

### UNIT - II: THEORIES OF EMPLOYMENT

Keynesian Theory of Employment, Effective Demand – Consumption Function – APC, MPC, APS & MPS, factors influencing consumption – Investment function – MEC and Rate of Interest and the Concept of Multiplier – Accelerator with Simple Numerical illustrations.

### UNIT - III: MONEY AND THEORIES OF MONEY

Meaning, Functions and Classification of Money – Gresham's Law – RBI Classification of Money – M1, M2, M3, M4. Theories of Money – Fisher's Quantity theory of Money, Cambridge Approach (Marshall and Keynes), Liquidity Preference.

IV SEMESTER  
(MACRO ECONOMICS - II)

**UNIT - I: TRADE CYCLES AND INFLATION**

Trade Cycles – Concept and Phases of Trade Cycles – Inflation – Concept, Types, Causes, Consequences, remedial Measures of Inflation and Recession.

**UNIT - II: BANKING AND NON - BANKING FINANCIAL INSTITUTIONS**

Banking – Commercial Banks – Concept, Functions – Credit Creation – Concept of Non-Banking Finance Companies (NBFC's) RBI – Functions – Methods of Credit Control.

**UNIT - III: STOCK MARKET AND INSURANCE**

Stock Market – Concept, Money and Capital Markets, functions and Importance – Concepts of (a) Shares (b) Debentures. Role of SEBI in regulation of Stock Market. Insurance – LIC and GIC.





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DEPARTMENT OF ECONOMICS

B.A. III YEAR SYLLABUS (2014-2015)

SUBJECT – ECONOMICS

V – SEMESTER, PAPER – V

INDIAN ECONOMY – I

**Module I: Economic Development**

Meaning of Economic Growth & Development, Measures of Economic Development - GNP, PCI, PQLI and HDI; Factors influencing economic development. Choice of Techniques, Inclusive Growth, Concept of Sustainable Development.

**Module II: Economic Growth Models & Plans**

Ragnar's Nurkes Balanced Growth Model; Hershmen Unbalanced Growth Model; Rostow's Stages of Economic Growth; Big Push Theory; Horrod-Domer Model of Economic Growth; Current Five Year Plan – Objectives and Allocation of Resources.

**Module III: Structure of the Indian Economy**

Basic features; Natural Resources – Land, Water & Forest Resources; Demographic Features – Growth of Population – Rural and Urban Population; National Income in India, Trends and Composition; Poverty; Unemployment; LPG Policies in India.

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DEPARTMENT OF ECONOMICS

B.A. III YEAR SYLLABUS (2014-2015)

SUBJECT – ECONOMICS

V – SEMESTER, PAPER – VI

PUBLIC FINANCE – I

### **Module I: Introduction of Public Finance**

Meaning, scope and Importance of Public Finance; Distinction between Public and Private finance; Public goods Vs Private goods; Principle of Maximum Social Advantage; Sources of Public Revenue - (a) Taxes (b) Administrative Revenues (c) Commercial revenues (d) Gifts and grants (e) Deficit Finance; Sources of Central, State Revenue in India.

### **Module II: Taxes and Public Expenditure**

Types of Taxes, Direct and Indirect Taxes – Merits and Demerits; Canons of Taxation – Impact, Shifting and Incidence of Taxation, Effects of taxation – The concept of Value Added Tax (VAT).

Meaning and Classification of Public expenditure, Principles of Public Expenditure – Reasons for the growth of Public expenditure – Wagner's law

### **Module III: Public Debt & Fiscal Policy**

Public Debt – Classification of Public Debt, Sources of Debt, Methods of Debt redemption – Causes and Effects of Public Debt.

Objectives of Fiscal Policy in India; Fiscal Policy Vs. Monetary Policy; Fiscal Responsibility.

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DEPARTMENT OF ECONOMICS

B.A. III YEAR SYLLABUS (2014-2015)

SUBJECT – ECONOMICS

VI – SEMESTER, PAPER – VII

INDIAN ECONOMY & A.P. ECONOMY – II

**Module I: Indian Agriculture Sector**

Nature and Importance of Agriculture; Trends in Agricultural area, Production and Productivity; Factors determining Productivity; Irrigation; New agricultural strategy; Agricultural marketing and prices; Rural Credit – Micro Finance and SHGs. The problem of food security.

**Module II: Industry and service Sector in India**

Structure, Growth and Employment of Industry ; Industrial Policies of 1956 and 1991; Growth and Problems of Small Scale Industries; Foreign Capital and Aid, FEMA; Disinvestment Policy in India; FDI ; Growing importance of service Sector in India; Education and Health.

**Module III: Andhra Pradesh Economy**

Gross State Domestic Product (GSDP) – Trends and Composition; Demographic features ; Agriculture – Land Utilization, cropping pattern and irrigation ; Industry – Growth Structure and Employment of Industry ; Poverty and Unemployment in Andhra Pradesh; Service sector in Andhra Pradesh.

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DEPARTMENT OF ECONOMICS

B.A. III YEAR SYLLABUS (2014-2015)

SUBJECT – ECONOMICS

VI – SEMESTER, PAPER – VIII

INTERNATIONAL ECONOMICS – II

**Module I: Theories of International Trade**

Inter - regional and International Trade; Importance of International Trade; Theories of International Trade - (a) Theory of Absolute Advantage (b) Theory of Comparative costs and (c) Heckscher – Ohlin Theory; Trade as an Engine of Economic Growth, Terms of Trade.

**Module II: Tariffs and Quotas – Balance of Payments**

Tariffs and Quotas, Concept of Optimum Tariff; Balance of Trade, Balance of Payments, India's Balance of Payments before and after 1991; Disequilibrium in BOP - Causes and adjustment.

**Module III: Foreign Trade in India**

Trends in the composition and direction of India's Foreign Trade; EXIM Policy; Role of International Agencies in India, it's Impact of IMF, IBRD, WTO; Multinational Corporations (MNC's); FERA & FEMA.



# Political Science

## (1<sup>st</sup> SEMESTER) (Political Concepts and Theories)

### **Unit I :**

- 1) **Introduction:**  
Definition, Scope and importance of the study of political science.
- 2) Approaches to the study of political science a) Liberal b) Marxist.

### **Unit II:**

- 1) **State:** Nation and Civil society.
- 2) **Sovereignty:** Monism and pluralism
- 3) **Theories of origin of state**
  - a) Social Contract b) Evolutionary (Historical)

### **Unit III:**

#### **Concepts:**

- a) Law and sources of Law, Concept of rule of law
- b) Liberty and equality; their relationship
- c) Theories and kinds of rights, Human Rights
- d) Power, Authority, Legitimacy
- e) Public policy; meaning, nature, scope and importance.



**III RD SEMESTER**  
( Indian Government and Politics )

**UNIT I**

1. a.) Evolution of Indian Constitution-Nationalist movement and philosophical foundations.  
b.) Nature of Indian state; Liberal and Marxist Perspective .
2. Salient features of Indian Constitution; Sources of INDIAN constitution .
3. Indian federation : centre state relations-recent trends.

**Unit II**

1. Fundamental Rights and duties, directive principles of state policy.
2. President, Election, powers and functions.
3. Prime minister and council of ministers.

**Unit III**

1. Parliament- Composition, Powers and functions.
2. Judiciary- Supreme court, Composition, Powers and functions.
3. Judicial Review and Judicial activism.

GOVT DEGR  
REG...

SYLLABUS  
(IV TH SEMISTER)  
INDIAN GOVERNMENT AND POLITICS

**UNIT I**

1. Party System National and Regional Parties T.R.S, T.D.P.,DMK etc, coalition politics.
2. Election Commission, Electoral reforms and Voting Behaviour.

**UNIT II**

1. State Government, Legislature, Structure, Functions, Governor, Chief Minister and Council of ministers, Powers and Functions, High court Powers and functions.
2. Challenges to National integration : Communalism and Terrorism; social Economic factors, language, Religion, caste and regional factors.

**UNIT III**

1. Social Movements Agrarian, Working Class, Women, Tribal, Dalit and Environmental Movements.
2. Local self Government institutions : Recent Trends, 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendments.

\*\*\*\*



**GOVERNMENT DEGREE COLLEGE (W)BEGUMPET, HYDERABAD**  
(Autonomous- Affiliated to Osmania University)  
Re- Accredited with 'B' Grade by NACC  
**POLITICAL SCIENCE PAPER IV**  
**SYLLABUS 2014-15**  
**V SEMESTER**  
**INTERNATIONAL RELATIONS**

**Unit-I**

Introduction:

International Relations: Evolution, Nature, Scope and Significance

**Unit-II**

History of International relations:

1. Rise of Sovereign State System – Modern State System
2. First World War- Causes and Consequences
3. Second world war -Causes and Consequences
4. Cold war: Phases- its impact on International Relations
5. Super Powers; Regional Powers, Hegemony

**Unit-III**

Concepts of International Relations

1. Power: Elements of National power
2. Unipolarity, Bipolarity and Multi Polarity
3. Security; Diplomacy
4. Developing Countries-Problems and Prospects

**Unit-IV**

International political economy

1. Colonization; Decolonization- Causes and Consequences, New International Economic Order
2. Developing Countries-Problems and Prospects
3. World Bank-IMF; IBRD-Functions and Role
4. World Trade Organization (W.T.O): Functions and Role

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**POLITICAL SCIENCE**

**PAPER III**

**SYLLABUS 2014-15**

**VI SEMESTER**

**POLITICAL THOUGHT**

**Unit-I**

**Introduction**

1. PLATO - Ideal State
2. Aristotle - Theory of state; Classification of Governments.

**Unit-II**

3. St. Thomas Aquinas - state and church, Laws.
4. Machiavelli- State Craft

**Unit-II**

**Contractualists:**

5. Thomas Hobbes- state of nature, Theory of social contract- Absolute of Theory of sovereignty
6. John Locke- Theory of social contract, Theory of Natural Rights, Limited sovereignty
7. Jean Jacques Rousseau - State of nature, Theory of social contract, theory of general will,

**Unit-IV**

**Utilitarians**

8. Jerry Bentham - Utilitarianism
9. J.S.Mill -Utilitarianism, "On liberty", Individualism, Representative Government,

**Unit-V**

10. Hegel- Theory of Dialectics, Theory of state
11. Karl Marx - Materialism, Class War & Communism
12. Gramsci- Hegemony, Civil Society

*K. Renu Kanari*

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**POLITICAL SCIENCE PAPER IV**

**SYLLABUS 2014-15**

**VI SEMESTER**

**INTERNATIONAL RELATIONS**

**Unit-I**

**International Organizations**

1. From League of Nations to United Nations - an Evaluation
2. United Nations – Structure and Functions, Reforms
3. Regional organizations – a) European Union  
b) SAARC
4. Globalization- Factors responsible for Globalization and its Impact

**Unit-II**

**International Security**

1. Arms Race
2. Arms control and Disarmament
3. Issues in Nuclear Politics

**Unit-III**

**Foreign Policy**

1. India's Foreign policy- Determinants and features
2. Non- Alignment –Evaluation

**Unit-IV**

**Contemporary Issues in International Relations**

1. Environmental Issues
2. Human Rights Issues
3. Terrorism – causes & Types

# Public Administration

**Government Degree College for Women, Begumpet, Hyderabad**

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**FACULTY OF PUBLIC ADMINISTRATION**  
**B.A. PUBLIC ADMINISTRATION SYLLABUS**

## **PAPER -1 (SEMESTER-1)**

1. **UNIT -1** **INTERODUCTION:**
  1. Meaning, Nature, Scope, importance of Public administration.
  2. State and Evolution of Public Administration.
  3. Relationship with other social science-Political
  
2. **UNIT-II** **THEORIES OF ADMINISTRATION:**
  1. Classical Approach : Henry Fayol,  
Luther Gullick  
Lyndal Urwick
  2. Scientific Management Approach: F.W. Taylor
  3. Bureaucratic Approach : Max Webber  
Karl Max
  
3. **UNIT-III** **CONCEPTS OF ADMINISTRATION**
  1. Administrative Planning
  2. Leadership
  3. Supervision



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**FACULTY OF PUBLIC ADMINISTRATION**  
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**PAPER -II (SEMESTER-II)**

1. UNIT -1

**INTERODUCTION:**

- 1 Political and Administration Dichotomy-Woodrow Wilson and F.J. Goodnow.
2. **Emerging Trends** : New public Administration-I & II  
Minnow Brook
3. New Public Management perspective.

2. UNIT-II

**THEORIES OF ADMINISTRATION:**

1. Behaviourial Approach : Chester Bernard  
Herbert Simon
2. Socio- Psychological Approach : Hyrairchy of Needs  
Abraham Maslow  
Douglas Mc. Gregor  
Theory-x, Theory-y
3. Ecological Approach- Riggs
4. Human Relations Approach Elton Mayo

3. UNIT-III

**CONCEPTS OF ADMINISTRATION**

1. Communication and Public Relations
2. **Emerging Trends** : Public Administration in the context of Globalisation. Privatisation and Liberalisation
3. Post modern Public Administration
4. Governance

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**FACULTY OF PUBLIC ADMINISTRATION**

**SEMESTER – III 2<sup>nd</sup> B.A.**

**CHAPTER – I INTRODUCTION**

1. Continuity and change of Indian Administration after Independence.  
Ancient Indian Administration, Medieval and Modern Administration.
2. Social, Economic and Political context of Indian Administration.

**CHAPTER – II UNION ADMINISTRATION**

3. Central Government :
  - a. President of India
  - b. Vice – President of India
  - c. Prime Minister of India
  - d. Union Council of Ministers
  - e. Union Cabinet
  - f. Cabinet Secretariat
  - g. Cabinet Committees
  - h. Prime Minister's Office
4. Union Government and its Agencies:
  - a. All India Services – UPSC, SPSC.
  - b. Planning Commission
  - c. Finance Commission
  - d. Inter – State Council
  - e. Centre – State Relations
  - f. National Development Council.
5. Public Enterprises in India – Forms of Public Enterprises.

**CHAPTER – III STATE GOVERNMENT**

6. State Government
  - a. Governor
  - b. Chief Minister
  - c. State Council of Ministers
7. State Secretariat and Directorates
  - a. General Administration and Chief Secretary

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**FACULTY OF PUBLIC ADMINISTRATION**  
**SEMESTER – IV 2<sup>nd</sup> B.A.**

**CHAPTER – I                      DISTRICT ADMINISTRATION**

1. Changing Role of District Collector.
2. District Administration in Andhra Pradesh.
3. Local Administration – Rural and Urban structures and functions in Andhra Pradesh
  - a. Zilla Parishad
  - b. Mandal Parishad
  - c. Village Panchayat
4. 73<sup>rd</sup> & 74<sup>th</sup> Constitutional Amendment Acts.

**CHAPTER – II                      ADMINISTRATIVE ACCOUNTABILITY**

5. Control Over Administration :
  - a. Executive, Legislative and Judicial.
  - b. Lokpal, Lokayukta and Central Vigilance Commission.
  - c. Consumer Protection Forum.
  - d. Right to Information Act.
  - e. National and State Human Rights Commission.
6. Administrative of Welfare Programmes for Weaker Sections – SC, ST, BC, Women and Minority.

**CHAPTER – III                      EMERGING ISSUES**

7. Meaning of Administrative Reforms – 1<sup>st</sup> and 2<sup>nd</sup> ARC recommendations, Recommendations of important Commissions.
8. Mechanism for Disaster Management --- National, State and District Level.
9. Governance and E – Governance applications in Indian Administration.
10. Public Private Partnership, Voluntary Sector, Privatization and Disinvestment.

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FACULTY OF PUBLIC ADMINISTRATION

SEMESTER – V FINAL YEAR B.A.

MANAGEMENT OF RESOURCES - PAPER-V

SYLLABUS

CHAPTER - I HUMAN RESOURCE MANAGEMENT

1. Meaning, Nature, Scope and Significance of Human Resource Management
2. Human Resource Strategy and Planning
3. Recruitment, Selection, Appointment and Promotion
4. Pay – Components, Principles of Pay and Pay Commissions.

CHAPTER - II CAPACITY BUILDING

5. Performance Appraisal – Rewards and Incentives Management.
6. Human Resource Development – Concept of HRD; Training – Objectives, Types, Evaluation.
7. Employee Capacity Building Strategies.

CHAPTER - III ISSUES IN HRM

8. Total Quality Management.
9. Human Resource Management Effectiveness and Human Resource Audit.
10. Issues in HRM – Downsizing, Outsourcing, Consultancies.

Board of Studies




Chairman BOS



University Nominee

Chairman BOS of BOS  
Department of Public Administration,  
Osmania University, Hyd-7, -

Members

1. 
2. 
3. 
4. V.V. Mallikarjuna

PRINCII



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FACULTY OF PUBLIC ADMINISTRATION

SEMESTER – V: FINAL YEAR B.A.

RURAL LOCAL GOVERNANCE IN INDIA - PAPER - VI

SYLLABUS

CHAPTER I CONCEPT OF DEMOCRATIC DECENTRALIZATION

1. Local Government – Concept, Features and Importance.
2. Democratic Decentralization – Concept, Evolution and Significance.
3. Evolution of Local Government in India – Community Development Programme and National Extension Service.

CHAPTER II RURAL LOCAL GOVERNANCE

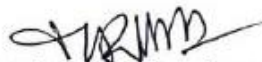
4. Balwanth Rai Mehta and Ashok Mehta Committee Reports - Structures, Functions and Finances, Second Generation and Third Generation Panchayats.
5. Reforms in Panchayat Raj – Features of 73<sup>rd</sup> CAA and Organizational structures for Panchayat Raj.
6. Intra – Rural Local Government relationships: Gram Sabha and Gram Panchayats; Distribution of Powers and Functions; Intra Tier responsibilities (The Eleventh Schedule).

CHAPTER III ISSUES AND TRENDS

7. State Control and Supervision over Local Bodies.
8. Micro Planning and implementation, Social Audit, Capacity Building Grassroots functionaries.

Board of Studies

Chairman BOS


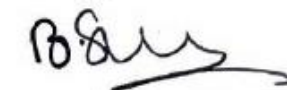

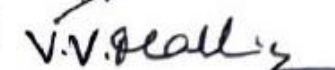


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**FACULTY OF PUBLIC ADMINISTRATION**

**SEMESTER – VI FINAL B.A.**

**MANAGEMENT OF RESOURCES - PAPER - VII**

**CHAPTER I BUDGETARY PROCESS IN INDIA**

1. Meaning, Scope and Importance of Financial Management.
2. Budget, Concept, Principles of Budgeting, Preparation, Enactment and Execution of Budget.
3. Organization and functions of the Finance Ministry in India.

**CHAPTER II FINANCIAL ADMINISTRATION**

4. Union State Financial Relations.
5. Finance Commission.
6. Parliamentary Financial Committees – Public Accounts Committee, Estimates Committee, Committee on Undertaking, and Comptroller and Auditor General of India

**CHAPTER III MATERIALS MANAGEMENT**

7. Procurement.
8. Storage and Distribution.
9. Logistics Management.

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**FACULTY OF PUBLIC ADMINISTRATION**

**SEMESTER – VI. FINAL YEAR B.A.**

**URBAN LOCAL GOVERNANCE IN INDIA - PAPER - VIII**

**SYLLABUS**

**CHAPTER I CONCEPT OF URBANIZATION**

1. Urbanization in India and Policies and Strategies.
2. Evolution of Urban Local Governments in India : Reforms in Urban Local Bodies – Features of 74<sup>th</sup> CAA, XII Schedule.

**CHAPTER II URBAN LOCAL GOVERNANCE**

3. Urban Local Government - Structure, functions, officials, Committee System, Finances, Officials and Political executives (with special reference to Andhra Pradesh).
4. Municipal Corporations: Structure, Committee System, Finances, Officials and Political executives (with special reference in Andhra Pradesh).
5. Urban Development Authorities in Andhra Pradesh and their working.

**CHAPTER III ISSUES AND TRENDS**

6. Parallel bodies and Voluntary Sector: Self Help Groups, Users Association and Parastatals.
7. Sustainable Development and Challenges to Decentralized Governance.

# Computer Applications



**Government College for Women Begumpet, Hyderabad-500016**  
**(An Autonomous college of Osmania University)**  
**Re-Accredited by NACC with 'B' Grade**  
**B.A I YEAR COMPUTER APPLICATIONS**  
**PC SOFTWARE**

**SEMESTER-I**

**MAX MARKS:50 T/H**  
**P.P.W:5(3+2)**

**UNIT - I**

**Introduction to Computers:** Characteristics and evolution of computers, Computer generations.

**Basic Computer Organisation :** Input, Output, Storage, Arithmetic Logic Control Central processing units.

**UNIT - II**

**Number systems:** Binary, Octal Hexadecimal and decimal number systems, converting from one number system to another fractional numbers.

**Computer Codes:** BCD.BBCDIC and ASCII codes, Collating sequence  
**Computr Arithmetic:** Binary Arithmetic Boolean Algebra: Boolean algebra and functions. Logic gates and logiccircuits, Primary Storage locations and addresses.Storage capacity RAM.ROM PROM AND EPROM.

**UNIT -III**

**Secondary Storage Device:** Sequential and direct access devices, Magnetic tape tape cassettes Magnetic disk and floppy disk. Vinchester disk. Storage hierarchy.

**INPUT/OUTPUT DEVICES:** Magnetic Media Devices, Printers Key boards scanners and other devices.

**UNIT -IV**

**Computer Software:** Relationship between Hardware and Software type of Software .Acquiring Software. Firmware. Planning the Computer Programme: Algorithms, Flowcharts Decisions, Tables Pseudocode.

**LAB WORK:**

**PRACTICALS:**

**MS-OFFICE**

Government College for Women Begumpet, Hyderabad-500016  
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B.A I YEAR COMPUTER APPLICATIONS  
C- LANGUAGE  
SEMESTER-II

MAX MARKS:50 T/H

**UNIT-I**

P.P.W:5(3+2)

**Introduction to C Language:** Variable names data types and sizes, Constants, Declaration. Arithmetic relational and logical operators.Type conversions. Increment and decrement operators. Bitwise operation. Assignment operators and expressions. Conditional expressions. Precedence and order of evaluation.

**UNIT-II**

**Control Flow:** Statements and blocks if else else-if switch statement while for do while loops, break and continue Go to and labels.

**UNIT-III**

**Input and output:** Standard input and output Formatted input and output print and scan statements. input and output.

**UNIT-IV**

**Arrays:** Creation and manipulation of Arrays.Concepts of Functions Pointers Structures.

**LAB WORK:**

**PRACTICALS:**

**PROGRAMMING IN 'C'**

GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD - 16  
(An Autonomous college of Osmania University)  
Re-Accredited by NACC with 'B' Grade  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS  
B.A II YEAR COMPUTER APPLICATIONS  
SEMESTER-III  
SUBJECT: OOPS WITH C++  
SYLLABUS  
Hrs: (3T+2PR)

UNIT - I

Basic Concepts of oop: Comparison of procedural programming and oop. Advantages of oop and oop Languages, definition of Class, Objects, Inheritance. Definition Encapsulation, Operator over Loading and Dynamic Binding.  
Over view of oop using c++: Basic Program Construction and Program Statement, Class Declaration, comments and C++ Compilation.  
Elements of C++ Language: Tokens and Identifiers, Variables and Constants, Data Types, operators.

UNIT - II

Control Statements: The if Statement, if-else Statement, Switch Statements.  
Loops: For Loop and While-do Statements, break, Continue and goto Statements.  
Control Statements: The if Statement, if-else Statement, Switch Statements.  
Loops: For Loop and While-do Statements, break, Continue and goto Statements.  
Classes and Objects: Declaration of classes and Objects in C++, Objects as function arguments.  
Object from Function, Structures and Classes.  
Constructors and Destructors and Constructors, Dynamic initialization of Objects, constructors, Dynamic constructors, Destructors.

UNIT - III

Constraints on Constructors and destructors, Operator overloading, Overloading unary operators: operator keyword, Argument and Return values and Limitations of increment operators  
Overloading binary operators: Arithmetic operators example: Addition of polar coordinate and concatenation of strings. Multiple Overloading and comparison of Arithmetic, Assignment operators.

UNIT-IV

Data and type conversion: conversion between basic types, conversion between objects and basic types. Derived classes and inheritance: Derived classes and base class, Derived class constructor, overriding the member functions, class Hierarchies.  
Inheritance: Public and private Inheritance, Access combinations and usage Polymorphism:  
Introduction to polymorphism, Operator Overloading, Polymorphism by parameters, Runtime Polymorphism, Multiple Inheritance, Different uses and concepts of polymorphism.



GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD – 16  
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DEPARTMENT OF COMPUTER SCIENCE /APPLICATIONS  
B.A II YEAR COMPUTER APPLICATIONS  
SEMESTER-IV  
SUBJECT: DBMS  
SYLLABUS

Hrs:(3T+2PR)

UNIT-I

Overview of Data base Management:

Data, Information and Knowledge increase use of data as a corporate resource,  
Data processing Vs Data management, File-oriented approach to data  
Management, File-oriented approach Vs Database-oriented approach to data management, Data In  
depend administration roles.

UNIT-II

DBMS architecture, Different kinds of DBMS Susers, Importance of data dictionary and contents of  
data dictionary, types of database languages, Introduction to SQL, DEMO ON DATA DEFINITION  
LANGUAGE COMMANDS, DEMO AND DATA MANUPULATION LANGUAGE  
COMMANDS.

UNIT-III

Entity- Relationship Models: Basic Concepts, Design Issues, Mapping Constraints, Keys.  
Entity-Relationship Diagram, Weak Entity Sets, Extended E-R Diagram,  
Design of E-R Diagram, Design of E\_R database schema, Reduction of an E-R database schema,  
Reduction of an E-R schema to tables

UNIT-IV

DEMO ON TABLE EXPRESSIONS, DEMO ON CONDITIONAL EXPRESSIONS, DEMO ON  
SCALAR EXPRESSIONS,  
DEMO ON TRANSACTION CONTROL LANGUAGE COMMANDS,  
DEMO ON TRANSACTION CONTROL LANGUAGE COMMANDS,  
Relational Model: Structure of Relational databases, The Relational algebra, The Tuple Relational  
algebra operations, Relational database design, pitfalls.  
Decomposition, 1NF, 2NF, 3NF BCNF.

Suggested Books:

Prescribed Books:

Database System concepts: Peter Rob Corlos Cornol

Modern Database Management Fifth edition: McFadden, Hoffer, Prescottt

Reference Books:

Database Management system Third Edition: Ramakrishnan, Gehrke

Database Management and Design Second Edition: Gary W.Hansen, James W.Hansen



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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS  
B.A. COMPUTER APPLICATIONS  
SEMESTER-V  
SUBJECT: JAVA PROGRAMMING (Part-I)  
PAPER-V  
SYLLABUS

Hrs: (3T+2PR)

**UNIT-1:** Introduction to Java, language and Importance of Java on Internet. Java Buzz words, object oriented programming and Java Demo on sample program and compiling the program, Data Types.

**UNIT-2** Variables [Declaration Dynamic Initialisation and scope & lifetime] Type conversion, Arrays, operators [Arithmetic, Relational Boolean] Java control statement Iteration statements, Iteration statements Jump statement Introduction to Classes and objects.

**UNIT-3** Introduction to methods and constructors Garbage Collection Introduction to Overloading. Overloading in detail, Introduction to inheritance, Inheritance in detail. Introduction to multiple hierarchy and in detail, Introduction to abstract classes in detail.

**UNIT-4** Packages and Interfaces :- Introduction to package and in detail, Access protection with examples, Important packages Interfaces: Defining and Implementing and with examples, exception Handling. Fundamentals, different types of exception handling use of Try, catch, throw, throws and finally.

Suggested Reading:

Prescribed Books:

Java Complete reference: Herbert Schildt

Reference Books:

Java 2.0: Ivan Bayross

Java Tutorial: Sun microsystems

Special edition using Java 2: Joseph L. Weber

Programming with Java: E. Balagurusamy

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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS  
COMPUTER APPLICATIONS

B.A . . . . .  
SEMESTER-VI

SUBJECT: JAVA PROGRAMMING (Part-II)

PAPER- VII

SYLLABUS

Hrs: (3T+2PR)

**UNIT-1** : Built-in exception, I/P-O/P: I/O Basic reading console i/p & writing console o/p  
Reading and writing string Handling string constructor, spl. String operators character  
extraction string comparison searching and modifying strings Data conversion string buffer  
Applet basics architecture of applets

**UNIT-2** : Some simple applet display methods requesting repainting, using the status  
- window understanding the HTML applet tags. Passing parameter to applet event model,  
event model, event classes, sources of events, event listener Interfaces, adapter classes and  
Inner classes.

**UNIT-3** : Introduction to AWT classes window fundamentals, frame windows, creating a  
frame window, creating windowed program and sizing graphics, color and use of font  
methics using AWT controls, lists and using buttons, check box group and using buttons,  
check box group and choice control using list and managing scroll bars, using text file and  
text area.

**UNIT-4** : Understanding layout Management: form layout , border layout, Menus and acialoj  
boxes, files dialog and exploring the controls, Menus and layout manager.

Suggested Reading:

Prescribed Books:

Java Complete reference: Herbert Schildt

Reference Books:

Java 2.0: Ivan Bayross

Java Tutorial: Sun microsystems

Special edition using Java 2: Joseph L. Weber

Programming with Java: E. Balagurusamy

**GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD – 16**

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**B.A . . . . . COMPUTER APPLICATIONS**

**SEMESTER-V**

**SUBJECT: JAVA PROGRAMMING(Part-I)**

**PAPER-V**

**SYLLABUS**

**Hrs:(3T+2PR)**

**UNIT-1:** Introduction to Java, language and Importance of Java on Internet. Java Buzz words, object oriented programming and Java Demo on sample program and compiling the program, Data Types.

**UNIT-2** Variables [Declaration Dynamic Initialisation and scope & lifetime] Type conversion, Arrays, operators [ Arithmetic, Relational Boolean] Java control statement Iteration statements, Iteration statements Jump statement Introduction to Classes and objects.

**UNIT-3** Introduction to methods and constructors Garbage Collection Introduction to Overloading. Overloading in detail, Introduction to inheritance, Inheritance in detail. Introduction to multiple hierarchy and in detail, Introduction to abstract classes in detail.

**UNIT-4** Packages and Inter faces :- Introduction to package and in detail, Access protection with examples, Important packages Interfaces: Defining and Implementing and with examples, exception Handling, Fundamentals, different types of exception handling use of Try, catch, throw, throws and finally.

Suggested Reading:

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Reference Books:

Java 2.0:Ivan Bayross

Java Tutorial:Sun microsystems

Special edition using Java 2:Joseph L. Weber

Programming with Java:E.Balagurusamy



GOVERNMENT DEGREE COLLEGE FOR WOMEN, BEGUMPET, HYDERABAD -  
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Re-Accredited by NACC with 'B' Grade  
DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS  
B.A. COMPUTER APPLICATIONS  
SEMESTER-VI  
SUBJECT: JAVA PROGRAMMING (Part-II)  
PAPER-VII  
SYLLABUS

Hrs:(3T+2PR)

**UNIT-1** : Built-in exception, I/P-O/P: I/O Basic reading console i/p & writing console o/p  
Reading and writing string Handling string constructor, spl. String operators character  
extraction string comparison searching and modifying strings Data conversion string buffer  
Applet basics architecture of applets

**UNIT-2** : Some simple applet display methods requesting repainting, using the status  
window understanding the HTML applet tags. Passing parameter to applet event model,  
event model, event classes, sources of events, event listener Interfaces, adapter classes and  
Inner classes.

**UNIT-3** : Introduction to AWT classes window fundamentals, frame windows, creating a  
frame window, creating windowed program and sizing graphics, color and use of font  
methics using AWT controls, lists and using buttons, check box group and using buttons,  
check box group and choice control using list and managing scroll bars, using text file and  
text area.

**UNIT-4** : Understanding layout Management: form layout , border layout, Menus and dialog  
boxes, files dialog and exploring the controls, Menus and layout manager.

Suggested Reading:

Prescribed Books:

Java Complete reference: Herbert Schildt

Reference Books:

Java 2.0:Ivan Bayross

Java Tutorial:Sun microsystems

Special edition using Java 2:Joseph L.Weber

Programming with Java:E.Balagurusamy



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DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS  
B.A III YEAR COMPUTER APPLICATIONS  
SEMESTER-V  
PAPER--VI  
SUBJECT: WEB TECHNOLOGIES(Part-I)  
SYLLABUS

Hrs:(3T+2PR)

- UNIT I : Introduction to Internet basics, Client & Server technology Inter connectivity. Web client/ browser, available.
- UNIT II : Introduction to HTML (Hypertext markup language), HTML commands, Titles & Footers, Text formatting, Text Styles, Lists, Text effect - Adding Graphics to Html document, tables, Linking of documents, Frames some exercises.
- UNIT III : Introduction to Java Script Java Script in Web pages, Advantages of Java Script, writing Java Script into HTML, Building Java Script syntax, Operators & Expressions in Java Script Java Script programming constructs
- UNIT IV: Conditional checking statements, Loops & Functions in Java Script Dialog boxes some exercises.

Suggested Reading:

Prescribed Books: HTML, DHTML, JAVASCRIPT, PERL, CGI: Ivon bayross

The complete reference Webdesign: Thomas A. Powel

Reference Books: Scripting Language and Webdesigning: R.singh, Mamatha varma.s. Mahindru  
World wide Web : Rick Stout

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**B.A III YEAR COMPUTER APPLICATIONS**

**SEMESTER-VI PAPER- VIII**

**SUBJECT: WEB TECHNOLOGIES (Part-II)**

**SYLLABUS**

Hrs:(3T+2PR)

**UNIT I** : Introduction to CGI (Common Gateway Interface) why is CGI used  
working of CGI small exercises on CGI.

**UNIT II** : Introduction to Perl – Per basics, Perl string need for data storage,  
Arrays, Indexed Arrays & Hashed Arrays, Environment variables some  
- exercises, Operators

**UNIT III** : Comparing program flow in Perl using UNLESS statement. Perl  
Functions-String functions, Concatenating strings, Repeating strings

**UNIT IV** : File handling, opening & closing of files. Database Connectivity –  
ODBC object methods.

Suggested Reading:

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The complete reference Webdesign: Thomas A. Powel

Reference Books: Scripting Language and Webdesigning: R. Singh, Mamatha varma. s. Mahindru

World wide Web : Rick Stout

# Mass communication and Journalism

## Semester 1

### **Introduction to Mass Communication & Journalism**

**Unit I** : Communication – Concept of Communication and Journalism, definition, need and scope , Nature, process and elements of communication, Functions and barriers of communication, - its role in society. Types of Communication -Intra-personal, Interpersonal, Group Communication and Mass Communication.

**Unit II**: Mass Communication - Print, Radio, Television , film, Internet.. Process of Mass Communication. Elements. Functions of Mass Media in society - Providing information, education and entertainment. Mass Communication and their characteristics, limitations.

**Unit III**: Types of media – Print (Newspapers, books and magazines).Broadcast media (Radio, Television, Film Internet). Traditional media (Folk media). Types of newspapers and Magazines - Regular, Financials, Political newspapers. General interest magazines and special interest magazines.

## Semester 2

### **Broadcast Journalism and New Media**

**Unit I:** Public Broadcasting – Concept, nature, need and scope. Status of private broadcasting. All India Radio its role and its social responsibility. Brief history of broadcasting in India.

**Unit II** Status of Television, Role of Doordarshan in society. Different formats of TV - News, features, soaps, sitcoms, serials, jingles, talk shows, reality shows, game shows and documentaries.

**Unit III:** Film industry. Brief history of Cinema. Milestones of industry. Types of films. Introduction to new media – internet and www, search engines – online journalism. Ethical issues in new media.



## Semester 3

### **Writing for Print Media**

**Unit I:** Concept of News – Definition, News Values. Principles of Modern Journalism, Cannons of Journalism News process - from the event to the reader.

**Unit II:** Reporting - Profile of a Reporter - The nose for news – Attitude, Knowledge and skills. Personal qualities and qualifications of a Reporter. Dos and Don'ts for a reporter. Beats

**Unit III: The News Story Structure** – elements of news story – 5Ws and H, inverted pyramid style. Types of Intros, the body and language of news. Different forms of newspaper writing—spot news, features, articles, interviews editorials and creative middles.

## Semester 4

### Editing

**Unit I :** The Editorial Department – News bureau and editorial desk in a newspaper - The Editor – The News Editor – Night Editor.

**Unit II:** Sub-Editing – The chief Sub-editor- The Sub-editors (different Desks) – The copy editor – Journalistic language and style. Considerations of space and time. Readability. Legal issues

**Unit III :** Make –up of News paper - Proof reading – Photo- cropping Proof-correction symbols and examples illustrating their use and printing methods

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DEPARTMENT OF JOURNALISM

FINAL YEAR SYLLABUS 2014-15

SEMESTER V

### Advertising

- Unit I:** Advertising - Definition, nature and scope of advertising  
Social relevance of advertising, function of advertising in society in India
- Unit-II:** Types of advertising  
Classification of different types of advertisements  
Forms of advertising through different Media and their relative merits and demerit planning product analysis and market research.
- Unit III:** Creating the advertisement: visualising and copy writing.  
Preparation of an ad from rough sketch to final release.  
Kinds of copy.

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**FINAL YEAR SYLLABUS 2014-15**

**SEMESTER VII**

**PUBLIC RELATIONS**

**Unit I :** Introduction to Public Relations: Definition, nature and scope  
Need for Public relations, public opinion and propaganda.

**Unit II** :Organisation and functions of a PR department,  
Tools of PR Internal and external publics of an organisation,  
Tools of effective communication between an organisation and  
its different publics.

**Unit III:** Public relations in Public sector PR  
PR in Government departments,  
PIB, DIPR, DAVP and DFP Corporate Communications



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**FINAL YEAR SYLLABUS 2014-15**

**SEMESTER VI**

**Media and Development**

**Unit I:** Understanding economic development and human development—education, health, nutrition, population, environment, gender issues, problems of dalits and tribals.

**Unit II;** Coverage of Development issues in print and electronic media. Folk and traditional media and their role in development communication.

**Unit III:** Development of Andhra Pradesh - Agriculture, irrigation, industrial development, employment, social sector—education, health, population etc.

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**FINAL YEAR SYLLABUS 2014-15**

**SEMESTER VIII**

**DEVELOPMENT COMMUNICATIONS**

**Unit I:** Development, employment and welfare programmes of central and state governments. Use of different media in promoting development programmes.

**Unit II:** Effectiveness of demonstrations, group discussions, meetings and field visits. Introduction to extension. Government agencies in development.

**Unit II:** Writing on developmental issues, reports, interviews, articles and features. Development related features and special pages in newspapers, development related magazines and development related programmes on radio and television.

## Communicative English

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B.A. (VOCATIONAL) COURSE IN COMMUNICATIVE ENGLISH SYLLABUS  
SEMESTER - I  
PAPER I – PHONETICS

Objectives: To enable the students to acquire skills in phonetics required for Oral Skills.

Teaching hours per week: Theory 3 hrs Practical 3 hrs

Mode of Examination: Theory 75 Marks Practical 50 Marks

Unit – 1 The speech organs, production of sounds, points and manner of articulation,

Unit – 2 Speech sounds, vowels and consonants, consonant clusters

Unit – 3 Homophones, Homonyms, phonetic symbols, using the dictionary for pronunciation

Unit – 4 Stress and Intonation, Accent

Practical: Intensive Drilling in Phonetic Skills, Speech Sounds, Word Stress and accent – Sentence stress and intonation

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B.A.(VOCATIONAL) COURSE IN COMMUNICATIVE ENGLISH SYLLABUS  
SEMESTER – II  
PAPER II – REMEDIAL GRAMMAR

Objectives: To eradicate errors in Grammar in Speech and Writing

Teaching hours per week: Theory – 3 hrs, Practical – 3 hrs

Mode of Examination: Theory – 125 Marks

- Unit – 1 Parts of Speech, Verbs – Transitive, Intransitive, Regular and Irregular, Linking Verbs, Verbs and Adverbs
- Unit – 2 Agreement between subject and Verb (Concord) Helping Verbs
- Unit – 3 Articles, Negative Sentences, Questions and Question Tags
- Unit – 4 Tenses and their uses, Transformation of sentences – Active / Passive, Simple / Compound / Complex
- Unit – 5 Degrees of Comparison – Positive, Comparative and superlative, Transformation of sentences in Degrees of comparison
- Unit – 6 Singular & Plural, the Possessive case, Adjectives, Active & Passive voice
- Unit – 7 Adverbial use of No. Not and None confusion with regard to use of Participles, Prepositions, Negative verbs, the use of Correlative, use of Who, Whom, Much and Many, Still and Yet, So that, So as and courtesy words like Please & Thank You.



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**Department of Communicative English**  
**Semester III**  
**CONVERSATIONAL ENGLISH - PAPER III**

**I. LANGUAGE & SOCIETY**

1. Dialects & Idiolect-Isogloss
2. Linguistic Maps & Mutual Intelligibility
3. Bilingualism-Code Mixing & Code Switching

**II. STYLES**

1. Formal & Informal Styles

**III. REGISTERS**

1. Variations of Register
2. Factors that condition Register variations
  - a. Field of Discourse
  - b. Mode of Discourse
  - c. Style of Discourse

**IV. LANGUAGE & COMMUNICATION**

1. Language as a Symbolic System
2. Charles Hockettes' design features to distinguish language from animal communication
3. What is Communication
  - a. Oral Communication
  - b. Written Communication
  - c. Audio Visual
  - d. Visual

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Department of Communicative English  
Semester IV

**INTRODUCTION TO BROADCASTING MEDIA & WRITING SKILLS - PAPER IV**

**Section-A**

**I. FUNDAMENTALS OF BROADCASTING**

1. Definition of Broadcasting
2. Language Characteristics
  - a. Animal Communication Vs Human Language
  - b. Speech & Writing
  - c. Milestones in Human Communication
  - d. Forms of Communication
  - e. Types of Communication (Interpersonal, Intrapersonal & Mass Communication)
  - f. Job Opportunities in Broadcasting

**II. RADIO AS MEDIUM OF COMMUNICATION**

1. Basic Concepts of Transmission of Signals
  - a. Waves
  - b. Frequency
  - c. Cycle
  - d. Oscillation
  - e. Modulation-BFM, AM
2. Radio as Educational, Instructional & Entertainment Medium
3. Current Status of Radio-Radio in comparison with other forms of Mass Communication

**III. TV AS MEDIUM OF COMMUNICATION**

1. The Beginings of TV
2. TV Camera-Creation of Pictures & Sounds
  - a. Microphone
  - b. Carrier Waves-Sound & Picture Reception in A Tv Set

- c. Color TV Camera
- d. Television in India

#### **IV. TV AS EDUCATIONAL MEDIA**

1. SITE-Inception & Development
2. Educational Programs  
CEC, IGNOU, NCERT, NOS-Country Wide Class Room Programs
3. General Knowledge & Current Affairs  
News Papers & Manorama Year Book

#### **Section-B**

##### **Writing Skills**

1. Imaginative Use of Parts of Speech
2. Paragraph Writing
3. Sentence Connectors and Cohesion
4. Substitution and Ellipsis
5. Substantive Variations & Re-Writing of Sentences
6. Imaginative Features
7. Idioms & Phrases