యోగి వేమన విశ్వవిద్యాలయం, కడప, ఆంధ్ర ప్రదేశ్
Yogi Vemana University
KADAPA, ANDHRA PRADESH - 516 003

Yogi Vemana University Syllabus

2017-18

III Semester to IV semester

YOGI VEMANA UNIVERSITY
GENERAL ENGLISH SYLLABUS
FOR B.A/B.Com/B.Sc COURSES under CBCS

SEMESTER –III

Unit – I
PROSE

1. M.K. Gandhi: Shyness My Shield (from The Story of My Experiments with Truth)
2. Alexis C. Madrigal: Why People Really Love Technology: An Interview with Genevieve Bell

Unit – II
POETRY

1. Gabriel Okara: Once upon a Time
2. Seamus Heaney: Digging

Unit – III
SHORT STORY

1. JhumpaLahiri: The Interpreter of Maladies
2. Shashi Deshpande: The Beloved Charioteer

Unit – IV
ONE ACT PLAY

GurajadaAppa Rao: Kanyasulkam, translated by C. Vijayasree& T. VijayaKumar (Acts I & II)

Unit – V
LANGUAGE ACTIVITY

1. Classroom and Laboratory Activities
   i. JAM Sessions
   ii. Note Taking
   iii. Reporting for the Media
   iv. Expansion of an idea
2. Classroom Activity
   i. Transformation of sentences (Simple-Complex-Compound Sentences)
   ii. Note Making
   iii. Report Writing
   iv. Writing for the Media

Note: In classroom instruction it may be ensured that the theoretical and practical components of CSS-II complement the language activity in this semester.

General Telugu Syllabus for B.A/ B.Com/B.Sc., Courses Under CBCS
W.e.f. 2015-16 (Revised in April - 2016)
SEMESTER - III

I. ప్రాచీన కవిత్వం:

(అ) పోతన – వామనావతారం
ఆంధ్రమహాభాగవతం – ఎనిమిదవ స్కంధం (582-621)
("కులమున్ రాజ్యము" నుండి "రవిబింబంబుపమింప" వరకు)

(ఆ) కొఱవిగోపరాజు – శాలివాహన విజయం
సింహాసన ద్వాత్రింశిక – ఒకటవ ఆశ్వాసం (115-165)
("సజ్జన దానధర్మ" నుండి "ఇట్లు విక్రమార్కుడీడ్చిన" వరకు)

II ఆధునిక కవిత్వం

(అ) కునుమ ధర్మన్న – హరిజన శతకము (1-20)
"శ్రీహరినుత నీదు" నుండి "నీకులంబువారు" వరకు

(ఆ) రాయప్రోలు సుబ్బారావు– సంక్రాంతి సంబరము – మిక్రమంజరిలోంచి – "అయిదు లక్షల అరవదేడులు" నుండి "మంగళము సంక్రాంతి సామికి" వరకు

III గద్యభాగం (వ్యాస సంపుటి)

(అ) ఆచార్య గుజ్జర్లమూడి కృపాచారి – తెలుగు భాష

(ఆ) ఆచార్య రాచపాళెం చంద్రశేఖర రెడ్డి– వ్యక్తిత్వ వికాసం

IV ఛందస్సు – అలంకారాలు

(అ) ఛందస్సు – ఉత్పలమాల, చంపకమాల, కార్దూలం, మత్తేభం, కందం, తేటగీతి, ఆటవెలది

(ఆ) అలంకారాలు – ఉపమ, రూపక, ఉత్ప్రేక్ష, స్వభావోక్తి, అతిశయోక్తి, అర్థాంతరన్యాస, దృష్టాంతం, శబ్దాలంకారాలు.

విద్యార్థి కృత్యాలు:

1. తెలుగు వారాలు, తిథులు, నక్షత్రాలు, సంవత్సరాల పేర్లు నేర్చుకోండి.
2. మీ వ్యక్తిత్వాన్ని మీరు ఏ విధంగా మెరుగుపరుచుకుంటున్నారో వ్యాసం రాయండి.
3. అంత్యానుప్రాసాలంకారంలో ఒక కవిత సొంతంగా రాయండి.

YOGI VEMANA UNIVERSITY: KADAPA

PART- 1 (B) HINDI

SEMESTER – III

Common to B.A/B.Com/B.Sc/BBA

Unit	III Sem
1. काव्यदीप (Ancient and Modern Poetry)	कबीरदास – साखी – 1 -10 सूरदास का बालवर्णन मातृभूमि तोडती पत्थर गीत फरोश
2. हिन्दी साहित्य का इतिहास (History of Hindi Literature)	भक्तिकाल ज्ञानाश्रयी शाखा – कबीर प्रेमाश्रयी शाखा - जायसी
3. साधारण निबंध (General Essays)	समाचार पत्र बेकारी की समस्या कम्प्यूटर पर्यावरण और प्रदूषण साहित्य और समाज
4. अनुवाद (Translation)	अनुवाद अभ्यास-अंग्रेजी से हिन्दी (Four or Five lines)
5. पयोजनमूलक हिन्दी (Functional Hindi)	परिपत्र ज्ञापन सूचना

YOGI VEMANA UNIVERSITY: KADAPA

PART- 1 (B) URDU

SEMESTER - III

Common to B.A/B.Com/B.Sc/BBA

Prose and Poetry

UNIT – I Dastan – Mir Amman– Bagh-o-Bahar-Aghaz Khisse ka

UNIT – II Khutoote Ghalib –Banaam Mir Mehdi Majrooh Aur Hatim Ali Mehar

UNIT – III Masnavi – Ibne Nishati – Phoolbun – Aaghaze Dastan - 21 Sher

UNIT – IV Marsiya – Meer Anees – Jab Qata ki masafate shab aaftab ne (Ibtidayi 6 band musaddas ke)

UNIT – V Rubaiyaat

1. Amjad Hyderabadi – ‘ Har cheez ka khona bhi ‘
2. Saghar Jayyedi –‘ Tareef ki meezaan pe tul jate hain

Prescribed Book: MUNTAKHAB ADAB – II

B.A/ B.Com/B.Sc.

Semester - I

Foundation Course-1: Human Values and Professional Ethics

(Common for All UG Programs)

Unit-I : Introduction to Value Education

1. Value Education, Definition, Concept and Need for Value Education
2. The Content and Process of Value Education
3. Self-Exploration as a means of Value Education
4. Happiness and Prosperity as parts of Value Education

Unit-II : Harmony in the Human Being

1. Human Being is more than just the Body
2. Harmony of the Self ('I') with the Body
3. Understanding Myself as Co-existence of the Self and the Body
4. Understanding Needs of the Self and the Needs of the Body

Unit-III : Harmony in the Family and Society and Harmony in the Nature

1. Family as a basic unit of Human Interaction and Values in Relationships
2. The Basics for respect and today's Crisis : Affection, Care, Guidance, Reverence, Glory, Gratitude and Love
3. Comprehensive Human Goal : The Five dimensions of Human Endeavour

Unit-IV : Social Ethics

1. The Basics for Ethical Human conduct
2. Defects in Ethical Human Conduct
3. Holistic Alternative and Universal order
4. Universal Human Order and Ethical Conduct

Unit-V : Professional Ethics

1. Value Based Life and Profession
2. Professional Ethics and Right Understanding
3. Competence in Professional Ethics
4. Issues in Professional Ethics – The Current scenario
5. Vision for Holistic Technologies, Production System and Management Models

References:

1. A.N.Tripaty, Human Values, New Age International Publishers, 2003
2. Bajpai.B.L., Indian Ethos and Modern Management, New Royal Book Co., Lucknow, 2004
3. Bertrand Russell, Human Society in Ethics and Politics
4. Corliss Lamont, Philosophy of Humanism
5. Gaur.R.R., Sangal.R, Bagaria.G.P., A Foundation Course in Value Education, Excel Books.
6. Gaur.R.R., Sangal.R, Bagaria.G.P., Teacher's Manual, Excel Books, 2009
7. I.C.Sharma, Ethical Philosophy of India, Nagin & Co., Julundhar
8. Mortimer.J.Adler, What Man has Made of Man
9. R.Subramanian, Professional Ethics, Oxford University Press
10. Text Book for Intermediate - Ethics and Human Values, Telugu Academy, Hyderabad.
11. William Lilly, Introduction to Ethics, Allied Publisher

Foundation Course-2: Environmental Studies
(Common for All UG Programs)

Unit-I: Natural Resources: 6 Hrs

Definition, Scope and importance. Need for public awareness.

Brief description of;

- Forest recourses: Use and over-exploitation. Deforestation; timber extraction, mining, dams. Effect of deforestation environment and tribal people
- Water resources: Use and over–utilization. Effects of over utilization of surface and ground water. Floods, drought.
- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
- Food resources: World food problems, Effects of modern agriculture; fertilizer- pesticide, salinity problems.
- Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.
- Land resources: Land as resources, land degradation, man induced landslides, soil erosion and desertification

Unit-II : Ecosystems, Biodiversity and its conservation 6 Hrs

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Food chains, food webs and ecological pyramids
- Characteristic features of the following ecosystems:-Forest ecosystem, Desert ecosystem, Aquatic ecosystem.
- Value of biodiversity: Consumptive use, productive use. Biodiversity in India.
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity

Unit-III : Environmental Pollution 6 Hrs

- Definition, Causes, effects and control measures of:- Air pollution, Water pollution, Soil pollution, Noise pollution
- Solid waste management; Measures for safe urban and industrial waste disposal
- Role of individual in prevention of pollution
- Disaster management: Drought, floods and cyclones

Unit-IV: Social Issues and the Environment 6 Hrs

- From Unsustainable to Sustainable development
- Water conservation, rain water harvesting, watershed management.
- Climate change, global warming, ozone layer depletion,
- Environment protection Act
- Wildlife Protection Act, Forest Conservation Act

Unit-V: Human Population and the Environment 6 Hrs

- Population explosion, impact on environment.
- Family welfare Programme
- Environment and human health
- Women and Child Welfare
- Value Education
- Role of Information Technology in Environment and human health.

References:

1. M.Satyanarayana, M.V.R.K.Narasimhacharyulu, G. Rambabu and V.VivekaVardhani, Environmental Studies, Telugu Academy, Hyderabad.
2. R.C.Sharma and Gurbir Sangha, Environmental Studies, Kalyani Publishers.
3. Purnima Smarath, Environmental Studies, Kalyani Publishers.

Semester - II

Foundation Course –3

Information & Communication Technology-I

(Computer Fundamentals and Office Tools) (30 hrs. of Teaching Learning including Lab)

(Common for all UG Programs)

Unit-I: Basics of Computers :Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working – Central Processing Unit – I/O Devices.

Unit-II: Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Pane.

Unit-III: MS-Word

Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge

Unit-IV: MS-PowerPoint

Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures -Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation

Unit-V: MS-Excel

Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns –Changing column widths and row heights, auto format, changing font sizes, colors, shading.

References:

1. ReemaThareja, Fundamentals of Computers, Oxford University Press, India

2. V.Raja Raman, Fundamentals of Computers, Prentice Hall of India.

3. John Walkenbach, Herb Tyson, Michael R.Groh and Faithe Wempen, Microsoft Office 2010 Bible Wiley Publishers

Foundation Course-4

Communication and Soft Skills-1 (Course Content (30 Hours))

(Common for All UG Programs)

Vocabulary is considered the key to communication and it plays a great role for learners in acquiring a language. The first unit, therefore, is on the different aspects of vocabulary.Since English is a predicate-oriented language, there are two units on grammar focusing on the verb phrase. Listening and speaking are the two receptive skills. Listening is the basic skill of communication, and reading helps a person refine their writing skills. Unit IV and Unit V are on listening and reading respectively.

Unit I: Vocabulary Building

1. (a) Prefixes and Suffixes
   (b) Conversion
   (c) Compounding
   (d) Analogy
2. One-Word Substitutes
3. Words Often Confused
4. Synonyms and Antonyms
5. Phrasal Verbs

Unit II: Grammar - 1

1. Types of Verbs
2. Subject-Verb Agreement

Unit III: Grammar - 2

1. Meanings of Modals
2. Tense (Present and Past) and Aspect
3. The Several Possibilities for Denoting Future Time
4. Articles and Prepositions

Unit IV: Listening Skills

1. The Importance of Listening
2. Types of Listening
3. Barriers/Obstacles to Effective Listening
4. Strategies for Effective Listening

Unit V: Reading Skills

1. Skimming
2. Scanning
3. Intensive Reading and Extensive Reading
4. Comprehension

Semester - III

Foundation Course -5

Information & Communication Technology–2

(Internet Fundamentals and Web Tools) (30 hrs. of Teaching Learning including Lab)

(Common for All UG Programs)

Unit-I:Fundamentals of Internet : Networking Concepts, Data Communication – Types of Networking, Internet and its Services, Internet Addressing – Internet Applications – Computer Viruses and its types – Browser –Types of Browsers.

Unit-II: Internet Applications: Using Internet Explorer, Standard Internet Explorer Buttons, Entering a Web Site Address, Searching the Internet – Introduction to Social Networking: Twitter, Tumblr, Linkedin, Facebook, Flickr, Skype, Yelp, Vimeo, Yahoo!, Google+, Youtube, WhatsApp, etc.

Unit-III: E-Mail :Definition of E-mail - Advantages and Disadvantages – User IDs, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management, Email Inner Workings.

Unit IV: WWW- Web Applications, Web Terminologies, Web Browsers, URL – Components of URL, Searching WWW – Search Engines and Examples.

Unit-V: Basic HTML: Basic HTML – Web Terminology – Structure of a HTML Document – HTML, Head and Body tags – Semantic and Syntactic Tags – HR, Heading, Font, Image and Anchor Tags –Different types of Lists using tags – Table Tags, Image formats – Creation of simple HTML Documents.

References:

1. Raymond Green Law and Ellen Hepp, Fundamentals of the Internet and the World Wide Web, TMH Publishers.

Foundation Course - 6

Communication and Soft Skills-2 (Course Content (30 hours))

(Common for All UG Programs)

CSS-2 aims at improving the speaking skills of the learner. For many learners of English, the sound-spelling relationship of the language appears anarchic. Another problem many Indian learners face is English word accent. Unit I and Unit II help learners overcome these problems to a great extent. The remaining units are on the two productive skills, speaking and writing. The techniques of day-to-day conversations and the important characteristics of interviews and GDs presented in this course strengthen the learner's speaking skills. The last unit presents various aspects of presentation in writing.

Unit I: Pronunciation-1

The Sounds of English

Unit II: Pronunciation–2

1. Word Accent
2. Intonation

Unit III: Speaking Skills-1

1. Conversation Skills
2. Interview Skills
3. Presentation Skills
4. Public Speaking

Unit IV: Speaking Skills-2

1. Role Play
2. Debate
3. Group Discussion

Unit V: Writing Skills

1. Spelling
2. Punctuation
3. Information Transfer
    - o Tables
    - o Bar Diagrams
    - o Line Graphs
    - o Pie Diagrams
    - o Flow Charts
    - o Tree Diagrams
    - o Pictures

Semester - IV
Foundation Course -7
Communication and Soft Skills-3 (Course Content (30 hours))
(Common for All UG Programs)

A current axiom is that hard skills will get a person an interview, but soft skills will get that person the job. Unit I of the course is on soft skills, which are absolutely necessary in the global job market. Writing is considered the most difficult of all the skills. Units II to V help the learner improve their writing skills, especially academic/formal writing.

Unit I: Soft Skills

1. Positive Attitude
2. Body Language
3. SWOT/SWOC Analysis
4. Emotional Intelligence
5. Netiquette

Unit II: Paragraph Writing

1. Paragraph Structure
2. Development of Ideas

Unit III: Paraphrasing and Summarizing

1. Elements of Effective Paraphrasing
2. Techniques for Paraphrasing
3. What Makes a Good Summary?
4. Stages of Summarizing

Unit IV: Letter Writing

1. Letter Writing (Formal and Informal)
2. E-correspondence

Unit V:

1. Resume and CV
2. Cover Letter

Foundation Course - 8
Analytical Skills

(Common for All UG Programs) (Total 30 Hrs)

Unit-I : Data Analysis: The data given in a Table, Graph, Bar Diagram, Pie Chart, Venn diagram or a passage is to be analyzed and the questions pertaining to the data are to be answered.

Unit-II: Sequence and Series: Analogies of numbers and alphabets completion of blank spaces following the pattern in A:b::C: d relationship odd thing out; Missing number in a sequence or a series.

Unit-III: Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF). Date, Time and Arrangement Problems: Calendar Problems, Clock Problems, Blood Relationship.

Unit-IV: Quantitative aptitude: Averages, Ration and proportion, Problems on ages, Time-distance – speed.

Unit-V: Business computations: Percentages, Profit &loss, Partnership, simple compound interest.

References:

1. R S Agrawal, Quantitative Aptitude for Competitive Examination, S.Chand publications.
2. R V Praveen, Quantitative Aptitude and Reasoning, PHI publishers.
3. Pratogitaprakasan, Kic X, Quantitative Aptitude: Numerical Ability (Fully Solved) Objective Questions, Kiran Prakasan publishers
4. Abhijit Guha, Quantitative Aptitude for Competitive Examination, TMG Hill publications.
5. Old question Paper of the Exams conducted by (Wipro, TCS, Infosys, etc.) at their recruitment process, source-Internet.

Note: The teachers/students are expected to teach /learn the contents by not converting them to the problems of algebra at the maximum possible extent, but to use analytical thinking to solve the exercises related to those topics. This is the main aim of the course.

Foundation Course-9
Entrepreneurship Education
(Common for All UG Programs) (Total 30 Hrs)

Unit-I: Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III: Project Formulation and Appraisal : Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques –economic – Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.

Unit-iv: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC- SSIDC- Other financial assistance.

Unit-V: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

References:

1. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
2. Poornima M.CH., Entrepreneurship Development–Small Business Enterprises, Pearson, 2009
3. Michael H. Morris, et. al., Entrepreneurship and Innovation, Cengage Learning, New Delhi, 2011
4. KanishkaBedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009
5. Anil Kumar, S., et.al., Entrepreneurship Development, New Age Publishers, New Delhi, 2011
6. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi.
7. Peter F. Drucker, Innovation and Entrepreneurship.
8. A.Sahay, M. S. Chikara, New Vistas of Entrepreneurship: Challenges and Opportunities.

Foundation Course-10
Leadership Education

(Common for All UG Programs) (Total 30 Hrs)

1. Organisation – Management – Leadership –Meaning and Significance – Different theories – Trait Theory, Blake & Mountan Theory – Other functions of Management.

2. Behavioral Concepts – Individual Behaviour – Perception – Learning – Attitude Formation and Change – Motivation – Theories of Motivation – Personality Development.

3. Interpersonal Behaviour – Communication – Leadership – Influencing Relations – Transactional Analysis.

4. Group Dynamics – Roles – Morale – Conflict – Groups – Inter-Group Behaviour – Inter- Group Collaboration and Conflict Management.

5. Team Building and Management – Developing team resources – Designing team – Participation and Repercussion – Team building activities.

References:

1. Fred Luthans, “Organizational Behaviour”, Tata McGraw Hill Publishing Co., New Delhi.
2. Robins, Stephen P, “Organizational Behaviour”, Prentice Hall of India, New Delhi.
3. Koontz and O “Donnell”, Essentials of Management, TMH Publishing Co., New Delhi.
4. Keith Davis, “Human Behaviour at Work”, Tata McGraw Hill Publishing Co., New Delhi.
5. Aswathappa,”Orgnizational Behaviour”, Himalaya Publishing House, Mumbai
6. Stoner Freeman, “Management”, Prentice Hall of India, New Delhi.

YOGI VEMANA UNIVERSITY : KADAPA

BA Economics Syllabus under CBCS

B. A. ECONOMICS

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – III

Paper – III (Core Paper)

Macro Economics - National Income, Employment and Money

Module - 1

Meaning, definition of Macro Economics - Importance of Macro Economics- Difference between Micro and Macro Economics - Paradox of Macro Economics -Limitations

Module - 2

National Income - Definitions, Concepts of National Income - Measurement of National Income- Circular flow of Income in Two, Three and Four Sector Economy.

Module - 3

Classical theory of Employment - Say's Law of Markets.

Module - 4

Keynesian Theory of Employment - Consumption function – Investment Function - Marginal Efficiency of Capital (MEC)- Concepts of multiplier and accelerator

Module - 5

Meaning and Functions of Money - Classification of money - Gresham's Law - RBI classification of Money. Theories of Money - Fisher's Quantity theory of Money Cambridge approach (Marshall, Pigou, Robertson & Keynes).

REFERENCES:

1. G.Ackley - "Macro Economics Theory and Policy", Collier Macmillan, 1978.
2. E.Shapiro - "Macro Economic Analysis", Galgotia Publications, 1999.
3. Central Statistical Organisations - "National Accounts Statistics".
4. R.Dornbush, s.Fisher and R.Startz - "Macro Economics", Tata Mc.Graw Hill, 9/e, 2004.
5. M.L.Seth-"Macro Economics", Lakshmi Narayana Agarwal, 2015.
6. K.P.M. Sundaram - "Money, banking & International Trade", Sultan Chand, 2010.
7. Dillard, D - "The Economics of John Maynard Keynes", Crossby Lockwood & Sons.
8. M.N.Mish ra & S.B.Mishra - "Insurance Principles & Practice" S.Chand 2012.
9. Bharati V.Pathak "The Indian Financial System Markets. Institutions & Services". Pearson 2008.
10. Telugu Academy Publication

B. A. ECONOMICS

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – IV

Paper – IV (Core Paper)

Banking and International Trade

Module - 1

Trade Cycles - meaning and definition - Phases of a Trade Cycle -Inflation - definition - types of inflation - causes and effects of inflation measures to control inflation.

Module - 2

Banking: Meaning and definition -Functions of Commercial Banks - Concept of Credit creation-Functions of RBI - Recent developments in banking sectors.

Module – 3

Non-Bank Financial Institutions – Types of NBFIs - Factors contributing to the Growth of NBFIs –-Money market – Defects of Indian money market

Module – 4

Concepts of Shares-Debentures - Stock Market - Functions - Primary and Secondary Markets - SEBI - - Insurance - Life Insurance and General Insurance.

Module - 5

Macro Economic Policy - Fiscal, Monetary and Exchange rate policies
Objectives and Significance - Importance of International Trade - Regional and International Trade – Defining Balance of Trade and Balance of Payment.

REFERENCES:

1. G.Ackley - "Macro Economics Theory and Policy", Collier Macmillan, 1978.
2. E.Shapiro - "Macro Economic Analysis", Galgotia Publications, 1999.
3. Central Statistical Organisations - "National Accounts Statistics".
4. R.Dornbush, s.Fisher and R.Startz - "Macro Economics", Tata Mc.Graw Hill, 9/e,2004.
5. M.L.Seth-"Macro Economics", Lakshmi Narayana Agarwal, 2015.
6. K.P.M. Sundaram - "Money, banking & International Trade", Sultan Chand, 2010.
7. Dillard, D - "The Economics of John Maynard Keynes", Crossby Lockwood & Sons.
8. M.N.Mish ra & S.B.Mishra - "Insurance Principles & Practice" S.Chand 2012.
9. Bharati V.Pathak "The Indian Financial System Markets. Institutions & Services".
10. Pearson.
11. D.M.Mithani & G.K.Murty - “Business Economics", Himalaya Publishing House, 2015.
12. M.L.Jhingan - Economic Development - Vikas, 2012.
13. G.Omkarnath - Economics - A Primer for India - Orient Blackswan, 2012.
14. Agarwal, V. (2010) Macroeconomics: theory and Policy, Dorling Kindersley (India)
15. Pvt. Ltd., New Delhi

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – V (Core Paper)

Paper V : CONTEMPORARY INDIAN ECONOMY

Module-I :

Characteristics of India as a developing Economy- Demographic Features of India- Population Dividend- Occupational Structure in India- Trends in the growth of India's National Income.

Module-II :

Tax Reforms and GST- tax Revenue and its devolution to states – Public Debt Redemption Methods- Brief outline of Globalization and its impact on Indian Economy.

Module-III :

Magnitude of poverty in India- Unemployment and its dimensions- Major schemes of rural and urban development- Objectives and achievements of Planning in India- Balanced Regional Development- NITI Ayog.

Module- IV:

Indian Agriculture- Importance of agriculture in India –Factors determining agriculture productivity- Land use and Cropping Pattern in India- Agriculture Infrastructure- Rural Credit- Micro Finance- Self Help Groups- Agriculture price policy- Agriculture Insurance- Food Security.

Module-V:

Industrial polices, 1956, 1991 – Growth and problems of small scale industries in India -Make In India -Foreign direct Investment. Foreign Exchange Management Act (FEMA)- SEZs- Disinvestment Policy in India- Growing importance of Service Sector in India – Banking, Insurance, IT, Education and health.

References:

1. Dhingra I.C., Indian Economy, Sultan Chand, 2014
2. Ruddar Dutt and K.P.M. Sundaram- Indian Economy, Sultan Chand,2015
3. S.K. Misra & V.K. Puri-Indian Economy, Himalaya Publishing House, 2015
4. G.Omkarnath-Economics- A Premier of India, Orient Blacksman, 2012
5. Telugu Academy Publications
6. Dr. S.G.K. Murthy, Indian Economy – Gitam University

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – VI (Core Paper)

PAPER VI : QUANTITATIVE TECHNIQUES

(Mathematical derivations and proofs are not required. Only applications)

Quantitative Methods

Unit-I: Introduction: Meaning- Definition- Function- Importance and Limitations of Statistics. Collection of Data- Primary and Secondary Data- Schedule and Questionnaire- Diagram and Graphic Presentation of Data (One dimensional and frequency curves).

Unit:II: Measures of Central Tendency: Definition, Objectives and Characteristics of Measures of Central Tendency- Types of Averages- Arithmetic Mean, Geometric Mean, Harmonic Mean- Mean- Mode- Properties of Averages.

Unit-III: Measures of Dispersion: Definition, Objectives of Dispersion- Range- Quartile Deviation- Mean Deviation- Standard Deviation- Coefficient of variation.

Unit-IV: Measures of correlation and Regression : Meaning, Definition and Uses of correlation- Types of Correlation- Karl Pearson's Correlation Coefficient- Spearman's Rank Correlation- Probable Error- Meaning. Utility of Regression Analysis- comparison between Correlation and Regression.

Unit V: Matrix: Definition- Examples- types of Matrices- matrix Addition- Multiplication- Determinant of Matrices- Minors- Co-Factors- Inverse of a Matrix.

REFERENCES:

1. Sivayya K.V. and Satya rao, Business Mathematics, Sarathi Publication, Guntur.
2. Sancheti and Kapoor V.K., Business Mathematics, Sulthan Chand & Sons, New Delhi.
3. D N Elhance, Fundamentals of Statistics, Kithab Mahal, Allahabad.
4. Gupta SC, Fundamentals of Business Statistics, Sulthan Chand & Sons, New Delhi.
5. Aggarwal, Business Statistics, Kalyani Publishers Hyderabad.
6. Reddy CR, Business Statistics, Deep & Deep Publications.
7. S.P. Gupta & V.K. Kapoor, Fundamentals of mathematical Statistics, S. Chand and Co, 2014

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper VII -- AGRICUTURAL ECONOMICS

Module-1

Nature and Scope of Agricultural Economics. Factors affecting agricultural development: technological, institutional and general. Interdependence between agriculture and industry.

Module-2

Concept of production function : input-output and product relationship in farm production.

Module-3

Growth and productivity trends in Indian agriculture with special reference to Andhra Pradesh. Agrarian reforms and their role in economic development.

Module-4

Systems of farming, farm size and productivity relationship in Indian agriculture with special reference to Andhra Pradesh- New agriculture strategy and Green revolution : and its Impact

Module-5

Emerging trends in production, processing, marketing and exports; policy controls and regulations relating to industrial sector with specific reference to agro-industries in agri-business enterprises.

RECOMMENDED / REFERENCE BOOKS

1. Sadhu An, Singh Amarjit and Singh Jasbir (2014), Fundamentals of Agricultural Economics, Himalaya Publishing House, Delhi
2. Lekhi RK and Singh Joginder, Agriculatural Economics, Kalyani Publishers
3. Bhaduri, A. (1984), The Economic Structure of Backward Agriculture, Macmillan, Delhi.
4. Bilgrami, S.A.R. (1996), Agricultural Economics, Himalayas publishing house, Delhi.

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A1 - Agribusiness Environment in Andhra Pradesh

Module-1

Role of agriculture in development process in Andhra Pradesh vis-à-vis other developed states. Economy wide effects of agriculture in Andhra pradesh through trickle down effects. Backward and forward linkages of agriculture with rest of economy.

Module-2

Agricultural finance-importance in modern agriculture- performance of agricultural finance in Andhra Pradesh -problems of agricultural finance – Inter linkages of agricultural credit and other input markets and product markets.

Module-3

Dynamics of agriculture-crop (horticulture, field crops), sector-livestock (poultry dairy and fisheries) sector and inter linkages among the sectors. Agribusiness sector in Andhra Pradesh-salient futures, constraints, sub sectors of agribusiness-input sector, production sector, processing sector.

Module-4

Growth performance of major agricultural commodities in Andhra Pradesh-production and processing trends in exports and imports of major agricultural commodities.

Module-5

Marketing policy- structure of agri markets – regulated markets – need – activities – structure – APMC act – market legislations – Role of Farmer Groups in the marketing of Agricultural Produce.

References:

1. Adhikary M. 1986. Economic Environment of Business. S. Chand & Sons.
2. Aswathappa K. 1997. Essentials of Business Environment. Himalaya Publ.
3. Francis Cherunilam 2003. Business Environment. Himalaya Publ.

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A2 - Agricultural output Marketing

Module-1

Structure and Model of Agri-Marketing Organizations with functions: Functions of intermediaries, Marketing Practices in Primary and secondary and terminal market, Regulated markets, co-operative marketing.

Module-2

Marketing costs and margins, Marketing Finance. Marketing Structure of Major agricultural commodities, food grains: Rice, and Maize. Cash Crops; Cotton, Oil Seeds, Vegetables and Fruits, Milk, Meat and Poultry products.

Module-3:

Problems and Challenges in Agriculture Marketing - Market Yards - Support prices - Rural Warehousing.

Module-4:

State Intervention in Agricultural Marketing, Role of Various agencies (Andhra Pradesh Agro, MARKEED, State Department, and FCI, Tobacco Board, Cotton Corporation) and its impact on market efficiency. Agriculture Price Commission.

Module-5:

Inter-regional and international trade in agriculture; emerging scenario of international trade in agricultural commodities; concept of terms of trade and balance of payments,. WTO and Indian agriculture with special reference to Andhra Pradesh .

References:

1. C.S.G.Krishnamacharyulu & Lalitha Ramakrishnan, "Rural Marketing: Text and Cases", Pearson Education, New Delhi.
2. Awadhesh Kumar Singh & Satyaprakash Pandey, Rural Marketing: Indian Perspective, New Age International Publishers, New Delhi.
3. Mamoria, C.B. & Badri Vishal: Agriculture Problems in India

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A3 - Agricultural Input Marketing

Module-1

Agri input marketing – Meaning and importance – distinctive features of Agri. Input marketing – Distribution channels of agri. Inputs – Private, Government, Co-operative and Joint sector. Agri inputs promotional programme – concepts and techniques.

Module-2

.

Issues in seed marketing – determinants of seed demand – private sector contribution – public sector support to private sector - Distinctive features of Seed Marketing vis – a – vis other Input Marketing – strengths and weaknesses on Indian seed industry.

Module-3

Fertilizer industry scenario – public, private, co-operative and joint sector role – fertilizer production consumption, and imports – fertilizer marketing characteristics. Biofertilizers – its role and scope – major constraints involved – production level – market level – field level. Marketing network/ channels.

Module-4

Pesticide industry – an overview – nature of industry growth – consumption crop wise, area wise – demand and supply – market segmentation.-IPM concept development – biopesticides – its role and scope.

Module-5

Agricultural mechanization – benefits and importance and future priorities – scenario of farm implements and machinery sector – economic advantage of mechanization – contribution of agricultural mechanization – Need for the development of agricultural machinery and implements to suit the local resource endowments.

References:

1. Acharya SS & Agarwal NL 2004, Agricultural Marketing in India – Oxford & IBH.

YOGI VEMENA UNIVERSITY: KADAPA

Structure of B. A. HISTORY Syllabus under CBCS

B. A. HISTORY

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – III

Paper – III (Core Paper)

LATE MEDIEVAL & COLONIAL HISTORY OF INDIA (1526 to 1857 A. D.)

(History and Culture of India (1526 – 1857))

Unit – 1	India from 1526 to 1707 A. D.: Emergence of Mughal Empire - Sources, Conditions in India on the eve of Babur's invasion, Brief Summary of Mughal Polity – Sher Shah & Sur Interregnum – Expansion & Consolidation of Mughal Empire – Rise of Marathas &Peshwas.
Unit – II	Administration, Economy, Society and Cultural Developments under the Mughals – Disintegration of Mughal Empire.
Unit - III	India under Colonial Hegemony : Beginning of European Settlements – Anglo-French Struggle – Policies of Expansion - Subsidiary Alliance & Doctrine of Lapse - Consolidation of British Empire in India up to 1857 A. D.
Unit - IV	Economic Policies of the British (1757-1857): Land Revenue Settlements – Commercialization of Agriculture – Impact of Industrial Revolution on Indian Industry ; Administration of the Company – Regulating Charter Acts; Cultural & Social Policies: Humanitarian Measures & Spread of Modern Education
Unit – V	Anti-Colonial Upsurge –Peasant & Tribal Revolts - 1857 Revolt – Causes, Nature& Consequences.

References:

1	Bipan Chandra, Modern India
2	Bipan Chandra, Rise and Growth of Economic Nationalism in India
3	C.A.Bayly, Indian Society and the Making of the British Empire
4	HarbansMukhia, The Mughals of India
5	Irfan Habib, Medieval India: The study of a Civilization
6	L.P.Sharma, The Mughal Empire
7	R.P.Dutt, India Today
8	Sathis Chandra, Essays on Medieval Indian History

B. A. HISTORY

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – IV

Paper – IV (Core Paper)

SOCIAL REFORM MOVEMENT & FREEDOM STRUGGLE (1820 to 1947 A.D.)

(History and Culture of India (1857 – 1947))

Unit – 1	Social, Religious & Self-Respect Movements: Social & Cultural Awakening – Brahma Samaj, Arya Samaj, Theosophical Society, Ramakrishna Mission, Aligarh Movement – Emancipation of Women – Struggle Against Caste: JyotibaPhule, Narayana Guru, Periyar, Dr. B. R. Ambedkar.
Unit – II	Growth of Nationalism in the 2nd Half of 19th Century – Impact of British Colonial Policies under Viceroys' Rule and the Genesis of Freedom Movement – Birth of Indian National Congress.
Unit - III	Freedom Struggle from 1885 to 1920: Moderate Phase — Partition of Bengal - Emergence of Militant Nationalism –Swadeshi & Boycott Movement – Home Rule Movement.
Unit - IV	Freedom Struggle from 1920 to 1947: Gandhiji's Role in the National Movement – Revolutionary Movement –Subhas Chandra Bose.
Unit – V	Muslim League & the Growth of Communalism – Partition of India – Advent of Freedom - Integration of Princely States into Indian Union – SardarVallabhai Patel.

References:

1	Anil Seal, Emergence of Indian Nationalism
2	Banerjee, Sekhar, From Plassey to Partition
3	Bayly, C A., Indian Society and Making of the British Empire
4	Brown, Judith: Gandhi's Rise to Power
5	Chandra, Bipan, et. al., India's Struggle for Independence
6	Chatterjee, Jaya, Bengal Divided: Hindu Communalism and Partition 1932-1947

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – V (Core Paper)_____ **AGE OF RATIONALISM AND HUMANISM THE WORLD BETWEEN 15TH & 18TH CENTURIES**

(History of Modern World (1453 – 1821 A.D))

Unit – 1	Feudalism -Geographical Discoveries: Causes – Compass & Maps – Portugal Leads and Western World Follows – Consequences;
Unit – II	The Renaissance Movement: Factors for the Growth of Renaissance – Characteristic Features - Transformation from Medieval to Modern World; Reformation & Counter Reformation Movements: The Background – Protestantism – Spread of the Movement– Counter Reformation– Effects of Reformation
Unit - III	Emergence of Nation States: Contributory Factors - England and other Nation States – Impact due to the Emergence of Nation States.;Age of Revolutions: The Glorious Revolution (1688) – Origin of Parliament – Constitutional Settlement – Bill of Rights – Results.
Unit - IV	Age of Revolutions: The American Revolution (1776) – Opening of New World – Causes – Course – Declaration of Independence, 1776 – Bill of Rights, 1791 – Significance.
Unit – V	Age of Revolutions: The French Revolution (1789) – Causes - Teachings of Philosophers - Course of the Revolution – Results.

References:

1	Burke, Peter, The Renaissance
2	C.J.H. Hayes, Modern Europe up to 1870

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – VI (Core Paper) **HISTORY**

& CULTURE OF ANDHRA DESA (from 12th to 19th Century A.D.) ***(History and Culture of Andhra from Satavahanas to 1857 A.D)***

Unit – 1	Andhra during 12th& 13th Centuries A.D.: Kakatiyas – Origin & its Antecedents – Administration – Social & Economic Life – Industries & Trade - Promotion of Literature and Culture – Architecture & Sculpture – Decline; The Age of Reddy Kingdoms: Patronage to Literature – Trade & Commerce.
Unit – II	Andhra between 14th & 16th Centuries A.D.: Vijayanagara Empire: Polity, Administration, Society & Economy – Sri Krishna Devaraya and his contribution to Andhra Culture – Development of Literature & Architecture – Decline and Downfall.
Unit - III	Andhra through 16th& 17th Centuries A.D.: Evolution of Composite Culture - The QutbShahis of Golkonda – Origin & Decline – Administration, Society & Economy – Literature & Architecture.
Unit - IV	The 18th& 19th Centuries in Andhra: East India Company's Authority over Andhra – Three Carnatic Wars – Occupation of Northern Circars and Ceeded Districts –Early Uprisings – Peasants and Tribal Revolts.
Unit – V	The 18th& 19th Centuries in Andhra: Impact of Company Rule on Andhra – Administration – Land Revenue Settlements – Society – Education - Religion – Impact of Industrial Revolution on Economy – Peasantry & Famines – Contribution of Sir Thomas Munroe, C. P. Brown & Sir Arthur Cotton – Impact of 1857 Revolt in Andhra

1	BalenduSekharam, The Andhras Through the Ages
2	K. Sathyanarayana, A Study of the History and Culture of Andhras
3	Mallampalli Soma SekharaSarma, History of the ReddiKindogms
4	K.A.N.Sastry, A History of South India
5	H.K.Sherwani, History of the KutubShahi Dynasty
6	P.R.Rao, History of Modern Andhra
7	KhandavalliLakxmiranjanam&BalenduSekharam, □□□□□□□□□– □□□□□□□
8	SuravaramPratap Reddy, □□□□□□□□□□□□□□□□
9	B.S.L.Hanumanta Rao, □□□□□□□□□
10	I.K.Sarma, *Early Historic Andhra Pradesh,500 B.C.-624 A.D.,* New Delhi, 2008
11	B. Rajendra Prasad, *Early Medieval Andhra Pradesh, A.D.624 -1000 A.D.,* New Delhi, 2009
12	C. Somasundara Rao, *Medieval Andhra Pradesh, A.D. 1000 -1324 A.D.,* New Delhi, 2011
13	R. Soma Reddy, *Late Medieval Andhra Pradesh, A.D. 1324-1724 A.D.,* New Delhi, 2014

Project Work: Students may be asked to identify families/ areas/ institutions/ personalities/ monuments related to freedom struggle and prepare dissertation under the guidance of a teacher so as to equip them with better understanding of society and historical processes. This exercise should also aim at exposing the spirit of research, analysis, criticism, innovation and invention among the students.

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VII

HISTORY OF MODERN EUROPE (from 19th Century to 1945 A.D.)

(History of Modern World (1821 – 1945))

Unit – 1	Industrial Revolution: Origin, Nature and Impact.
Unit – II	Unification Movements in Italy & Germany and their Impact.
Unit - III	Communist Revolution in Russia – Causes, Course and Results – Impact on World Order.
Unit - IV	World War I: Age of Rivalry in Europe Between 1870 and 1914 – Results of the War – Paris Peace Conference - League of Nations.
Unit – V	World War II: Causes, Fascism & Nazism – Results; The United Nations Organization: Structure, Functions and Challenges.

References:

1	J.A.Hobson, Imperialism: A Study
2	C.D. Hazen, Modern Europe up to 1945
3	H.A.L.Fisher, History of Europe
4	C.M.M.Ketelbey, A History of Modern Times
5	Grant and Temperley (ed), Europe in the 18th and 20th Centuries
6	David Thomson, Europe Since Napoleon
7	A.P.J.Taylor, The Struggle for Mastery in Europe
8	S.P.Nanda, History of Modern World
9	S.N.Dhar, International Relations and World Politics Since 1919

Project Work: Project work on the consequences of industrialization & globalization on society and economy should be given to students.

HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A-1 (Cluster Elective Paper –1)

CULTURAL TOURISM IN ANDHRA PRADESH

Unit – 1	Concepts of Tourism: Nature – Scope – Definition – Tourists & Excursionists – Domestic & International Tourists.
Unit – II	Types of Tourism: Heritage Tourism – Pilgrimage Tourism - Recreation Tourism – Sports & Adventure Tourism - Advance Tourism – Health Tourism – Environment Tourism.
Unit - III	History and Tourism – Heritage Sites – Definition – Ancient Monuments Preservation Act of 1904, Act of 1958 and Act of 1972 - Archaeological Survey of India – Stage Museums.
Unit - IV	Planning and Development of A.P. Tourism: APTDC – Aims & Objectives – Fairs & Festivals – Andhra Cuisine –Restaurants - Eco Tourism – Beaches & Hill Resorts – Mountaineering – Tourist Places in A.P.
Unit – V	Modalities of Conducting Tourism: Field Work - Visit to a Site – Conduct of
	Research – Preparation of Project Report

References:

1	APTDC Publications
2	Ashorth G.J, Marketing in Tourism Industry
3	Bhatia A.K., Tourism Development
4	Clare, Gunn, Tourism Planning
5	Khan, Nafees A, Development Tourism in India
6	Krishna K Karama, Basics of Tourism
7	Marrison A.M, Hospitality and Travel Marketing
8	RangaMukesh, Tourism Potential in India
9	Sarkar H, Museums and Protection of Monuments and Antiquities in India
10	Vijayalaxmi K.S., History of Tourism

Field Trip: Compulsory field trip to destinations of architectural, archaeological, historical and cultural importance is to be conducted. Students should be made to prepare detailed reports on the hand-on experience they gained in such trips.

Students should be encouraged to create **blogs** for local site seeing places and to write and organize articles on those spots.

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A-2 (Cluster Elective Paper 2) POPULAR MOVEMENTS IN ANDHRA DESA (1848 TO 1956 A.D.)

(History and Culture of Andhra from 1857 to 2014)

Unit – 1	Social & Self Respect Movements: Social Conditions –KandukuriVeeresalingam, Raghupathi Venkata Rathnam Naidu, GuruzadaApparao, Komarraju Venkata Laxmana Rao; New Literary Movements: Causes – RayaproluSubbarao, ViswanathaSathyanarayana, GurramJashua, BoyiBheemanna, SriSri – Impact.
Unit – II	Freedom Movement in Andhra (1885-1920): Contributory Factors – Vandemataram Movement – Swadeshi & Boycott programs – Glorious Events at Rajahmundry, Kakinada, Kotappakonda& Tenali – Home Rule Movement in Andhra.
Unit - III	Freedom Movement in Andhra (1920-1947): Non-Cooperation Movement – ChiralaPerala, Palanadu&Pedanandipadu Activities – Alluri Seetarama Raju &Rampa Revolt (1922-24) – Anti-Simon Commission Movement – Civil Disobedience Movement – Quit India Movement.
Unit - IV	Movement for Separate Andhra State (1953): Causes – Andhra Maha Sabha – Andhra Provincial Congress Committee – Andhra University – Conflict between Coastal Andhra &Rayalaseema – Sri Bagh Pact – Constitution of Committees & their Contribution – Martyrdom of PottiSriramulu – Formation of separate Andhra State.
Unit – V	Movement for formation of Andhra Pradesh (1956): VisalandhraMahasabha – Role of Communists – States Reorganization Committee – Gentlemen's Agreement – Formation of Andhra Pradesh.

References:

1	B. Kesava Narayana, Political and Social Factors in Modern Andhra
2	K.V.Narayana Rao, The Emergence of Andhra Pradesh
3	M. Venkata Rangaiah, The Freedom Struggle in Andhra Pradesh
4	P.R.Rao, History of Modern Andhra
5	SarojiniRegani, Highlights of Freedom Movement
6	SarojiniRegani, □□□□ □□□□□□□□□□□ □□□□
7	V. Ramakrishna, Social Reform Movement in Andhra
8	B. Kesava Narayana, Modern Andhra & Hyderabad – 1858 – 1956 A.D., 2016

Project Work: With the aim of understanding of techniques and methods of research and presentation, students should be encouraged to draft a report on local writers, struggles, human rights movements, different types of social discrimination etc.

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A-3 (Cluster Elective Paper – 3) COMTEMPORARY HISTORY OF ANDHRA PRADESH (1956-2014)

Unit – 1	Socio-Economic Changes in Andhra Pradesh – River Projects & Infrastructural Development – Education & Scientific Progress – Regional Politics – Emergence of Telugu Desam Party.
Unit – II	Growth of Leftist Ideology – Marxist & Radical Literature – Naxalbary Movement - Communist Activities - Electoral Politics – Present Status of Communist Movement.
Unit - III	Dalit Movement – Understanding Untouchability - Education – Literature - Struggle for Identity – Demand for Political Space.
Unit - IV	Early trends towards Bifurcation: Jai Telengana Movement (1969) – Mulki Rules – Legal Battle - Jai Andhra Movement (1972) – Six Point Formula (1973).
Unit – V	Bifurcation of Andhra Pradesh: Power Politics – Economic Discontentment – Riparian Disputes - Unemployment –Foundation of Telangana RastraSamiti – Movements for separate Telangana & unified Andhra Pradesh – Formation of Telangana State (2014)

References:

1	Barry Pavier, The Telangana Movement - 1944-51
2	Chinnayya Suri, Agrarian Movement in Andhra, 1921-71
3	K. Ramachandra Murthy, Unveiling Telangana State
4	P.R.Rao, History of Modern Andhra
5	S. Ratnakar, A Brief History of Telangana & Andhra Pradesh
6	Sri Krishna Committee Report
7	TarimelaNagireddy, India Mortgaged
8	Y.V.Krishna Rao, Growth of Capitalism in Indian Agriculture: A Case Study of A.P.
9	KattiPadmarao, □□□□□□ □
10	Y. Chinnarao, □□□□ □□□□ □□□□
11	News Paper Clippings (2001-2014)

Project Work: Students may be asked to prepare assignments on local caste struggles; regional disparities; aspirations; recent developments etc., through interviews and verifying press reports.

YOGI VEMANA UNIVERSITY : KADAPA

Structure of BA - Political Science under CBCS

SECOND YEAR; SEMESTER – III
B.A. POLITICAL SCIENCE
PAPER-III : INDIAN CONSTITUTION

Unit-1: The Making of the Constitution

1. The ideological legacy of the Indian National Movement on the Constituent Assembly
2. The Nature and Composition of the Constituent Assembly

Unit-2: Philosophical Premises of the Indian Constitution

1. Preamble: The underlying values of the Indian Constitution
2. Salient features of the Constitution of India

Unit-3: Fundamental rights and Directive principles of State Policy

1. Individual and Collective Rights: Limitations on the fundamental Rights
2. Judicial Interpretation of Fundamental Rights
3. The doctrine of 'Basic Structure' of the Constitution: KesavanandaBharathi Case

Unit-4: Indian Federalism

1. Unitary and Federal features in the Indian Constitution
2. Tension Areas between the Union and State Governments

   Legislative, Administrative and Financial Spheres

Unit-5: Working of the Indian Constitution

1. The Values of the Indian Constitution and Ushering of Social Revolution in India

2. The causes for the Ascendency of the Executive over legislature and Judiciary; Major Controversies regarding the Amendments to the Constitution
3. Nature and Role of Higher Judiciary in India; Recent Debates on the mode of appointment of Judges

Reference books:

1. Granville Austin (1972) the Indian Constitution, Cornerstone of a Nation Oxford university

Press, New Delhi.

2. Madhavkhosla (2012) the Indian Constitution, oxford university press, New Delhi
3. Granville Austin (1999) Working a Democratic Constitution; A History of the Indian

   Experience, Oxford University Press, New Delhi
4. Zoya Hasan, Sridharan E and Sudharshan R (Eds) 2002 India's living Constitution, Permanent black, New Delhi
5. BaxiUpendra (1980) the Indian Supreme Court and Politics Eastern book co, Lucknow

SECOND YEAR; SEMESTER – IV
B.A. POLITICAL SCIENCE
PAPER-IV : INDIAN POLITICAL PROCESS

Unit-1: Approaches to Study the Political Processes in India

1. Theory of Modernization: Transition from Tradition to Modernity
2. Marxian Approach: Transition from pre-capitalism to capitalism

Unit-2: Social Structure and Democratic Process

1. Transition of Caste System: From Hierarchy to Identity: Role of Agency
2. Politicisation of Intermediate and Dalit Caste Communities
3. Evolution of Modernity in India

Unit-3: Religion and Politics

1. Competing Communalisms: Majoritarian and Minoritarian
2. Debates on Secularism; Role of the State towards religion

Unit-4: Party and Electoral Processes in India

1. Electoral Trends of the lokSabha from 1952 to 2014:From the One Party Congress System to Multi Party Coalitions
2. Determinants of Voting Behavior in India;Caste,Class,Patronage, Money etc.

3. Evolution of Party System in India: the Ideology and Social bases of major Political Parties: INC,BJP,CPM, DMK,BSP,TDP

Reference books:

1. Chandhoke N and Priyadarshini P (Eds) (2009) Contemporary India Economy, society, politics, Pearson, NewDelhi.
2. Vanaik A and Bhargava R (Eds) (2010) Understanding Contemporary India Critical perspectives orient black swan New Delhi.
3. Jayal N G and Mehta PB (Eds) (2010) Oxford Companion to Indian Politics Oxford University Press, New Delhi.
4. Kohliatul and Prema Singh (Ed) (2013) Routledge Hand book of Indian Politics Routledge, NewYork.
5. Jaffrelot C (2003) India's Silent Revolution: The Rise of the Lower Caste in North India, C Hrust, London.
6. Stanely A. Kochanek, Robert L.Hardgrave, India Government and Politics in a Developing Nation, Boston, Wards Worth Publishing, 2006.
7. Rajeev Bhargava (Ed) Secularism and its Critics (1998), Delhi, OUP.

THIRD YEAR; SEMESTER – V
B.A. POLITICAL SCIENCE
PAPER-V : INDIAN POLITICAL THOUGHT

Unit-1: Traditions of Ancient Indian Political Thought

1. Sources and features of Ancient Indian Political Thought
2. Manu: Social laws
3. Kautilya:Theory of the State

Unit-2: Renaissance Thought

1. Rammohun Roy: Religious and Social Reform
2. PanditaRamabai: Gender

Unit-3: Early Nationalism

1. DadabaiNaoroji: Drain Theory and Poverty
2. Ranade M G : The Role of the State and Religious Reform

Unit-4: Religious Nationalism

1. Savarkar V D : Hindutva or Hindu Cultural Nationalism
2. Mohammed Iqbal: Islamic Communitarian Nationalism

Unit-5: Democratic Egalitarianism

1. Gandhi-Swaraj and Satyagraha
2. Jawaharlal Nehru- Democratic Socialism
3. Dr.Ambedkar B R – Annihilation of Caste System
4. M.N.Roy: Radical Humanism

Reference books:

1. Pantham Thomas and Kenneth Deutsch(Ed)(1986)

   Political thought in modern India, Sage, New Delhi
2. BidyutChakrabarthy and Rajendra Kumar Pandey (2009) modern Indian political thought, Sage, New Delhi
3. Gurpreet Mahajan (2013), India : Political ideas and making of a democratic discourse, zed book, London
4. Partha Chatterjee (1986) nationalist thought and the colonial world: A derivative disclosure, zed books, London
5. Bhikhu Parekh (1999) colonialism, tradition and reform,Sage,New Delhi
6. Bhikhu Parekh(1989) Gandhi's political philosophy ,Macmillan, London

THIRD YEAR; SEMESTER – V
B.A. POLITICAL SCIENCE
PAPER-VI : WESTERN POLITICAL THOUGHT

Unit-1: Classical Western Political Thought

1. Plato: Theory of Forms, Critique of Democracy, Justice
2. Aristotle: Citizenship, State, Justice, Virtue

Unit-2: Early Medieval to the Beginning of Modern Thought

1. St. Augustine: Earthly City and Heavenly City, Evil, Freewill, Moral Action
2. Machiavelli, Statecraft, Virtue, Fortuna

Unit-3: Liberal Thought

1. Thomas Hobbes: Human nature, Social Contract, liberty, State
2. John Locke: Natural Rights, Consent, Social Contract, State
3. Rousseau: Social institutions and Moral Man, Equality, liberty and General Will

Unit-4: Liberal Democratic Thought

1. Jeremy Bentham: Utilitarianism
2. John Stuart Mill: Individual liberty, Representative Government

Unit-5: Philosophical Idealism and its critique

1. Hegel: Individual Freedom, Civil Society, State
2. Karl Marx: Alienation, Surplus Value,Materialist Conception of History, State

Reference books

1. ShefaliJha (2010) Western Political Thought from Plato to Karl Marx, Pearson, NewDelhi
2. Boucher D and Kelly P (Eds) (2009) Political Thinkers from Socrates to the Present, Oxford University press, oxford
3.Coleman J (2000) A History of Modern Political Thought: From Ancient Greece to early Christianity, Blackwell publishers, oxford
4.Macpherson C B (1962) The Political Theory of Possessiveness Individualism, Oxford University press, oxford
5. Hampsher-monk I (2001) A History of Modern Political Thought: Major Political Thinkers fromHobbers to Marx,Blackwell publishers, oxford

THIRD YEAR; SEMESTER –VI
B.A. POLITICAL SCIENCE
PAPER-VII : PRINCIPLES OF PUBLIC ADMINISTRATION

Unit-1: Nature of Public Administration

1. Meaning, Nature and Scope of Public Administration
2. Significance of Public Administration
3. Public and Private Administration

Unit-2: Administrative Theories

1. Classical Theory-Henry Fayol
2. Human Relations theory-Elton Mayo
3. Rational Decision making theory-Herbert Simon

Unit-3: Principles of Organization

1. Hierarchy- Span of control-Unity of command
2. Decision Making-Communication
3. Co-ordination-leadership

Unit-4: Structure of organization

1. Chief Executive-Types and Functions
2. Department-Bases of Departmentalization
3. Line and Staff Agencies

Unit-5: Theories of Motivation

1. Meaning and importance of Motivation
2. Hierarchy of needs theory; Abraham Maslow
3. Theories of X and Y ; Donglas Mc Gregor

Reference books:

1. Pardhasaradhi (Eds) (2011) Public Administration; Concepts, Theories and Principles, Telugu Academy, Hyderabad
2. R.kSapru (2014) 3rd Edition, Administrative Theories and Management Thought, PHI learning Pvt.Ltd, New Delhi.
3. Prasad D R, Prasad V S,(Eds) (2010),Administrative Thinkers, Sterling Publishers, NewDelhi.

THIRD YEAR; SEMESTER – VI
B.A. POLITICAL SCIENCE

(Cluster Elective)

PAPER: VIII-A1: INTERNATIONAL RELATIONS

Unit- I: Basic Concepts of International Relations

1. Meaning, Nature and Scope of International Relations
2. (a). Balance of power (b). National interests
   (c). Collective Security (d). Diplomacy

Unit-II: Approaches to the study of International Relations

1. Idealism – Woodrow Wilson
2. Classical Realism – Hans Morgenthau
3. Neo – realism – Kenneth Waltz

Unit-III: Phases of International Relations (1914-1945)

1. Causes for the First World War
2. Causes for the Second World War

Unit-IV: Phases of International Relations (1945 onwards)

1. Origins of First Cold War
2. Rise and Fall of Détente
3. Origins and the End of Second Cold War

Unit-V: International Organisation

1. The role of UNO in the protection of International Peace
2. Problems of the Third World : Struggle for New International Economic Order

Reference Books:

1. Jackson, R and Sorensan Y, Introduction to International Relations; Theories and approaches, New York, OUP, 2008.
2. Baylis, J and Smith, S (Eds), The Globalization of World Politics; An Introduction to International Relations, Oxford, OUP,2011
3. Aneek Chatterjee, International Relations Today; Concepts and Applications,New Delhi, Pearson Education, 2008.
4. E.H. Carr, International relations between the two world Wars, Lodon,Palgrave Macmillan, 2004.

THIRD YEAR; SEMESTER –VI
B.A. POLITICAL SCIENCE
PAPER:VIII-A2: INDIAN FOREIGN POLICY

Unit- I: Evolution of Indian Foreign of Policy

1. Determinants of Indian Foreign of Policy
2. Continuity and change in Indian Foreign Policy

Unit-II: Non-Alignment and UNO

1. The role of India in the Non-Alignment Movement
2. Relevance of Non-Aligned Movement in the Contemporary World
3. Role of India in the UNO in protection of International Peace

Unit-III: India's Relation with USA and China

1. Indo- US Relations: Pre- Cold War Era, Post- Cold War Era
2. India – China Relations: Pre- Cold War Era, Post- Cold War Era

Unit-IV: India and her Neighbours

1. Indo- Pakistan Relations
2. India's role in South Asian Association of Regions Cooperation (SAARC)

Reference Books:

1. David Scott (Ed), Handbook of India's International Relations, London, Routledge,2011
2. Ganguly, S (Ed), India as an Emerging Power,Portland, Franck class, 2003
3. Pant, H, Contemporary Debates in Indian Foreign and Security Policy, London, Palgrave Macmillian,2008
4. Tellis, A and Mirski, S (Eds), Crux of Asia; China, India, and the Emerging global Order, Washington, Carnegie endowment for international peace,2013
5. Muni, S.D, India's Foreign Policy Delhi CUP, 2009
6. Alyssa Ayres and Raja Mohan, C (Eds), Power Realignment in Asia: China, India and the United States, New Delhi, Sage, 2002.
7. Appadorai, A, Domestic roots of Indian Foreign Policy, New Delhi, OUP,1971 Dutt, V.P, India's Foreign Policy in a Changing World, New Delhi,NBT,2011

THIRD YEAR; SEMESTER – VI
B.A. POLITICAL SCIENCE
PAPER: VIII-A3 : CONTEMPORARY GLOBAL ISSUES

Unit- I: Conceptions of Globalization

1. Economic Conception of Globalization
2. Political Conception of Globalization

Unit-II: Anchors of Global Political Economy

1. International Monetary Fund – Nature, Role and Functions
2. Work Bank-Nature, Role and Functions
3. World Trade Organization: Origin, Nature and role in the context of Globalization

Unit-III: Nation State and Globalization

1. The role of Nation State in the context of Globalization
2. Consequences of Globalization – Rise of Inequalities within and across Nations

Unit-IV: Contemporary Global issues

1. Ecological Issues: International Agreements On Climate Change
2. International Terrorism: Non- State Actors and State Terrorism

Reference Books:

1. Ritzer, G., Globalization: A Basic Text, Sussex: Wiley- Black well,2009
2. Streger, M., Globalization: A Very Short Introduction, Oxford, OUP,2013
3. Heywood, A., Global Politics, New York, Palgrave Macmillian,2011
4. Held, D et.al, Global Transformations; Politics, Economics and culture California, Stanford University Press,1999
5. J. Volger, 'Environmental Issues'in J. Baylis, S. Smith an owens, P(Eds) Globalization of world politics, New York, Palgrave,2011

Andhra Pradesh State Council of Higher Education

B.A. Special Telugu Syllabus Under CBCS
W.e.f. 2015-16 (Revised in April - 2016)
SEMESTER - V

Paper - V

I. మాండలికాలు – రకాలు

II తెలుగు – తెనుగు – ఆంధ్రము పుట్టు పూర్వోత్తరాలు

III భారతదేశంలో భాషా కుటుంబాలు

IV ద్రావిడ భాషల్లో తెలుగుకు గల స్థానం

V అర్థ విపరిణామం.

ఆధార గ్రంథాలు:

1. భాషాశాస్త్ర సిద్ధాంతాలు – దా।.పి.యస్. సుబ్రహ్మణ్యం
2. తెలుగు భాషా చరిత్ర – ఆచార్య భద్రిరాజు కృష్ణమూర్తి
3. ఆంధ్రభాషా వికాసం – ఆచార్య గంటి జోగి సోమయాజులు
4. వ్యవహారిక భాషా స్వరూపం – దా। బూదరాజు రాధాకృష్ణ
5. తెలుగు భాషా చరిత్ర – దా। స్పూర్తి శ్రీ
6. ఆధునిక తెలుగు భాషా శాస్త్ర విజ్ఞానం– ఆచార్య నేతి అనంత రామశాస్త్రి
7. మాండలిక వృత్తి పదకోశం – భద్రిరాజు కృష్ణమూర్తి
8. ద్రావిడ భాషలు – పి.ఎస్. సుబ్రహ్మణ్యం

Andhra Pradesh State Council of Higher Education

B.A. Special Telugu Syllabus Under CBCS
W.e.f. 2015-16 (Revised in April - 2016)
SEMESTER - V

Paper - VI

I. బాల వ్యాకరణం - సంధి, సంజ్ఞా పరిచ్ఛేదాలు

II అలంకారాలు - ఉపమ-ప్రతీప-రూపకం-అపహ్నుతి-ఉల్లేఖం-ఉత్ప్రేక్ష-అతిశయోక్తి-దృష్టాంత-నిదర్శనం - అర్థాంతరన్యాసం - స్వభావోక్తి.

III ఛందస్సు - వృత్తాలు, జాతులు, ఉపజాతులు

IV యతులు-స్వరయతి, గూఢస్వరయతి, అనునాసిక యతి, వర్గయతి, అనుస్వారయతి, ఱువళి, ఱుత్వసామ్యవళి.

V ప్రాసలు-ద్విప్రాస, త్రిప్రాస, చతుష్ప్రాస, సమప్రాస, దుష్కరప్రాస, అంత్యప్రాస.

ఆధార గ్రంథాలు:

1.	బాల వ్యాకరణం-ఘంటాపథ వ్యాఖ్య	-	పంతరాం రామకృష్ణారావు
2.	బాల వ్యాకరణ రమణీయము	-	దూసి వేంకట రమణశాస్త్రి
3.	బాల వ్యాకరణము- శ్రీ ప్రభావ్యాఖ్య	-	పి. నరసింహా రెడ్డి.
4.	ఆంధ్ర చంద్రాలోకం	-	అక్కిరాజు ఉమాకాన్తమ్.
5.	బాలప్రౌఢ వ్యాకరణ సర్వస్వం	-	స్ఫూర్తి శ్రీ
6.	అప్పకవీయం	-	బులుసు వేంకట సత్యనారాయణమూర్తి

స్పెషల్ తెలుగు

సెమిస్టర్-06. పేపర్ - 7 (ఎలక్టివ్-1)

అలంకార శాస్త్రం

ప్రాచీన కవితా నిర్మాణ పద్ధతులు

1. కావ్యము

కవి కావ్యము, నిర్వచనాలు: భారతీయ ఆలంకారికులు, తెలుగు ఆలంకారికులు. కావ్య ప్రయోజనం , కావ్య భేదాలు, కావ్య హేతువులు

2. రసము:

రస నిర్వచనం, (విభావ, అనుభావ, సాత్విక, సంచారి భావాలు), రసము - యన్నిష్టము రసము- రసభేదాలు.

3. ధ్వని

ధ్వని నిర్వచనం, ధ్వని సిద్ధాంతం, అభిధ, లక్షణ, వ్యంజన, ధ్వని భేదాలు

4. కళలు - లలిత కళలు:

దృశ్య - శ్రవ్య కళలు, లలిత కళల్లో కవిత్వ స్థానం.

ఆధార గ్రంథాలు:

1.	సాహిత్య శిల్ప సమీక్ష	-	పింగళి లక్ష్మీకాంతం
2.	సాహిత్య సోపానాలు	-	దివాకర్ల వేంకటావధాని
3.	కావ్యా లోకము	-	సందూరి రామకృష్ణమాచార్య
4.	భారత ధ్వని దర్శనము	-	శలాక రఘునాథ శర్మ
5.	రసోల్లాసము	-	ఆచార్య జి.వి. సుబ్రహ్మణ్యం.

స్పెషల్ తెలుగు

సెమిస్టర్-06. పేపర్ -8

జర్నలిజం

1. సమాచార వినిమయం (కమ్యూనికేషన్)

కమ్యూనికేషన్ నిర్వచనం, రకాలు, డైరెక్ట్ కమ్యూనికేషన్, వెర్బల్ కమ్యూనికేషన్, నాన్ వెర్బల్ కమ్యూనికేషన్, ఇంటర్ పర్సనల్ కమ్యూనికేషన్, ఇంట్రా పర్సనల్ కమ్యూనికేషన్, ఇండోర్ కమ్యూనికేషన్, ఔట్‌డోర్ కమ్యూనికేషన్, మాస్ కమ్యూనికేషన్.

2. జర్నలిజం:

రిపోర్టింగ్, ఎడిటింగ్, నిర్వచనాలు, రకాలు, రిపోర్టర్ అర్హతలు, లక్షణాలు, విధులు, ఎథిక్స్ ఆఫ్ రిపోర్టింగ్, ఎడిటింగ్, సబ్ ఎడిటర్, అర్హతలు, లక్షణాలు, బరువు బాధ్యతలు.

3. న్యూస్ ఫీచర్స్:

ఫీచర్ న్యూస్, స్పాట్ న్యూస్, న్యూస్ ఈవెంట్స్, న్యూస్ హెడ్స్, న్యూస్ లీడ్స్, అన్ని రకాల న్యూస్‌లు, ఫీచర్ లక్షణాలు, రకాలు.

4. తెలుగు పత్రికల చరిత్ర:

తెలుగు పత్రికల ఆవిర్భావ వికాసాలు, తొలి దశ, మలిదశ, పరిణామ దశ, విస్తరణ దశ, వికాసదశ, తెలుగు పత్రికల వర్గీకరణ, రకాలు, తెలుగు పత్రికలు, పాత్రికేయులు.

ఆధార గ్రంథాలు:

1.	జర్నలిజం పరిచయం	-	బూదరాజు రాధాకృష్ణ
2.	తెలుగు జర్నలిజం	-	డా॥ వి. లక్ష్మణ రెడ్డి
3.	తెలుగు జర్నలిజం	-	దుర్గం రవీందర్
4.	తెలుగు జర్నలిజం చరిత్ర - వ్యవస్థ	-	రాపోలు ఆనంద భాస్కర్
5.	సమాచారాల చేరవేత, పాత్రికేయత్వం	-	డా॥ యస్.జి.డి. చంద్రశేఖర్

స్పెషల్ తెలుగు

సెమిస్టర్-06. పేపర్ -8

ఆధునిక తెలుగు భాషా నిర్మాణం:

1. ఆధునిక తెలుగు భాష - సంధి, సమాస, లింగ, వచన, విభక్తి నిర్మాణం.
2. ఆధునిక తెలుగు భాష - క్రియ, ప్రాతిపదికల నిర్మాణం. అకర్మక, సకర్మక, ప్రేరణార్థక, సమాపక, అపమాపక క్రియలు.
3. తెలుగు వాక్య నిర్మాణం. వాక్య బేధాలు- సామన్య, సంశ్లిష్ట, సంయుక్త, క్రియా రహిత, క్రియాసహిత యత్తదర్థక వాక్యాలు కర్మణి, కర్తరి ప్రయోగాలు, ప్రత్యయాలు - పురుష బోధక, అర్థ బోధక, కాల బోధక ప్రత్యయాలు, నామ్నీకరణ.
4. తెలుగు భాషా అధునికీ కరణ ఆవశ్యకత, పద్ధతులు - సమస్యలు - తెలుగు భాష ప్రామాణీకరణ - ఆవశ్యకత, సమస్యలు

అధార గ్రంథాలు:

1. ఆధునిక ప్రామాణికాంధ్ర వ్యాకరణం - వర్ధుల వెంకటేశ్వర్లు.
2. ఈనాడు భాషాస్వరూపం - బూదరాజు రాధాకృష్ణ
3. తెలుగు భాషా తత్వం - కొమర్రాజు వేంకట లక్ష్మణరావు
4. తెలుగు భాషా చరిత్ర - (సం)భద్రిరాజు కృష్ణమూర్తి.
5. తెలుగులో వెలుగులు - చేకూరి రామారావు
6. తెలుగు వాక్యం - చేకూరి రామారావు
7. వాడుక భాషే రాస్తున్నామా? - ముప్పాళ్ళ రంగనాయకమ్మ

స్పెషల్ తెలుగు

సెమిస్టర్-06. పేపర్ -8

తెలుగు అనువాదం

1. అనువాదం:

స్వరూప స్వభావాలు, అనువాద నిర్వచనం, అనువాద ప్రమాణాలు, మూలభాష, లక్ష్యభాష, పదం, పదబంధం, వాక్యం - ఉపవాక్యం, లేఖనం - ప్రతిలేఖనం, అనువాదం శాస్త్రమా, కళా?

2. అనువాదం - రకాలు:

వివిధ రకాల అనువాదాలు (మూల విధేయానువాదం, స్వేచ్ఛానువాదం, సుదీకారపు అనువాదం, యాంత్రిక అనువాదం), అనువాదకుడు - లక్షణాలు-రకాలు.

3. అనువాద సమస్యలు:

భౌగోళిక, భాషా, సాంస్కృతిక సమస్యలు, పరిష్కార మార్గాలు, అనువాద ప్రయోజనాలు.

4. అధికార భాషగా తెలుగు:

రాష్ట్ర పాలనా యంత్రాంగంలో జరిగిన, జరుగుతున్న కృషి, అధికార భాష ఆవశ్యకత, అధికార భాషా సంఘం విధులు, హక్కులు, బాధ్యతలు, తెలుగు సజీవ భాషకు దోహదాలు

ఆధార గ్రంథాలు.

1. అనువాద సమస్యలు - రాచమల్లు రామచంద్రా రెడ్డి
2. అనువాద సిద్ధాంతాలు - డా। ఎస్. అక్కిరెడ్డి
3. అధికార భాషగా తెలుగు - సి. ధర్మారావు
4. అనువాద పాఠాలు - బూదరాజు రాధాకృష్ణ
5. అనువదించడం ఎలా - గోవింద రాజు చక్రధర్

Yogi Vemana University – Kadapa
Syllabus for II B.A. Part – II Urdu

SEMESTER - III
Second year Optional Urdu Paper - III

URDU POETRY
Prescribed book : Gowhare Adab by A.P.Urdu Academy

UNIT – I **MASNAVI – A portion of Gulzar-e-Naseem**
'Aana tajul mulook ka sehrae tilism se'

UNIT – II **GHAZAL – The following Ghazals only:**
1.'Bas ke dushwar hai har kaam' by Ghalib
2. 'Woh adae dilbari ho ke nawae' by Jigar
3. 'Jala ke mashale jan hum' by Majrooh

UNIT – III **NAZM**
1. 'Roohe arzi aadam ka isteqbal karti hai'
By Allama Iqbal
2. 'Sagar ke kinare' by Maqdoom

UNIT – IV **Ghazalgo shora ki sawaneh**
1.Ghalib 2.Jigar 3.Majrooh

UNIT – V **Nazmgo shora ki sawaneh**
1.Allama Iqbal 2. Maqdoom

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Yogi Vemana University – Kadapa
Syllabus for II B.A. Part – II Urdu

SEMESTER - IV
Second year Optional Urdu Paper - IV

URDU POETRY
Prescribed book : Gowhare Adab by A.P.Urdu Academy

UNIT – I **QASEEDA – Ta'aruf**

UNIT – II **QASEEDA – Mohsin Kakori (Selected portion)**
'Simte kashi se chala janibe mathura badal'

UNIT – III **MARSIYA – Ta'aruf**

UNIT – IV **MARSIYA – Meer Anees (Selected portion)**
'Namake khwane takallum hai fasahat meri'

UNIT – V **Biography of following poets:**
1.Mohsin Kakori 2. Meer Anees

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Yogi Vemana University – Kadapa
Syllabus for III B.A. Part – II Urdu

SEMESTER – V
Third year Optional Urdu Paper -V
TAREEKH-E-ADAB
Prescribed book : Tariqe Adabe Urdu by Noorul Hasn Naqvi

UNIT – I **Urdu Zaban ka Aghaz o Irteqa**

UNIT – II **Deccani Daur – 1. Mohd.Quli Qutub Shah**
2. Mulla Wajhi
3.Nusrati

UNIT – III **Dabistan-e-Dehli**
1. Meer
2. Sauda
3. Dard
4. Ghalib
5. Momin

UNIT – IV **Dabistan-e-Lukhnow**
1. Insha
2. Jur'at
3. Mushafi
4. Nasiq
5. Aatish

UNIT – V **Nazeer Akbarabadi**

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Yogi Vemana University – Kadapa
Syllabus for B.A. Part – II Urdu

SEMESTER – V
Third year Optional Urdu Paper - VI

TAREEKH-E-ADAB

Prescribed book : Tariqe Adabe Urdu by Noorul Hasn Naqvi

UNIT – I **FORT WILLIAM COLLEGE aur uske Musannafeen**

1. Meer Aman
2. Haidar Bakhs Haidari
3. Sher Ali Afsos

UNIT – II **SIR SYED AHMED KHAN**

UNIT – III **HALI AUR SHIBLI**

UNIT – IV **TARAQQI PASAND TEHREEK**

UNIT – V **TANZ-O-MIZAH**

1. Patras Bukhari
2. Shaukat Thanvi
3. Mushtaq Ahmad Yusufi

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Yogi Vemana University – Kadapa
Syllabus for B.A. Part – II Urdu

SEMESTER - VI
Third year Optional Urdu Paper - VII

ADABI TANQEED

Prescribed book: Fanne Tanqeed aur Urdu Tanqeed Nigari by Noorul Hasan Naqvi

UNIT – I **TANQEED – Mafhoom aur Ahmiyat**

UNIT – II **TANQEED- Agaz –O-Irteqa**

UNIT – III **TANQEED –O-THAQEEQ KA BAHAMI RISHTA**

UNIT-IV **1. TASSURATI TANQEED**
2. TASSURATI NAQID - Majnu Gorakhpuri

UNIT-V **1.MARKSI TANQEED**
2.MARKSI NAQID – Syed Ehtisham Hussain

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Yogi Vemana University – Kadapa
Syllabus for B.A. Part – II Urdu
SEMESTER – VI
Third year Optional Urdu Paper (Cluster Elective)
PAPER- VIII-A1

DABISTANE TANQEED AUR CHAND AHAM TANQEED NIGAR

Prescribed book: Fanne Tanqeed aur Urdu Tanqeed Nigari by Noorul Hasan Naqvi

UNIT-I TANQEED-Maani-o-Mafhoom- Ahmiyat

UNIT-II NAQQAD KE FARAEEZ-TANQEED NIGAR KI QUSUSIYAT

UNIT-III MASHRIQI –O-MAGRIBI TANQEED
TAZKIRATI TANQEED

UNIT-IV TANQEED KE DABISTAN:-

1) TA'ASSURATI TANQEED
2) JAMALIYATI TANQEED
3) TARIQEEPASAND TANQEED
4) SCIENTIFIC TANQEED

UNIT-V CHAND AHAM TANQEED NIGAR:-

1) EHTISHAM HUSSAIN
2) SHIBLI
3) ALE AHMED SUROOR
4) KALEEMUDDIN AHMED

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Yogi Vemana University – Kadapa
Syllabus for B.A. Part – II Urdu

Third year Optional Urdu Paper (Cluster Elective)
PAPER-VIII-A2

HALI AUR MUQADDAMA SHAIR-O-SHAIRI

Prescribed book: Muquddama Shair-o-Shairi by Altaf Hussain Hali

UNIT-I URDU TANQEED MEIN HALI KA MUQAM-O-MARTAB

UNIT-II HALI KE TANQEEDI AFKAR-O-NAZRIYAT

UNIT-III MUQADDAMA SHAIR-O-SHAIRI KA TAROOF-IJMALI JAYAZA

UNIT-IV GAZAL, QASEEDA,MASNAVI AUR MARSIYE KE MUTALIQ HALI KE AFKAR

UNIT-V HALI KI SAWANEH NIGARI:-

1. **HAYATH JAVEED**
2. **HAYATH SADI**
3. **YA'AD GARE GALIB**

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Yogi Vemana University – Kadapa
Syllabus for B.A. Part – II Urdu

Third year Optional Urdu Paper (Cluster Elective)
PAPER-VIII-A3

SPECIAL STUDY OF MOULANA ABUL KALAM AZAD

Prescribed book: Moulana Azad ki Kahani
by Zaffar Ahamed Nizami

UNIT-I BACH'PAN

UNIT-II SAHAFAT

UNIT-III CONGRESS KI SADARAT

UNIT-IV VIZARAT

UNIT-V TASANIF

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B.A., / B.Sc., COMPUTER APPLICATIONS

SYLLABUS

II YEAR III SEMESTER

PAPER- III : NETWORKS AND INTERNET FOUNDATION

UNIT I

Introduction to Network, advantages and disadvantages of network , Types of Networks – Network topologies, Types of topologies- Connecting Devices – Hubs, Repeaters, Bridges, Routers, Network Interface Cards (NIC) and Switches -– Network Operating system - analog and digital signal, analog and digital signal transmission.

UNIT II

Introduction to Network Communication Model- Network Architecture –Application Layer, Presentation Layer, Session Layer, transport Layer, Network Layer, Data-link Layer, Physical Layer.

UNIT III

Introduction to Protocols, TCP/IP Protocol- Protocols and their classification –Address Resolution Protocol(ARP) , Reverse Address Resolution Protocols (RARP) , SMTP, MIME, IMAP, POP, ICMP, HTTP.

UNIT IV

Overview of Internet, revolution of Internet , Internet service providers (ISP) –setting windows environment for dial up networking, search engine, searching web using search engines – audio on internet – newsgroup – subscribing to news groups.

UNIT V

Intranet concepts and architecture, building corporate world wide web protocol, Internet infrastructure, Internet Security design - intranet as business tools, future of intranet.

Bluetooth and other wireless networks.- configuring wireless networks- Security – virus and antivirus, configuring firewalls.

TEXT BOOKS

1. Introduction to Computer Networks by P.K.Singh, VK Global Publications Pvt. Ltd.
2. Wireless Home Networking For Dummies, By Danny Briere, Hurley, Edward Ferris, Wiley publications

REFERENCE BOOKS

1. Computer Networks, Andrew S. Tanenbaum, Pearson edition ,Third Edition
2. Home Networking For Dummies, By Kathy Ivens , Wiley publications

II YEAR IV SEMESTER

Paper – IV: Programming IN C

Unit- I: Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – Some more Algorithms – Flow Charts. **Introduction to C:** Structure of C Program –Writing the first C Program – File used in C Program – Compiling and Executing C Programs –Using Comments – Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples – Type Conversion and Type Casting.

Unit-II: Decision Control and Looping Statements: Introduction to Decision Control Statements –Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Go to Statement.

Unit- III: Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays, **Strings:** Introduction String and Character functions.

Unit- IV: Functions: Introduction – using functions – Function declaration / prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive function.

Unit-V: Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function. **Structure, Union, and Enumerated Data Types:** Introduction – Nested Structures – Arrays of Structures – Structures and Functions - Unions – Enumerated Data Types.

Reference Books:

1. Reema Thareja, Introduction to C programming, Oxford University Press.
2. E Balagurusamy, Programming in ANSI C Tata McGraw-Hill, Sixth Edition.
3. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson Publisher, 2002.
4. Henry Mulish & Hubert L.Coo Reema Thareja: The Spirit of C: An Introduction to Modern Programming, Jaico Publishing House,1996.

BI YEAR V SEMESTER

PAPER – V: DATABASE MANAGEMENT SYSTEMS

UNIT – I:

Database system applications, Database system vs File system, **Views of data**: Data abstraction, Instances and schemas. **Database languages**: DDl, DML. Database users and admistartors, Transaction management, **Database system structure:** Storage manager, Query processor.

UNIT – II:

Database design and ER diagrams: Beyond ER design entities, attributes and entity sets, Relationships and relationship sets, additional features of ER model, Concept design with ER model, Conceptual design for large enterprises.

Relational model: Introduction to the relational model, integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design.

UNIT – III

Schema Refinement: decomposition, problems related to decomposition, FDS: Normalization, Basic normal forms and advanced normal forms.

UNIT – IV

Form of basic SQL query: Examples of basic SQL queries, introduction to nested queries, correlated nested queries set, comparison operators, aggregative operators, null values, comparison using null values, joins. **Views**: Destroying or altering tables and views.

UNIT – V

PL/SQL: Introduction to PL/SQL, structure of PL/SQL program, variables, constants, operators, conditional statements, constraints, procedures, functions.

PAPER – VI-A : ELECTRONIC COMMERCE (ELECTIVE)

Unit I

Electronic Commerce Environment and Opportunities: Background, The Electronic Commerce Environment, Electronic Market place Technologies. **Mode of Electronic Commerce**: Electronic Data Interchange, Migration to Open EDI, Electronic Commerce with WWW/Internet, Commerce Net Advocacy, Web Commerce going forward.

Unit II

Approaches to Safe Electronic Commerce: Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol (SEPP), Secure Electronic transaction (SET), Certificates for authentication Security on Web Servers and Enterprise Networks

Unit III

Electronic Cash and Electronic Payment Schemes: Internet Monetary Payment & Security Requirements, Payment and Purchase Order Process, On-line Electronic cash. **Internet / Intranet Security Issues and Solution:** The need for Computer Security, Specific Intruder Approaches, Security Strategies, Security Tools, Encryption, Enterprise Networking and Access to the Internet, Antivirus Programs, Security Teams.

Unit IV

Master Card / Visa secure Electronic Transaction: Introduction, Business Requirements, Concepts, Payments Processing. **E-Mail and Secure E-Mail technologies for Electronic Commerce**: Introduction The Means of Distribution, A Model for Message Handling, E-Mail Handling, Multipurpose Internet Mail Extensions, Message Object Security Services, Comparisons of Security Methods, MIME and Related Facilities for EDI over the Internet.

Unit V

Internet Resources for Commerce Introduction: Introduction, Technologies for Web Servers, Internet Tools Relevant to Commerce, Internet Applications for Commerce, Internet Charges, Internet Access and Architecture.

TEXT BOOK

Web Commerce Technology Handbook, by Daniel Minoli, Emma Minoli, McGraw-Hill

PAPER VI-B : CLOUD COMPUTING (ELECTIVE)

UNIT I

Introduction & Concepts: Introduction to cloud computing: introduction, characteristics of cloud computing, cloud models, cloud services examples, cloud-based services & applications.

Cloud Concepts & Technologies: Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Networking Function Virtualization, Map Reduce, Identity And Access Management, Service Level Agreements, Billing.

UNIT II

Cloud Services & Platforms: Compute Services, Storage Services, Database Services, Applications Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software.

UNIT III

Cloud Application Design: Introduction, Design Considerations for Cloud Applications, Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

UNIT IV

Python Basics: Introduction, Installing Python, Python Data Types & Data Structures, Control flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes 163.

UNIT V

Python for Cloud: Python for Amazon Web Services, Python for Google Cloud Platform, Python for Windows Azure.

TEXT BOOK:

1. Cloud Computing A Hands On Approach By Arshdeep Bahga And Vijay Madisetti From University Press.

III YEAR VI SEMESTER
PAPER – VII
WEBTECHNOLOGIES

UNIT I

HTML: Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. More HTML: Multimedia objects, Frames, Forms towards interactive, HTML document heading detail.

UNIT II

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

UNIT III

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript: Data and objects in JavaScript, regular expressions, exception handling

UNIT IV

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images,

UNIT V

XML: defining data for web applications, basic XML, document type definition, presenting XML, document object model. Web Services

TEXT BOOKS

1. Web Technologies by A.A.Puntambekar from Technical Publications, Pune

REFERENCE BOOKS

1. INTERNET AND WEB TECHNOLOGIES - Raikamal, TMH.
2. TCP/IP PROTOCOL SUITE - Behrouz A. Forouzan, 3rd edition, TMH.

CLUSTER ELECTIVE
PAPER- VIII-A1 - DESKTOP PUBLISHING TECHNOLOGIES

UNIT I

Basics of Desktop Publishing: what is DTP? – Letterpress Printing – Wooden Types and Metal Types, Hot Metal Types, Printing Photographs - Offset Printing- Gravure – Hardware requirements – Software Requirements – DTP Operator's Arsenal – Test Editors, word Processors, Vector Illustration Applications or drawing Applications, Bitmap Image Editing Application, Page Layout applications - Scanning –Printing –Monitor – briefly Input and Output Devices – Vector graphics and Raster graphics .

UNIT II

Fonts – Font Styles, Serif and Sans Serif, Dimensions of font , Fixed pitch fonts nad proportional spaced fonts, scaling tracking, kerning, leading and ligatures, fonts in your computer, vector fonts and bitmapped fonts - character level and Paragraph level formatting – Drop Caps – Hyphenations – Alignments –Indentation – Single side and Double Side Documents –Headers and Footers – Selecting the text and graphics – Graphic file formats – screen colors (RGB) and Printer colors (CMYK) –Spot colors and Process Colors – Color Separtions – Colur Half-tone images - Generic Process of Desktop Publishing.

UNIT – III

PhotoShop7: Introduction – Parts of Page shop window - Open, Save, Close and Create a Image – Using Toolbox – Tool Options bar – Using layers – Layers palette, adding new layer, Hiding layer, Renaming layer, Remove layer, Merge layer, copy and paste with image – Fascinating colors – Color models, Color Picker, Color palette, Swatches Palette, ICC – Inserting text in images – printing images – filters to improve images .

UNIT – IV

Page Maker7: Introduction of Page Maker- starting of Page Maker – Creating a new publication in Page Maker – Dialog Boxes Document and setup and Save Publication – Close the publication – Text Blocks- drawing a text block by dragging the Mouse cursor, Empty Text block by a Mouse Click.

UNIT V

Fitting text Blocks on a page, Inserting pages while placing Text – Handling Pages – Inserting, Deleting and go to the desired pages – using the Toolbox – Using the Tool Bars – Importing text & Pictures – wrapping text around the pictures – Character level formatting – Opening Multiple Publication windows – Using story editor-Using Styles – Pre-defined styles, new style – Using the Document Master Pages – Sample Publication.

TEXT BOOK

1. Rapidex DTP Course by Shirish Chavan, Unicorn Books Pvt. Ltd., Edition 2005

REFERENCE BOOK

2. DeskTop Publishing English Edition By Ashish Joshi, Jigisha Raval, Pragnesh Patel, Computer world Publications,

CLUSTER ELECTIVE
PAPER –VIII -A2 - MULTIMEDIA SYSTEMS

UNIT II

What is Multimedia?: Definition – Where to use Multimedia – Delivering Multimedia **Text**- The Power of Meaning – About Fonts and Faces – Using Text in Multimedia- Computers and Text – Font Editing and Design Tools – Hyper Media and Hyper Text

UNIT II

Images: Before you Start to Create – Making Still Images – Color – Image File Formats **Sound** – The Power of Sound – Digital Audio – MIDI Audio – MIDI vs Digital Audio – Multimedia System Sounds – Audio File Formats.

UNIT III

Video: Using Video - How Video Works and is Displayed - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video

Making Multimedia: The Stages of a Multimedia Project - What You Need: The Intangibles- What You Need: Hardware - What You Need: Software - What You Need: Authoring Systems

UNIT IV

Planning and Costing: The Process of Making Multimedia – Scheduling -Estimating - RFPs and Bid Proposals

Designing and Producing: Designing - Producing

UNIT V

The Internet and Multimedia: Internet History - Internetworking – Multimedia on the Web

Designing for the World Wide Web: Developing for the Web - Text for the Web -Images for the Web - Sound for the Web - Animation for the Web - Video for the Web

TEXT BOOK

1. Multimedia: Making It Work, Tay Vaughan, 8th Edition, Tara Mc-Graw Hill.

REFERENCE BOOKS

1. Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003
2. Ranjan Parekh, Principles of Multimedia, TMH, 2006.Engineering Evaluation Software
3. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Edition, 2001

CLUSTER ELECTIVE
PAPER –VIII –A3 - PHP and My SQL

Unit-I: Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants.
Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output.
Working with Functions: Defining Functions, Calling functions, returning the values from User- Defined Functions, Variable Scope, Saving State between Function calls with the Static statement, more about arguments.

Unit-II: Working with Arrays: Arrays, Creating Arrays, Some Array-Related Functions. **Working with Objects:** Creating Objects, Object Instance. **Working with Strings, Dates and Time:** Formatting Strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-III: Working with Forms: Creating Forms, Accessing Form - Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads.

Unit-IV: Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen (), Running Commands with exec(), Running Commands with system ( ) or passthru ( ).
Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Unit-V: Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

References:
1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The Web Warrior Guide to Web Programming, Thomson (2006)

YOGI VEMANA UNIVERSITY: KADAPA
B.Sc. - BIOCHEMISTRY(CBCS) SYLLABUS

Semester III
Paper-III : Enzymology and Bioenergetics

Unit-I: Classification of Enzymes and Structure 12 hours

Introduction to biocatalysis, differences between chemical and biological catalysis. Nomenclature and classification of enzymes. Enzyme specificity. Active site. Principles of energy of activation, transition state. Interaction between enzyme and substrate- lock and key, induced fit models. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Fundamentals of enzyme assay, enzyme units.

Unit II: Influence of Physical factors and Inhibitors on Enzyme activity. 12 hours

Factors affecting the catalysis- substrate concentration, *p*H, temperature. Michaelis – Menten equation for uni-substrate reaction (derivation not necessary), significance of *K*M and Vmax. Enzyme inhibition- irreversible and reversible, types of reversible inhibitions- competitive and non-competitive.

Unit-III: Mechanism of enzyme action 12 hours

Outline of mechanism of enzyme action- acid-base catalysis, covalent catalysis, electrostatic catalysis, and metal ion catalysis. Regulation of enzyme activity- allosterism and cooperatitvity, ATCase as an allosteric enzyme, covalent modulation- covalent phosphorylation of phosphorylase, zymogen activation- activation of trypsinogen and chymotrypsinogen. Isoenzymes (LDH). Multienzyme complxes (PDH). Ribozyme.

Unit- IV: Bioenergetics 12 hours

Bioenergetics: Thermodynamic principles – Chemical equilibria; free energy, enthalpy (H), entropy (S). Free energy change in biological transformations in living systems; High energy compounds. Energy, change, oxidation-reduction reactions.

Unit V : Biological Oxidations in Mitochondria 12 hours

Organization of electron carriers and enzymes in mitochondria. Classes of electron-transferring enzymes, inhibiters of electron transport. Oxidative phosphorylation. Uncouplers and inhibitors of oxidative phosphorylation. Mechanism of oxidative phosphorylation.

Practical – 3: Enzymology

List of Experiments: 45 hrs

1. Assay of amylase
2. Assay of urease
3. Assay of catalase.

Semester - IV
Paper-IV : Intermediary Metabolism

Unit- I : Carbohydrate Metabolism 12 hours

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvateformation of lactate and ethanol, Pasteur effect. Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosytnthesis- Light and Dark reactions, Calvin cycle, C4 Pathway. Disorders of carbohydrate metabolism- Diabetes Mellitus.

Unit- II : Lipid Metabolism 12 hours

Catabolism of fatty acids (β- oxidation) with even and odd number of carbon atoms, Ketogenesis, *de novo* synthesis of fatty acids, elongation of fatty acids in mitochondria and microsomes, Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol. Disorders of lipid metabolism.

Unit- III: Metabolism of Amino acids 12 hours

General reactions of amino acid metabolism- transamination, decarboxylation and deamination, Urea cycle and regulation, Catabolism of carbon skeleton of amino acids- glycogenic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acid metabolism.

Unit- IV: Nitrogen Fixation 12 hours

Nitrogen cycle, Non-biological and biological nitrogen fixation, Nitrogenase system. Utilization of nitrate ion, Ammonia incorporation into organic compounds. Synthesis of glutamine and regulatory mechanism of glutamine synthase.

Unit- V: Metabolism of Nucleic acid and heme: 12 hours

Biosynthesis and regulation of purine and pyrimidine nucleotides, *de novo* and salvage pathways. Catabolism of purines and pyrimidines. Biosynthesis of deoxyribo nucleotides ribonucleotide reductase and thymidylate synthase and their significance. Disorders of nucleotide metabolism- Gout, Lesch- Nyhan syndrome.Biosynthesis and degradation of heme.

Practical – 4: Quantitative Analysis
List of Experiments: 45 hrs

1. Estimation of amino acid by Ninhydrin method.

Semester-V
Paper – V : Physiology, Clinical Biochemistry and Immunology

Unit- I : Physiology 12 hours

Digestion and absorption of carbohydrates, lipids and proteins. Composition of blood and coagulation of blood. Hemoglobin and transport of gases in blood (oxygen and CO_2). Muscle- kinds of muscles and mechanism of muscle contraction.

Unit II: Endocrinology 12 hours

Endocrinology- organization of endocrine system. Classification of hormones. Outlines of chemistry, physiological role and disorders of hormones of thyroid, parathyroid, pituitary and hypothalamus. Introduction of gastro intestinal hormones. Mechanism of hormonal action signal transduction pathways for gluco corticoids and insulin. Adrenalin, estrogen and
progesterone.

Unit- III : Nutritional Biochemistry 12 hours

Balanced diet. Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins. Biological value of proteins. Malnutrition- Kwashiorkar, Marasmus and PEM. Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins. Introduction to neutraceutical and functional foods. Bulk and trace elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F. Obesity and starvation.

Unit- IV : Clinical Biochemistry 12 hours

Plasma proteins in health and disease. Disorders of blood coagulation (haemophilia). Types of anemias, haemoglobinopathies-sickle cell anemia. Liver diseases-jaundice. Liver function tests- conjugated and total bilurubin in serum, albumin: globulin ratio, Serum enzymes in liver diseases- SGPT, GGT and alkaline phosphatase. Kidneys-structure of nephron, urine formation, normal and abnormal constituents of urine. Biological buffers. Role of kidneys in maintaining acid-base and electrolyte balance in the body. Renal function test- creatinine.

Unit- V : Immunology 12 hours

Organization of immune system. Organs and cells of immune system. Innate and acquired immunity. Cell mediated and humoral immunity (T- and B- cells). Classification of immunoglobulins, structure of IgG. Epitopes / antigenic determinants. Concept of haptens. Adjuvants. Monoclonal antibodies. Antigen-antibody reactions- agglutination, immunoprecipitation, immunodiffusion. Blood group antigens. Immunodiagnostics- ELISA. Vaccines and their classification. Traditional vaccines-live and attenuated. Modern vaccines- recombinant and peptide vaccines. Outlines of hypersensitivity reactions.

SEMESTER V
Paper – VI(A): Basic Microbiology (Elective-1)

Unit –I : History of Development of Microbiology 12hrs

Development of microbiology as a discipline, Spontaneous generation vs. biogenesis. Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming. Role of microorganisms in fermentation, Germ theory of disease, Development of various microbiological techniques. Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner

Unit-II: Diversity of Microbial world 12hrs

Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility. Difference between prokaryotic and eukaryotic microorganisms. General characteristics of different groups: acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Bacteria, Algae, Fungi and Protozoa) with emphasis on distribution and occurrence and mode of reproduction.

Unit-III : Viruses, Bacteria and Protozoa 12hrs

An introduction to viruses with special reference to the structure and replication of the following: Poxvirus and Poliovirus. Bacterial Diseases- Cholera and Typhoid. TMV and T4 . Protozoan Diseases- Amebiasis and Malaria.

Unit- IV: Algae 12hrs

History of phycology; General characteristics of algae: occurrence, thallus organization, algae cell ultra structure, pigments, flagella, eyespot food reserves and vegetative, asexual and sexual reproduction. Applications of Algae in agriculture, industry, environment and food.

Unit- V: Fungi 12hrs

General characteristics of fungi - habitat, distribution, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis, asexual reproduction, sexual reproduction, heterokaryosis, heterothallism and parasexual mechanism. Economic Importance of Fungi in Agriculture, environment, Industry, medicine, food, biodeterioration, mycotoxins

SEMESTER V
Paper – VI(B) : Molecular Basis of Infectious Diseases (Elective-2)

Unit-I : Classification of infectious agents 12 hrs

Bacteria, Viruses, protozoa and fungi. Past and present emerging and re-emerging infectious
diseases and pathogens. Source, reservoir and transmission of pathogens, Antigenic shift and antigenic drift. Host parasite relationship, types of infections associated with parasitic organisms. Overview of viral and bacterial pathogenesis. Infection and evasion.

Unit-II: Overview of diseases caused by bacteria 12 hrs

Detailed study of tuberculosis: History, causative agent, molecular basis of host specificity, infection and pathogenicity, Diagnostics, Therapeutics, inhibitors and vaccines. Drug resistance and implications on public health. Other bacterial diseases including Typhoid, Diphtheria, Pertussis, Tetanus and Pneumonia.

Unit –III: Overview of diseases caused by Viruses 12 hrs

Detailed study of AIDS, history, causative agent, pathogenesis, Diagnostics, Drugs and inhibitors. Other viral diseases including hepatitis, influenza, rabies, chikungunya and polio.

Unit-IV: Overview of diseases caused by Parasites 12 hrs

Detailed study of Malaria, history, causative agents, Vectors, life cycle, Host parasite interactions, Diagnostics, Drugs and Inhibitors, Resistance, Vaccine development. Other diseases including leishmaniasis, amoebiasis.

Unit-V: Overview of diseases caused by other organisms 12 hrs

Fungal diseases, General characteristics. Medical importance of major groups, pathogenesis,
treatment.

Elective Practical -6B: MOLECULAR BASIS OF INFECTIOUS DISEASES 45 hrs 3 periods/ Week
List of Experiments:

Semester – VI
Paper – VII : Microbiology and Molecular Biology

Unit- I : Microbiology 12hours

Introduction to brief history of microbiology. Classification of microorganisms- prokaryotic and eukaryotic microorganisms. Isolation and cultivation of bacteria. Selective media and enriched media. Bacterial growth curve and kinetics of growth. Gram's staining- Gram positive and Gram negative bacteria, motility and sporulation. Structure and composition of viruses. Isolation and cultivation of bacterial plaques. Lytic and lysogenic life cycle of λ phage. Retro viruses- HIV.

Unit II-Applied Biochemistry 12 hours

Fermentation Technology: Batch, continuous culture techniques, principle types of fermentors. Industrial production of chemicals- alcohol, acids (citric acid), solvents (acetone), antibiotics (penicillin), Enzyme Technology: Immobilization of enzymes and cells, different methods. Industrial applications. Production of transgenic plants and their applications. Introduction to Bioinformatics- definitions of proteomics and genomics. Gene bank, NCBI, DDBJ, Swissprot, PDB. Sequence alignments- BLAST and FASTA.

Unit- III : DNA Replication and Transcription 12 hours

Nature and structure of the gene. DNA replication- models of replication, Meselson-Stahl's experimental proof for semi-conservative model. DNA polymerases I, II and III of *E.coli*, helicase, topoisomerases, primase, ligase. Bidirectional replication model. Okazaki fragments, leading and lagging strands of DNA synthesis. Inhibitors of DNA replication. Transcription - RNA synthesis, RNA polymerases of prokaryotes. Promoters, Initiation- sigma factors and their recognition sites. Elongation- role of core enzyme. Termination- rho dependent and rho independent.

Unit- IV: Protein Synthesis and Regulation of Gene Expression 12 hours

Introduction to protein synthesis- Genetic code, deciphering of genetic code, Nirenberg's and Khorana's experiments, wobble hypothesis, degeneracy of genetic code.
Protein synthesis- activation of amino acids (aminoacyl t-RNA synthetases). Ribosome structure. Initiation, elongation and termination of protein synthesis. Post- translational modifications signal hypothesis. Inhibitors of protein synthesis. Regulation of prokaryotic gene expression- induction and repression. Lac operon.

Unit- V: Recombinant DNA technology 12 hours

Outlines of cloning strategies. DNA sequencing- Maxam Gilbert and Sanger's methods. Tools of r-DNA technology: Enzymes- Restriction endonucleases, ligase, phosphatases, reverse transcriptase, polynucleotide kinases, terminal transferase nucleases-S1 and RNAase H. Restriction mapping. Cloning vectors- Plasmid, Expression vector - Host- *E.coli*.
Construction of c-DNA and genomic libraries. Isolation and sequencing of cloned genes-colony hybridization, nucleic acid hybridization. Polymerase chain reaction- principle and applications. Outlines of blotting techniques-Southern, Northern and Western.
Applications of gene cloning- production of insulin and human growth hormone, production of Bt cotton and edible vaccines.

Practical- 7: Microbiology and Molecular Biology 45 hrs
List of Experiments:

1. Preparation of culture media and sterilization methods.
2. Isolation of pure cultures: (i) Streak plate method. (ii) Serial dilution method.
3. Gram staining.
4. Motility of bacteria by hanging drop method.
5. Antibiotic sensitivity by paper disc method.
6. Isolation of DNA from onion/liver/coconut endosperm.
7. Estimation of DNA by diphenylamine method.
8. Estimation of RNA by orcinol method..
9. Sequence alignments of insulin/BSA with other proteins using BLAST and FASTA.
10. Examination of milk quality by MBRT method.

Semester – VI

Cluster Elective : VIII-A

PAPER-VIII-A1 : NUTRITIONAL BIOCHEMISTRY

Unit-I: Nutririon& Diet

1.1 Introduction & definition-Foods and Nutrition
1.2 Principle food components, balanced diet
1.3 Nutritional requirement & recommended dietary allowance (RDA)
1.4 (BMR) Basal Metabolic Rate
1.5 Body Composition & Energy requirements

Unit-II: Protiens in Nutrition

2.1 Biological value of proteins
2.2 Protien calorie deficiencies
2.3 Kwashiorkan
2.4 Marasmus
2.5 Mal Nutrition

Unit-III: Mineral Nutrients

3.1 Micro Nutrients
3.2 Macro Nutrients
3.3 Dietary sources deficiency and recommended dietary allowances of calcium,phosphorus & Iron
3.4 Dietary sources,deficiency and recommended dietary allowance of trace elements

Unit-IV: Vitamins

4.1 Fat soluble vitamins
4.2 Vitamin 8,D,E & K
4.3 Water soluble vitamins
4.4 Vitamin-6 complex, Vitamin 5, Folic acid

Unit-V: Fatty Acids

5.1 Essential Fatty Acids
5.2 Energy value of fats
5.3 Phospholipids in Nutrition
5.4 Nutrition in pregnancy
5.5 Nutrition for Infants

Practicals:

1. Isolation of starch from Potatoes
2. Isolation of cash in from milk
3. Isolation of lactose
4. Acid value of lipids
5. Determination of fructose from honey
6. Determination of vitamin-C.

PAPER-VIII-A2 : CLINICAL BIOCHEMISTRY

UNIT – I: Basic Medical Laboratory Principles and Procedures: 10 Hours

1.1 Introduction to clinical biochemistry.
1.2 Uses of Biochemical tests
1.3 Specimen Collection and sample analysis, Reference values.
1.4 Quality Control, Automation.

UNIT – II: Clinical Biochemistry of carbohydrates, proteins & Lipids: 20 Hours

2.1 Regulation of Blood Sugar, Tests for Diabetes, Fasting Blood Glucose, PP.
2.2 Glucose Tolerence Test, Glycosylated Hemoglobin.
2.3 Determination of plasma proteins and its importance.
2.4 General lipid Metabolism, functions and disorders of plasma lipoproteins.

UNIT – III: Clinical Enzymology: 10 Hours

3.1 Plasma Enzymes in Diagnosis.
3.2 Chemical significance, SGOT, SGPT, LDH, CK, ALP & Amylase.
3.3 Enzymes in Diagnosis of Liver, Heart muscle disorders.

UNIT – IV: Water & Mineral Metabolism and Acid-Base Balance: 10 Hours

4.1 Body fluid distribution (Electrolyte and water)
4.2 Factors which influence the distribution of body water.
4.3 Acid-Base balance in body, Acidoris and Alkaloris.
4.4 Buffer systems in body to regulate acid-base balance.

UNIT – V: Organ Function Tests: 10 Hours

5.1 Kidney function tests.
5.2 Serum creatamine, Creatamine clearance.
5.3 Liver function tests.
5.4 Ischemic heart disease, Jaundice
5.5 Gastric and pancreatic function tests.

Practicals:

1. Glucose Tolerance test.

Paper: VIII-A3 : MEDICAL MICROBIOLOGY

Unit –I Microbial and Human Interactions:

Normal microbial population of healthy human body - Skin, mouth, upper respiratory tract, intestinal tract, urino-genital tract, eye.

Unit –II Harmful Microbial and Human Interactions :

Entry of pathogens into the host, types of bacterial pathogens, Mechanism of bacterial pathogenicity, colonization and growth, Virulence, Virulence factors – exotoxins, enterotoxins, endotoxins, neurotoxins

Unit –III General Account of Epidemiology:

Principles of epidemiology, Current epidemics (AIDS, Nosocomical, Acute respiratory Syndrome,) Measures for prevention of epidemics –Global health consideration, Emerging and reemerging infectious diseases Biological warfare and biological weapons.

Unit –IV Person to person Microbial disease:

Names of pathogen, disease symptoms, and preventive measures airborne transmission of diseases by airborne pathogens: Streptococcal diseases, Corynebacterium Diphtheria, and Whooping cough, Mycobacterium Tuberculosis Direct contact transmission of diseases: Staphylococcus, Hepatitis viruses. Sexually transmitted diseases: Gonorrhoea and syphilis

Unit –V Animal transmitted, Artropod transmitted, Soil borne and Water borne microbial diseases:

Animal transmitted disease: Rabies Artropod transmitted disease: Malaria Soil borne diseases: Tetanus Water borne microbial diseases: Cholera, Giardiasis,.

List of Experiments: Project work

YOGI VEMANA UNIVERSITY

B.Sc., Biotechnology: Choice Based Credit System

B.Sc., SEMESTER III

PAPER- III : BIOPHYSICAL TECHNIQUES

UNIT – I

Spectrophotometry: Spectrum of light, absorption of electromagnetic radiations, Beer's law - derivation and deviations, extinction coefficient. Instrumentation of Colorimeter; UV and visible spectrophotometry, Double beam spectrometer; dual-wavelength spectrometer, Applications of UV and visible spectrophotometry.

UNIT II:

Chromatography: Partition principle, partition coefficient, nature of partition forces, brief account of paper chromatography. Thin layer chromatography and column chromatography.Gel filtration: Principle, instrumentation and applications .Ionexchange chromatography: Principle, instrumentation and applications Affinity chromatography: Principle, instrumentation and applications .HPLC

UNIT III

Electrophoresis: Migration of ions in electric field, Factors affecting electrophoretic mobility. , Gel electrophoresis: - Types of gels, .SDS-PAGE Electrophoresis and applications. Agarose gel electrophoresis, applications. Isoelectric focusing,Pulsed-field gel electrophoresis.

UNIT – IV:

Isotopic tracer technique: Radioactive & stable isotopes, rate of radioactive decay. Units of radioactivity. Concept of measurement of radioactivity, Cerenkov radiation. Measurement of

Stable isotopes: Falling drop method for deuterium measurement, . Principles of tracer technique, advantages and limitations, applications of isotopes in biotechnology

UNIT V:

Centrifugation: Basic principles, concept of RCF, types of centrifuges (clinical, high speed and ultracentrifuges). Preparative centrifugation: Differential and density gradient centrifugation, applications (Isolation of cell components). Analytical centrifugation: Sedimentation coefficient, determination of molecular weight by sedimentation velocity and sedimentation equilibrium methods.

Biostatistics Basic concepts of mean, median, mode, Standard deviation and Standard error. Introduction to ANOVA

Reference books:

1. Wilson, K. & Walker, J., 2000. Practical Biochemistry.
2. Biophysical chemistry – **Upadhyay,** Himalaya Publication,edition 3, 2005.
3. Fundamentals Of Biostatistics by Khan (Author), Khanum Ukaaz Publications.Hyderabad.

B. Sc. SEMESTER IV

PAPER-IV: IMMUNOLOGY

UNIT I

Immune system: History and introduction to immunology; Organs and cells of immune system; Immunity- types; innate immune mechanism, Acquired immune mechanism. ,

UNIT II

Antibody and Antigen: Antibody structure and classes, Antibody diversity, Types of Antigens, Antigenecity (factors affecting antigenecity), hapten. Complement system.

UNIT III

Immunity: Cell mediated immunity: TC mediated immunity, NK cell mediated immunity, ADCC, brief description of cytokines and MHC (MHC types and diversity), Primary and secondary immune response; Humoral immunity

UNIT IV

Hypersensitivity and vaccination : General features of hypersensitivity, various types of hypersensitivity, Autoimmunity – any two diseases as examples; Vaccination: Discovery, principles, significance, Types of Vaccines.

UNIT V

Immunological Techniques: Antigen-antibody reactions: Precipitation, agglutination, complement fixation, immunodiffusion, ELISA. Hybridoma technology: Monoclonal antibodies and their applications in immunodiagnosis.

References:

1. Immunology by **J.Kubey** (1993) Freeman and company
2. Essential immunology, Ivan Riott, 2000. Blackwell Science, 9th Edition
3. The Elements of Immunology byFahim Halim Khan (2009) Pearson Education Limited

PRACTICAL-IV: IMMUNOLOGY LAB

1. Antigen – antibody reaction – determination of Blood group, Cross reactivity
2. Pregnancy test
3. Widal test
4. Ouchterloney immunodiffusion
5. Radial immunodiffusion
6. ELISA
7. Isolation of casein by isoelectric precipitation
8. Production of antibodies and their titration

Note: - Mandatory to perform atleast 6 practicals

B. Sc. III –Semester V

PAPER- V: MOLECULAR BIOLOGY

Unit I:

Genome Structure: Watson and Crick model of DNA; Genome organization with specific reference to prokaryotic and eukaryotic genomes; Genome size. Concepts of Genetic Material, Gene, Chromosome and Genome. Experiments to prove DNA and RNA as genetic material (Griffith experiment, Hershey- Chase experiment, Fraenkel-Conrat experiment).

Unit II

DNA Replication:Enzymology of replication (DNA polymerase I, pol II and III, helicases, topoisomerases, single strand binding proteins, primase. Proof of semiconservative replication, Replication origin, initiation, elongation, and termination in prokaryotes. Rolling circle replication of DNA.

Unit III

Transcription : Enzymatic synthesis of RNA: Basic features of transcription, structure of prokaryotic RNA polymerase (core enzyme and holo enzyme, sigma factor), concept of promoter (Pribnow box, -10 and -35 sequences), Four steps of transcription (promoter binding and activation, RNA chain initiation, chain elongation, termination and release). Reverse transcription,

Unit IV

Genetic Code and Protein Synthesis

Genetic code: Features of genetic code, Structure of mRNA, brief structure of tRNA, the wobble hypothesis. Initiation, elongation, termination of protein synthesis in prokaryotes; Poly and Mono cistronic m-RNA.

Unit V:

Gene Expression and regulation

Regulation of gene expression; Clustered genes and the operon concepts - Negative and positive control of the Lac Operon, trp operon, Control of gene expression.

References:

1. Molecular cell Biology (III rd Edition), Harvey Lodish, David Baltimore et al., W.H. Freeman, 2000.
2. The Molecular Biology of the Gene, J.D.Watson et al., 1987. Benjamin Cummings
3. Molecular Biology by David Freifelder 2004
4. Genetics by P. K. Gupta (2014) Rastogi Publications

PRACTICAL-V: MOLECULAR BIOLOGY LAB

1. Effect of UV radiations on the growth of microorganisms.
2. Determination of absorption maxima of DNA and RNA and their quantification
3. Quantitative estimation of RNA
4. Quantitative estimation of DNA
5. Isolation of plasmid DNA from bacteria
6. Isolation of genomic DNA from *E.coli*
7. Isolation of DNA from sheep liver

B. Sc. III – Semester V

PAPER-VI(A) : rDNA TECHNOLOGY (Elective Theory)

Unit I:

Restriction and Modification. Classification of restriction endonucleases. Enzymes used in molecular cloning: Polymerases, ligases, phosphatases, kinases and nucleases, reverse transcriptase and terminal transferase.

Unit II

Cutting and joining DNA (cohesive end ligation, methods of blunt end ligation). Transfection and transformation. Selection of transformed cells. Screening methods (Genetic marker and blue white screening)

Unit III:

Cloning vehicles - Plasmid, Bacteriophage, Construction of genomic and cDNA libraries. Advantages of cDNA libraries.

Unit IV:

Methods of gene sequencing – Maxam - Gilberts and Sanger's dideoxy chain termination methods; Polymerase chain reaction technique (Components in PCR and PCR conditions)

Methods of gene transfer in fungi, yeast and higher plants using microinjection, microprojectile bombardment (gene gun method, Electroporation and Agrobacterium mediated transformation

Unit V:

Applications of recombinant DNA technology in Agriculture (Transgenic Plants) Medicine (production of Insulin, Growth harmone, Tissue plasmogen activator and HBsAg vaccine)

References:

1. Principles of Gene Manipulation and Genomics - Primrose, S.B. and Twyman,R.M. 2006. 7th Edition. Blackwell Publishing Company
2. A Text Book of Biotechnology. R.C. Dubey. S.Chand& Co Ltd, New Delhi.
3. Gene Cloning: An introduction by T. A. Brown (1986) 3rd Edition Ghapman & Hall

PRACTICAL-VI(A): rDNA TECHNOLOGY LAB (Elective Lab)

1. Problem in Genetic engineering.
2. Transformation in Bacteria using plasmid.
3. Restriction digestion of DNA and its electrophoretic separation.
4. Ligation of DNA molecules and their testing using electrophoresis.
5. Activity of DNAase and RNAse on DNA and RNA.
6. Isolation of Plasmid DNA.
7. Demonstration of PCR

PAPER-VI(B) : GENETICS (Elective Theory)

UNIT I

Mendel's Laws and Inheritance: Mendel experiments, Mendel Laws and deviations: incomplete dominance and Co dominance Penetration and pleiotropism, Recessive and Dominant epistatic gene interactions. Concept of multiple alleles.

UNIT II

Genes and their variations: Structure of gene, gene and environment, gene copies of prokaryotic and Eukaryotic chromosomes. Eukaryotic chromosome organization, histone proteins.

Unit III:

Gene mutations: Mutagenesis - Spontaneous and induced (Chemical and physical) mutations; Natural and induction of mutations, point mutations, frameshift mutations, auxotrophic conditional and suppressor mutations.

UNIT IV:

DNA Damage and DNA Repair: Factors affecting DNA damage; Light induced repair, Excision repair and mismatch repair, Post replication repair, Rec gene and its role in DNA repair, SOS repair and SOS response

Unit V:

Transposable elements: Structure and Molecular basis of AC-DS transposition in maize, "P" element of Drosophila and hybrid dysgenesis, Yeast "T7" elements, Retroposans

References:

1. Principles of Genetics – **E.J.Gardener, M.J.Simmons and D.P.Snustad,** John Wiley & Sons Publications.
2. Molecular Biology of the Cell – **Alberts.** Garland publication, edition 4, 2002.
3. Genetics by P. K. Gupta (2014) Rastogi Publications

PRACTICAL-VI(B): GENETICS LAB (Elective Lab)

1. Study of different phases of mitosis in onion root tips and meiosis in *Allium cepa* flower buds.

2. Karyotyping in Allium or Drosophila.

3. Determination of multiple allele frequencies of leaf scars in Trifolium.

4. Problems and assignments in Mendilian genetics.

5. Determination of linkage and calculation of recombination frequencies (maize/

B. Sc. III – Semester VI

PAPER-VII : PLANT AND ANIMAL BIOTECHNOLOGY

UNIT I:

Cell and tissue culture:

Introduction to Plant Biotechnology: Principles of plant cell and tissue culture – totipotency, dedifferentiation, redifferentiation; Introduction to cell and Tissue culture Laboratory facilities; Types of media (Eg. MS Media & its composition), Preparation and sterilization.

UNIT II:

Tissue and micropropagation: Somatic embryogenesis and organogenesis; Clonal Propagation of economically important plants (Banana), Production of secondary metabolites through plant tissue culture, Methods in the production of transgenic plants, Bt Cotton, Golden rice.

UNIT III:

Various techniques of animal cell and tissue culture: Basic laboratory facilities of animal cell culture laboratory, Culture media, growth factors. Characteristics of cells in culture: Contact inhibition, anchorage dependence, cell-cell communication etc.; Cell senescence; cell and tissue response to trophic factors. Primary culture, immortal cells, cell lines. d) Maintenance of cell lines in the laboratory.

UNIT IV:

Gene transfer methods in animals: Transgenisis, transgenic methods – microinjection, electroporation, lipofection, embryonic stem cell mediated-, retroviral mediated-.Artificial insemination, In Vitro Fertilization, Embryo transfer in farm animals.Production of Dolly..

UNIT V:

IPR: Intellectual property rights- patent, copyright, trademark etcSocial, ethical and legal issues in Biotechnology.

References:

1. Introduction to Plant Biotechnology Chawla,(2003) (2nd edn) Oxford and IBH Publishers
2. A Text Book of Biotechnology. R.C. Dubey. S.Chand& Co Ltd, New Delhi.
3. Biotechnology, Satyanarayana. U, 2008, Books and Allied (p) Ltd.
4. Basic Biotechnology, S. Ignachimuthu. 1995. Tata McGraw Hill Publishers, New Delhi
5. Elements of Biotechnology by P. K. Gupta (2005) Rastogi Publications
6. Animal Biotechnology Recent Concepts And Developments (2013) MJP Publishers

PAPER-VIII-A1 : ENVIRONMENTAL BIOTECHNOLOGY

Unit I:

Principles of Ecology, Water and terrestrial ecosystems, Bio-geo chemical cycles - Carbon, Nitrogen cycles. Role of microbes in bio-geochemical cycles.

Unit II:

Inorganic and Organic pollutants of air, land and water; maintenance of standards, Environmental monitoring. Detection, treatment and prevention of pollution. Biological indicators

Unit III:

Biocides, Four stage alternatives, Refuse disposal - Treatment methods, effluent from pharmaceuticals, fertilizers, pulp and paper industry.

Unit IV:

Waste water management - Aerobic and anaerobic treatment, primary, secondary and tertiary treatment of municipal wastes, Solid waste management.

Unit V:

Bioremediation, Biodegradation of recalcitrant compounds and the role of genetically engineered microbes and genetically modified organisms in the environmental management.

References:

1. Waste water engineering - treatment, disposal and reuse, Metcalf and Eddy Inc., Tata McGraw Hill, New Delhi.
2. Bioremidation, Baaker, KH and Herson D.S., 1994. Mc.GrawHill Inc, NewYork
3. Environmental biotechnology - **Alan Scragg**, Pearson Education Limited.
4. Environmental Chemistry, AK. De, Wiley Eastern Ltd, New Delhi

PAPER-VIII-A2 : INDUSTRIAL BIOTECHNOLOGY

Unit I:

Isolation, Screening, Preservation and Improvement of Industrially Important Microorganisms. Synthetic and Natural Medium, Precursors, Antifoams, Sterilization Methods and Inoculum Preparation.

Unit II:

Definition of bioreactor, basic principles of bioreactor. Classification of bioreactors. Analysis of batch, continuous, fed batch and semi-continuous bioreactors.

Unit III:

Ethanol Production by Fermentation using Molasses, Starchy Substances. Production of Alcoholic Beverages like Beer and Wine. Production of Citric Acid by Submerged and Solid State Fermentations.

Unit IV:

Sources of Industrial Enzymes, Production of Microbial Enzymes like Amylase and protease. Baker's Yeast and SCP Production. Production of Antibiotics: Penicillin.

Unit V:

Biotechnology Products- Production of recombinant proteins having therapeutic and diagnostic applications (Insulin, Growth Hormone, Recombinant vaccines, Monoclonal Antibody).

References:

1. Industrial Microbiology by L.E Casida, John Wiley and sons INC
2. Industrial microbiology by A.H.Patel, Macillan India Ltd.

PAPER-VIII-A3 : MEDICAL BIOTECHNOLOGY

UNIT- I

Human Genetics and Human Genome: History and development of human Genome Project; organization of the human genome. – chromosome and gene organization -Inherited human diseases-single gene diseases,complex traits.

UNIT- II

Gene Therapy: Identification and isolation of defective genes ,Cancer causes and genetics – Genetic Counselling.

Infectious Diseases: Classification: fungal, protozoal, helminthic, bacterial and viral; Hospital-acquired infections (nosocomial), Sexually transmitted Diseases.

Unit -III

Immunology, Vaccines and Transplantation Technology

Antigens and Antibodies –Acquired and Innate Immunity, Immune system, Immune diseases,Allergy. Immunity to infections by viruses, bacteria, fungi and parasites. Blood groups. Monoclonal antibodies.

Unit -IV

Embryonic Stem cells: Culture & Therapy. Artificial Blood. Aminocentosis. Biochemical and Molecular Diagnostics (PCR, ELISA, FISH, Microarray etc).Drug delivery methods

UNIT- V

Social, Ethical and Legal Issues in Medical Biotechnology

IPR : patents and copyrights. Human cloning. Pre-natal sex determination and foeticide. Clinical Trials introduction.

REFERENCES:

1. Schacter, Bernice (Ed.).2006. Biotechnology and Your Health: Pharmaceutical

YOGI VEMANA UNIVERSITY: KADAPA

Course Structure of B.Sc. Botany under CBCS

II B. Sc - SEMESTER –III: BOTANY THEORY PAPER –III
Paper-III : Plant Taxonomy and Embryology)

Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: INTRODUCTION TO PLANT TAXONOMY (12hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium- functions& important herbaria, Botanical gardens, Flora.
3. Botanical Nomenclature- Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

UNIT – II: CLASSIFICATION **(12 hrs)**

1. Types of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. Engler & Prantle's system of classification- merits and demerits
4. Phylogeny – origin and evolution of Angiosperms

UNIT –III: SYSTEMATIC TAXONOMY-I

(12hrs)

1. Systematic study and economic importance of the following families: Annonaceae, Brassicaceae, Rutaceae, Curcurbitaceae, and Apiaceae.

UNIT –IV: SYSTEMATIC TAXONOMY-II **(12hrs)**

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Ephorbiaceae,Arecaceae,and Poaceae.

UNIT – V: EMBRYOLOGY **(12hrs)**

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia ,Drusa, Adoxa*) of embryo sacs.
3. Pollination and Fertilization (out lines) Endosperm development and types.
4. Development of Dicot and Monocot embryos, Polyembryony.

Suggested activity: Collection of locally available plants of medicinal importance, observing pollen grains in honey, Aero palynology-collection of pollen from air using glycerin strips in

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different seasons

I I B.Sc. BOTANY, SEMESTER- IV, Paper-IV: THEORY SYLLABUS

PAPER –IV: Plant Physiology and Metabolism

Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: Plant – Water relations **(12 hrs)**

1. Physical properties of water, Importance of water to plant life.
2. Diffusion, imbibition and osmosis; concept & components of Water potential.
3. Absorption and transport of water and ascent of sap.
4. Transpiration –Definition, types of transpiration, structure and opening and closing mechanism of stomata.

UNIT –II: Mineral nutrition & Enzymes **(12hrs)**

1. Mineral Nutrition**:** Essential elements (macro and micronutrients) and their role in plant metabolism, deficiency symptoms.
2. Mineral ion uptake (active and passive transport).
3. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
4. Enzymes**:** General characteristics, mechanism of enzyme action and factors regulating enzyme action.

UNIT –III: PHOTOSYNTHESIS **(12 hrs)**

1. Photosynthesis: Photosynthetic pigments, photosynthetic light reactions, photo-phosphorylation, carbon assimilation pathways: C_3, C_4, and CAM (brief account)
2. Photorespiration and its significance.
3. Translocation of organic solutes: mechanism of phloem transport, source-sink relationships.

UNIT – IV: PLANT METABOLISM **(12 hrs)**

1. Respiration: Glycolysis, anaerobic respiration, TCA cycle, electron transport system. Mechanism of oxidative phosphorylation.
2. Lipid Metabolism**:** Types of lipids, Beta-oxidation.

UNIT –V: GROWTH AND DEVELOPMENT

(12hrs)

1. Growth and development: definition, phases and kinetics of growth.

2. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA and Ethylene.
3. Physiology of flowering -photoperiodism, role of phytochrome in flowering; Vernalization.

Suggested activity: Seminars, Quiz, Debate, Question and Answer sessions, observing animations of protein biosynthesis in you tube.

Books for Reference:

1. Steward. F.C (1964): Plants at Work (A summary of Plant Physiology) Addison-Wesley Publishing Co., Inc. Reading, Massachusetts, Palo alto, London.
2. Devlin, R.M. (1969) : Plant Physiology, Holt, Rinehart & Winston & Affiliated East West Press (P) Ltd., New Delhi .
3. Noggle, R.& Fritz (1989):Introductory Plant Physiology Prentice Hall of India.
4. Lawlor D.W. (1989): Photosynthesis, metabolism, Control & Physiology ELBS/Longmans-London.
5. Mayer, Anderson & Bonning(1965): Introduction to Plant Physiology D. Van Nostrand . Publishing Co., N.Y.
6. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.

III B. Sc - SEMESTER- V: BOTANY SYLLABUS THEORY PAPER – V

Paper-V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I Cell Biology: **(12hrs)**

1. Cell, the unit of life- Cell theory, Prokaryotic and eukaryotic cells; Eukaryotic cell components.
2. Ultra structure and functions of cell wall and cell membranes.
3. Chromosomes: morphology, organization of DNA in a chromosome (nucleosome model), Euchromatin and heterochromatin.

UNIT – II Genetic Material: **(12hrs)**

1. DNA as the genetic material: Griffith's and Avery's transformation experiment, Hershey – Chase bacteriophage experiment.
2. DNA structure (Watson & Crick model) and replication of DNA (semi-conservative)
3. Types of RNA (mRNA, tRNA, rRNA), their structure and function.

UNIT – III Mendelian Inheritance: **(12 hrs)**

1. Mendel's laws of Inheritance (Mono- and Di- hybrid crosses); backcross and test cross.
2. Chromosome theory of Inheritance.
3. Linkage: concept, complete and incomplete linkage, coupling and repulsion; linkage maps based on two and three factor crosses.
4. Crossing Over: concept & significance.

UNIT – IV Plant Breeding: **(12 hrs)**

1. Introduction and Objectives of plant breeding.
2. Methods of crop improvement: Procedure, advantages and limitations of Introduction, Selection, and Hybridization (outlines only).

UNIT – V Breeding, Crop Improvement and Biotechnology: **(12 hrs)**

1. Role of mutations in crop improvement.
2. Role of somaclonal variations in crop improvement.
3. Molecular breeding – use of DNA markers in plant breeding and crop improvement (RAPD, RFLP).

Suggested activity: Seminar, Debate, Quiz, observation of live cells and nucleus in Onion peels, observation of Meiotic nuclei in Maize pollen. Solving Genetics problems.

III B. Sc - SEMESTER- V: BOTANY THEORY SYLLABUS

PAPER-VI: PLANT ECOLOGY& PHYTOGEOGRAPHY

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I. Elements of Ecology **(12 hrs)**

1. Ecology: definition, branches and significance of ecology.
2. Climatic Factors: Light, Temperature, precipitation.
3. Edaphic Factor: Origin, formation, composition and soil profile.
4. Biotic Factor: Interactions between plants and animals.

UNIT– II. Ecosystem Ecology **(12 hrs)**

1. Ecosystem: Concept and components, energy flow, Food chain, Food web, Ecologicalpyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

UNIT – II Population &Community Ecology **(12 hrs)**

1. Population -definition, characteristics and importance, outlines –ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, competition.
3. Interaction between plants growing in a community.

UNIT – IV Phytogeography **(12 hrs)**

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Phytogeographic regions of India.
3. Phytogeographic regions of World.
4. Endemism – types and causes

UNIT- V: Plant Biodiversity and its importance **(12 hrs)**

1. Definition, levels of biodiversity-genetic, species and ecosystem.
2. Biodiversity hotspots- Criteria, Biodiversity hotspots of India.
3. Loss of biodiversity – causes and conservation (*In-situ* and *ex-situ* methods).
4. Seed banks - conservation of genetic resources and their importance

Suggested activity :Collection of different soils, studying their texture, observing polluted water bodies, student study projects, debates on man's activity on ecosystem and biodiversity conservation methods, visiting a nearest natural vegetation area. Visit to NGO, working in the field of biodiversity and report writing; to study Honey Bees and plants yielding honey.

III B. Sc - BOTANY SYLLABUS SEMESTER- VI

Paper VII : Plant tissue culture and its biotechnological applications

Total hours of teaching 60hrs @ 3hrs per week

Unit I: PLANT TISSUE CULTURE – 1 **(12hrs)**

1. History of plant tissue culture research - basic principles of plant tissue callus culture, meristem culture, organ culture, Totipotency of cells, differentiation and dedifferentiation.
2. Methodology - sterilization (physical and chemical methods), culture media, Murashige and Skoog's (MS medium), phytohormones, medium for micro-propagation/clonal propagation of ornamental and horticulturally important plants.
3. Callus subculture maintenance, growth measurements, morphogenesis in callus culture – organogenesis, somatic embryogenesis.

UNIT-II: Plant Tissue culture -2 **(12hrs)**

1. Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique.
2. Production of secondary metabolites.
3. Cryopreservation; Germ plasm conservation.

Unit III: Recombinant DNA technology (12**hrs**)

1. Restriction Endonucleases (history, types I-IV, biological role and application); concepts of restriction mapping.
2. Cloning Vectors: Prokaryotic(pUC 18, pBR322,Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC)
3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR mediated gene cloning)
4. Construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by complementation technique, colony hybridization.

Unit IV: Methods of gene transfer **(12hrs)**

1. Methods of gene transfer- Agrobacterium-mediated, direct gene transfer by Electroporation, Microinjection, Micro projectile bombardment.
2. Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit V: Applications of Biotechnology **(12 hrs)**

1. Applications of Plant Genetic Engineering – crop improvement,

Unit V: Applications of Biotechnology **(12 hrs)**

1. Applications of Plant Genetic Engineering – crop improvement,

herbicide resistance, insect resistance, virus resistance.

2. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits - f1a vrSavr tomato, Golden rice); Improved horticultural varieties(Moon dust carnations)

III B.Sc.: BOTANY SYLLABUS SEMESTER- VI

Cluster Electives, CLUSTER–A CLUSTER ELECTIVE, PAPER–VIII-A1

Paper VIII-A1: Biological instrumentation and Methodology

Total hours of teaching 60hrs @ 3hrs per week

Unit -I: Imaging and related techniques: **(12hrs)**

Principles of microscopy; Light microscopy; Fluorescence microscopy; Electron Microscopy (a) Flow cytometry (b) Applications of fluorescence microscopy:

Unit- II: pH and Centrifugation: **(12 hrs)**

pH meter: Principles and instrumentation, Centrifugation: Principles, types of centrifuges, types of rotors, differential and density gradient centrifugation, application.

Unit- III: Spectrophotometry: **(12hrs)**

Principle involved in Spectrophotometer; Spectrophotometric techniques, Instrumentation: ultraviolet and visible spectrophotometry (single and double beam, double wavelength spectrophotometers), Infrared spectrometers.

Unit- IV: Chromatography: **(12hrs)**

Chromatographic techniques: Principle and applications – Column - thin layer –paper, affinity and gaschromatography - Gel filtration - Ion exchange and High performance liquid chromatography techniques– Examples of application for each chromatographic system - Basic principles of electrophoresis.

Unit-V:Preparation of molar, molal and normal solutions, buffers, the art of scientific writing (12hrs)

Understanding the details on the label of reagent bottles.Molarity and normality of common acids and bases.Preparation of solutions.Dilutions.Percentage solutions.Molar, molal and normal solutions.

Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. The art of scientific writing and presentation of scientific matter.Scientific writing and ethics.Writing references.Powerpoint presentation.Poster presentation. Introduction to copyright-academic misconduct/plagiarism in scientific writing.

III B.Sc.: BOTANY SYLLABUS SEMESTER- VI PAPER – VIII-A2

Paper VIII-A2: Mushroom Culture and Technology

Total hours of teaching 60hrs @ 3hrs per week

Unit I: Introduction, history: (12hrs)

Introduction - history - scope of edible mushroom cultivation, Types of edible mushrooms available in India –*Volvariellavolvacea*, *Pleurotuscitrinopileatus*, *Agaricusbisporus*, Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms.

UNIT II:Pure culture-spawn preparation: **(12hrs)**

Pure culture - preparation of medium (PDA and Oatmeal agar medium)sterilization - preparation of test tube slants to store mother culture – culturing of *Pleurotus* mycelium on Petriplates, preparation of mother spawn in saline bottle and polypropylene bag and their multiplication.

Unit III: Cultivation Technology: **(12hrs)**

Infrastructure: Substrates (locally available) Polythene bags, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag.

Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, composting technology in mushroom production.

Unit IV:Storage and nutrition : **(12hrs)**

Short-term storage (Refrigeration - up to 24 hours) Long term Storage (canning, pickels, papads), drying, storage in saltsolutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content – Vitamins.

Unit V:FoodPreparation: **(12hrs)**

Types of foods prepared from mushrooms; soup,cutlet omlette, samosa, pickles and curry .ResearchCentres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

Suggested activities: Growing spawn on laboratory prepared medium in petriplates and maintaining, preparing compost and compost beds, packing of beds, spawning, maintaining moisture, picking, blanching and packing. Collecting naturally growing mushrooms and identifying

III B.Sc.: Botany Syllabus Semester- VI, PAPER – VIII-A3 (Cluster Elective)

Paper VIII-A3: Internship/ Project Work preferably either in an Institute or Industry

GUIDELINES FOR EVALUTION OF PROJECT WORK

Guidelines for evaluation of project work may include the following:

1. Nature of project
2. Quality of work report and final outcome
3. Presentation/ Viva-Voce

For each component to be evaluated and weightages to be assigned to each component are given in table below for awarding sessional marks:

S. No	Items	Maximum Weightage
1.	**Nature of project** ➢ Relevance (5%) ➢ Novelty/ originality (5%) ➢ Degree of challenges involved (5%)	**15%**
2.	**Quality of work report and final outcome**. **a Quality of work :** General appearance, binding and neatness; Utility/feasibility for practical applications: Organization and presentation of text; language and style; quality of diagrams/ graphs etc. ; accuracy in drawing conclusions; cross references; bibliography; suggestions for further work. **b. Quality of final outcome:** Aesthetics; functionality; user friendliness; cost effectiveness	**20%** **30%**
3.	**Presentation/ Viva-Voce** ➢ Understanding of concepts principles, practices, design considerations, results, implications etc. (15%) ➢ Communication skills (10%) ➢ Viva-Voce skills (10%)	**35%**

YOGI VEMANA UNIVERSITY: KADAPA

B.Sc. Chemistry Syllabus under CBCS

Structure of Chemistry Syllabus Under CBCS

SEMESTER - III

Paper III (INORGANIC & ORGANIC CHEMISTRY) 60 hrs (4 h / w)

INORGANIC CHEMISTRY **30 hrs (2h / w)**

UNIT –I

1. Chemistry of d-block elements: **9h**

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states

2. Theories of bonding in metals:

6h

Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

UNIT – II

3.Metal carbonyls : **7h**

EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

4. Chemistry of f-block elements: **8h**

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, comparison of lanthanides and actinides.

ORGANIC CHEMISTRY **30 h (2h/w)**

UNIT – III

1. Halogen compounds **5 h**

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides.

SN^1 and SN^2 – reaction mechanism with optically active alkyl halide 2-bromobutane.

2. Hydroxy compounds 5 h

Nomenclature and classification of Alcohols: Preparation with hydroboration reaction and Grignard synthesis. Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubility in water. Chemical properties:

a) Dehydration of alcohols.

b) Oxidation of alcohols by CrO_3, $KMnO_4$.

Identification of alcohols by oxidation with $KMnO_4$, Ceric ammonium nitrate, Luca's reagent .

Phenols: Preparation i) from diazonium salt, ii) from cumene.

Chemical Properties: a)Bromination, b) Kolbe-Schmidt reaction(with mechanism)

c) Riemer-Tiemann reaction, (with mechanism), d) azocoupling,

Identification of Phenol with neutral $FeCl_3$

UNIT-IV

Carbonyl compounds **10 h**

Nomenclature of aliphatic and aromatic carbonyl compounds, Synthesis of aldehydes from acid chlorides, synthesis of ketones from nitriles. Physical properties: Reactivity of carbonyl group in aldehydes and ketones.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN, c) RMgX, d) NH_2OH, e)$PhNHNH_2$, f) 2,4 DNPH, With mechanism a) Aldol, b) Cannizzaro's reaction, c) Perkin reaction, d) Benzoin condensation, Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$. Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test, d) Schiff's test e) Haloform test (with equation)

UNIT-V

1. Carboxylic acids and derivatives **6 h**

Nomenclature, classificatio of carboxylic acids. Methods of preparation by Hydrolysis of nitriles, amides and esters (by acids and bases), c) Carbonation of Grignard reagents. Special methods of preparation of aromatic acids by a) Oxidation of side chain. b) Hydrolysis by benzotrichlorides. c) Kolbe reaction. **Physical properties**: Hydrogen bonding, dimeric association, **Chemical properties**: Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation,

SEMESTER IV

Paper IV (SPECTROSCOPY & PHYSICAL CHEMISTRY)

60 hrs (4 h / w)

SPECTROSCOPY **30 hrs**

(2h / w)

UNIT-I **6h**

Beer-Lambert's law and its limitations, transmittance, absorbance and molar absorptivity. Application of Beer-Lambert law for quantitative analysis of 1. Chromium in $K_2Cr_2O_7$

2. Manganese in Manganous sulphate

Electronic spectroscopy: **8h**

Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbitals (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore and auxochrome.

UNIT-II

Infra red spectroscopy **8h**

Different Regions in Infrared radiations. Modes of vibrations in diatomic and polyatomic molecules. Characteristic absorption bands of various functional groups. Interpretation of spectra-Alkanes, Aromatic, Alcohols carbonyls, and amines with one example to each.

Proton magnetic resonance spectroscopy (^{1}H-NMR) **8h**

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.

PHYSICAL CHEMISTRY **30 hrs (2h / w)**

UNIT-III

Dilute solutions **10h**

Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. 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. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Theory of dilute solutions. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties- Van't Hoff factor.

UNIT-IV

Electrochemistry-I **10h**

Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorfs method. Application of conductivity measurements- conductometric titrations.

UNIT-V

1. Electrochemistry-II **4h**

Single electrode potential, sign convention, Reversible and irreversible cells Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode, Indicator electrode, metal – metal ion electrode, Inert electrode, Determination of EMF of cell, Applications of EMF measurements - Potentiometric titrations.

2.Phase rule **6h**

Concept of phase, components, degrees of freedom. Thermodynamic Derivation of Gibbs phase rule. Phase equilibrium of one component system - water system. Phase equilibrium of two- component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, simple eutectic diagram, desilverisation of lead., NaCl-Water system.

List of Reference Books

1. Spectroscopy by William Kemp
2. Spectroscopy by Pavia
3. Organic Spectroscopy by J. R. Dyer
4. Modern Electrochemistry by J.O. M. Bockris and A.K.N.Reddy
5. Advanced Physical Chemistry by Atkins
6. Introduction to Electrochemistry by S. Glasstone
7. Elementary organic spectroscopy by Y.R. Sharma
8. Spectroscopy by P.S.Kalsi

SEMESTER-V

Paper - V (INORGANIC, PHYSICAL & ORGANIC CHEMISTRY)
45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT – I

Coordination Chemistry: 8h

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 filed theory - splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes - low spin and high spin complexes - merits of crystal-field theory. Isomerism in coordination compounds - structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

UNIT-II

1. Magnetic properties of metal complexes: 4h

Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility-Gouymethod.

2. Stability of metal complexes: 3h

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.

ORGANIC CHEMISTRY

UNIT- III

Nitro hydrocarbons: **3h**

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 Micheal addition and reduction.

UNIT – IV

Nitrogen compounds: 12h

Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1°, 2°, 3° Amines and Quarternary ammonium compounds. Preparative methods – 1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism).

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. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg

separation e) Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electrophillic substitution of Aromatic amines – Bromination and Nitration. Oxidation of aryl and Tertiary amines, Diazotization.

PHYSICAL CHEMISTRY

UNIT- V

Thermodynamics **15h**

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule-Thomson effect- coefficient. Calculation of w, for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function. 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. Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes.

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mare loudan, Purdue Univ
4. Advanced Physical Chemistry by
5. Text book of physical chemistry by S Glasstone
6. Concise Inorganic Chemistry by J.D.Lee
7. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
8. A Text Book of Organic Chemistry by Bahl and Arun bahl
9. A Text Book of Organic chemistry by I L Finar Vol I
10. Advanced physical chemistry by Gurudeep Raj

SEMESTER-V

Paper - VI (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)

45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT-I

1. Reactivity of metal complexes: 4h

Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2,substitution reactions of square planar complexes - Trans effect and applications of trans effect.

2.Bioinorganic chemistry: 4h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Zn .

Metalloporphyrins – Structure and functions of hemoglobin, and Chlorophyll.

PHYSICAL CHEMISTRY

UNIT-II

1. Chemical kinetics 8h

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. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

2. Photochemistry 5h

Difference between thermal and photochemical processes. Laws of photochemistry-Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield-Photochemical reaction mechanism- hydrogen- chlorine, hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Photosensitized reactions- energy transfer processes (simple example)

ORGANIC CHEMISTRY

UNIT- III

Heterocyclic Compounds 7h

Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1,4,-dicarbonyl compounds, Paul-Knorr synthesis.

Properties : Acidic character of pyrrole - electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.

Pyridine – Structure - Basicity - Aromaticity - Comparison with pyrrole - one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.

UNIT-IV

Carbohydrates **8h**

Monosaccharides: (+) Glucose (aldo hexose) - Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation) - Proof for the ring size (methylation, hydrolysis and oxidation reactions) - Pyranose structure (Haworth formula and chair conformational formula).

(-) Fructose (ketohexose) - Evidence of 2 - ketohexose structure (formation of pentaacetate, formation of cyanohydrin its hydrolysis and reduction by HI). Cyclic structure for fructose (Furanose structure and Haworth formula) - osazone formation from glucose and fructose – Definition of anomers with examples.

Interconversion of Monosaccharides: Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose (D-Glucose to D- Arabinose) by Ruff degradation. Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose)

UNIT- V

Amino acids and proteins **7h**

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: Zwitter ion 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.

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mare loudan, Purdue Univ
4. Advanced Physical Chemistry by Atkins
5. Text book of physical chemistry by S Glasstone

SEMESTER-VI

ELECTIVE PAPER – VII : ENVIRONMENTAL CHEMISTRY

45 hrs (3 h / w)

UNIT-I

Introduction **9h**

Concept of Environmental chemistry-Scope and importance of environment in now adays – Nomenclature of environmental chemistry – Segments of environment - Natural resources – Renewable Resources – Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydological cycle.

UNIT-II

Air Pollution **9h**

Definition – Sources of air pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution.

UNIT-III

Water pollution **9h**

Unique physical and chemical properties of water – water quality and criteria for finding of water quality – Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – principal wastage treatment – Industrial waste water treatment.

UNIT-IV

Chemical Toxicology **9h**

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium.

UNIT-V

Ecosystem and biodiversity **9h**

Ecosystem

Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels – Biogeochemical cycles (carbon, nitrogen and phosporus)

Biodiversity

Definition – level and types of biodiversity – concept - significance – magnitude and distribution of biodiversity – trends - biogeographical classification of india – biodiversity at national, global and regional level.

List of Reference books

1. Fundamentals of ecology by M.C.Dash
2. A Text book of Environmental chemistry by W. Moore and F.A. Moore
3. Environmental Chemistry by Samir k. Banerji

LABORATORY COURSE – VII

1. Determination of carbonate and bicarbonate in water samples (acidity and alkalinity)
2. Determination of hardness of water using EDTA
   a) Permanent hardness
   b) Temporary hardness
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of chlorides in water samples

Cluster Elective –VIIIA

Fuels and Industrial Inorganic materials

PAPER – VIII-A-1 : FUEL CHEMISTRY AND BATTERIES

45 hrs (3 h / w)

UNIT –I **12h**

Review of energy sources (renewable and non-renewable) – classification of fuels and their calorific value. Coal: Uses of Coal (fuel and non fuel) in various industries , its composition , carbonization of coal - coal gas , producer gas and water gas – composition and uses – fractionation of coal tar – uses of coal tar based chemicals , requisites of a good metallurgical coke , coal gasification (Hydro gasification and catalytic gasification) coal liquefaction and solvent refining.

UNIT-II **6h**

Petroleum and petrol chemical industry:

Composition of crude petroleum , refining and different types of petroleum products and their applications.

UNIT-III **10h**

Fractional distillation (principle and process) , cracking (Thermal and catalytic cracking). Reforming petroleum and non petroleum fuels (LPG , CNG , LNG , biogas) ,fuels derived from biomass , fuel from waste , synthetic fuels (gaseous and liquids) , clear fuels , petro chemicals : vinyl acetate , propylene oxide , isoprene , butadiene , toluene and its derivative xylene.

UNIT-IV **10h**

Lubricants:

Classification of lubricants , lubricating oils(conducting and non conducting) , solid and semi solid lubricants , synthetic lubricants. Properties of lubricants (viscosity index , cloud point , pore point) and their determination.

UNIT-V **7h**

Batteries:

Primary and secondary batteries, battery components and their role, Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

Reference books:

1. E.Stochi : Industrial chemistry , Vol-1,Ellis Horwood Ltd.UK
2. P.C.Jain , M.Jain: Engineering chemistry, Dhanpat Rai &sons , Delhi.
3. B.K.Sharma: Industrial Chemistry , Goel Publishing house , Meerut.

SEMESTER-VI

PAPER – VIII-A-2: INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

45 hrs (3 h / w)

UNIT - I

Recapitulation of *s*- and *p*-Block Elements **8h**

Periodicity in *s*- and *p*-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling, Mulliken, and Alfred - Rochow scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

UNIT – II **15h**

Silicate Industries

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and the
setting process, quick setting cements.

UNIT – III **8h**

Fertilizers:

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

UNIT – IV **8h**

Surface Coatings:

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

UNIT – V **6h**

Alloys:

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

Chemical explosives:

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

Reference Books:

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics,* Wiley Publishers, New Delhi.
4. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain & M. Jain: *Engineering Chemistry,* Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry,* Vikas Publications, New Delhi.
7. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut

SEMESTER-VI

PAPER – VIII-A-3 : ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

45 hrs (3 h / w)

UNIT-I

Analysis of soaps: moisture and volatile matter,cobined alkali,total fatty matter, free alkali, total fatty acid, sodium silicate and chlorides.

Analysis of paints :Vehicle and pigments ,Barium Sulphate ,total lead, lead chromate,iron pigments, zinc chromate

UNIT- II

Analysis of oils:saponification value,iodine value,acid value,ester value, bromine value, acetyl value.

Analysis of industrial solvents like benzene,acetone,methanol and acetic acid.,

Determination of methoxyl and N-methyl groups.,

UNIT-III

Analysis of fertilizers: urea,NPK fertilizer,super phosphate,

Analysis of DDT,BHC,endrin,endosulfone,malathion,parathion.,

Analysis of starch,sugars,cellulose and paper,

UNIT -IV

Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen, saturated hydro carbon, unsaturated hydrocarbons, nitrogen, octane number, cetane number

Analysis of Fuel gases like: water gas,producer gas,kerosene (oil) gas.

Ultimate analysis :carbon, hydrogen,nitrogen,oxygen,phosphorus and sulfur.,

UNIT - V

Analysis of Complex materials:

Analysis of cement- loss on ignition, insoluble residu, total silica, sesqui oxides, lime, magnesia, ferric oxide, sulphuric anhydrid.

Analysis of glasses - Determinaiton of silica, sulphuur, barium, arsinic, antimony, total R_2O_3, calcium, magnesium, total alkalies,aluminium,chloride,floride

SUGGESTED BOOKS:

1.F.J.W elcher-Standard methods of analysis,

1.F.J.X ogel-A text book of quantitative Inorganic analysis-ELBS,

3.H.H.Willard and H.Deal- Advanced quantitative analysis- Van Nostrand Co,

4.F.D.Snell & F.M.Biffen-Commercial methods of analysis-D.B.Taraporavala & sons,

5.J.J.Elving and I.M.Kolthoff- Chemical analysis - A series of monographs on analytical chemistry and its applications -- Inter Science- Vol I to VII.,

6.G.Z.Weig - Analytical methods for pesticides,plant growth regulators and food additives - Vols I to VII,

7.Aanalytical Agricultrual Chemistry by S.L.Chopra & J.S.Kanwar -- Kalyani Publishers

II YEAR III SEMESTER
Paper-III : OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives

As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Outcomes

At the end of this course student will:

1. Understand the concept and underlying principles of Object-Oriented Programming
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept
4. Understand the benefits of a well structured program
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java
6. Develop efficient Java applets and applications using OOP concept
7. Become familiar with the fundamentals and acquire programming skills in the Java language.

UNIT – I

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING: Object Oriented paradigm –Basic concepts of Object Oriented Programming – Benefits of OOP –Applications of OOP.

Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens- Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.

Constants, Variables and Data types: Constants – Variables – Data types – Declaration of Variables-Giving Values to variables- Scope of Variables-Symbolic Constants-Type Casting.

UNIT – II

Operators and Expressions: Arithmetic Operators – Relational Operators- Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation 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-Nesting If Else Statement- the Else If Ladder-The switch Statement – The ?: operator.

Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops, labelled loops.

UNIT – III

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods, Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

Arrays, Strings and Vectors: One-dimensional Arrays-creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

UNIT – IV

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 a Package – Adding a Class to a Package – Hiding Classes – Static Import.

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 – Synchronization.

UNIT - V

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.

Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet – More about Applet Tag – Passing parameters to Applets – Aligning the display – More about HTML tags – Displaying Numerical Values – Getting Input from the user.

II YEAR IV SEMESTER

Paper-IV: DATA STRUCTURES

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms..

Course Outcomes

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack .
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

UNIT I

Concept of Abstract Data Types (ADTs)- Data Types, Data Structures, Storage Structures, Primitive and Non-primitive Data Structures, Linear and Non-linear Data Structures.
Linear Lists – ADT, Array and Linked representations, Pointers.

Linked Lists: Single Linked List, Double Linked List, Circular Linked List , applications

UNIT II

Stacks: Definition, ADT, Array and Linked representations, Implementations and Applications
Queues: Definition, ADT, Array and Linked representations, Circular Queues, Dequeues, Priority Queues, Implementations and Applications.

UNIT III

Trees: Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications. Binary Search Trees (BST) – Definition, ADT, Operations and Implementations, BST Applications. Introduction to Threaded Binary Trees, Heap trees.

UNIT IV

Graphs – Graph and its Representation, Graph Traversals, Connected Components, Basic Searching Techniques, Minimal Spanning Trees

UNIT- V

Sorting and Searching: Selection, Insertion, Bubble, Merge, Quick, Heap sort, Sequential and Binary Searching.

REFERENCE BOOKS

1. D S Malik, Data Structures Using C++, Thomson, India Edition 2006.
2. Sahni S, Data Structures, Algorithms and Applications in C++, McGraw-Hill, 2002.
3. SamantaD, Classic Data Structures, Prentice-Hall of India, 2001.
4. Heilman G I,. Data Structures and Algorithms with Object-Oriented Programming, Tata McGraw-l lill. 2002. (Chapters I and 14).
5. Tremblay P, and Sorenson P G, Introduction to Data Structures with Applications, Tata McGraw-Hill,

Student activity:

1. **Create a visible stack using C-graphics**
2. **Create a visible Queue using C-graphics**

III YEAR V SEMESTER

Paper-V: Data Base Management System

Course Objective:

Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes

On completing the subject, students will be able to:

1. Design and model of data in database.
2. Store, Retrieve data in database.

UNIT I

Overview of Database Management System: Introduction, Data and information, Database, Database management System, Objectives of DBMS, Evaluation of Database management System, Classification of Database Management System, file-based system, Drawbacks of file-Based System, advantages of DBMS, Data models, Database Architecture.

UNIT II

Relational Model: Introduction, CODD's Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra.

UNIT III

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, advantages of ER modelling.

UNIT IV

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Table Truncation, Imposition of Constraints, Join Operation, Set Operations, View, Sub Query, Embedded SQL,

UNIT V

PL/SQL: Introduction, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Cursors, Steps to create a Cursors, Procedure, Function, Exceptions Handling.

III YEAR V SEMESTER

Paper VI : Software Engineering

Course Objectives

The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course outcomes

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

UNIT I

INTRODUCTION: Software Engineering Process paradigms - Project management - Process and Project Metrics – software estimation - Empirical estimation models - Planning - Risk analysis.

UNIT II

REQUIREMENTS ANALYSIS: Requirement Engineering Processes – Feasibility Study – Software Requirement Analysis – Analysis Concepts and Principles – Analysis Process – Analysis Model.

UNIT III

SOFTWARE DESIGN: Software design - Abstraction - Modularity - Software Architecture - Effective modular design - Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT IV

USER INTERFACE DESIGN AND REAL TIME SYSTEMS: User interface design - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards.

UNIT V

SOFTWARE QUALITY AND TESTING: Software Quality Assurance - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing.

III YEAR VI SEMESTER

Paper-VII : Web Technologies

Course Objective

- To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
- To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of .NET Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

Unit I

HTML: Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. **More HTML**: Multimedia objects, Frames, Forms towards interactive, HTML document heading detail.

Unit II

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

Unit III

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. **Objects in JavaScript**: Data and objects in JavaScript, regular expressions, exception handling.

Unit IV

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

Unit V

XML: defining data for web applications, basic XML, document type definition, presenting XML, document object model. Web Services.

III YEAR VI SEMESTER
Cluster Elective VIIIA
Paper-VIII–A1 : Foundations of Data Science

Course Objectives

Modern scientific, engineering, and business applications are increasingly dependent on data, existing traditional data analysis technologies were not designed for the complexity of the modern world. Data Science has emerged as a new, exciting, and fast-paced discipline that explores novel statistical, algorithmic, and implementation challenges that emerge in processing, storing, and extracting knowledge from Big Data.

Course Outcomes

1. Able to apply fundamental algorithmic ideas to process data.
2. Learn to apply hypotheses and data into actionable predictions.
3. Document and transfer the results and effectively communicate the findings using visualization techniques.

UNIT I

INTRODUCTION TO DATA SCIENCE : Data science process – roles, stages in data science project – working with data from files – working with relational databases – exploring data – managing data – cleaning and sampling for modeling and validation – introduction to NoSQL.

UNIT II

MODELING METHODS : Choosing and evaluating models – mapping problems to machine learning, evaluating clustering models, validating models – cluster analysis – K-means algorithm.

UNIT III

INTRODUCTION TO R Language: Reading and getting data into R – ordered and unordered factors – arrays and matrices – lists and data frames.

UNIT IV

MAP REDUCE: Introduction – distributed file system – algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce – Hadoop - Understanding the Map Reduce architecture.

UNIT V

DELIVERING RESULTS :Documentation and deployment – producing effective presentations– Introduction to graphical analysis – plot() function – displaying multivariate data.

Reference Books

1.Nina Zumel, John Mount, "Practical Data Science with R", Manning Publications, 2014.
2.Jure Leskovec, Anand Rajaraman, Jeffrey D.Ullman, "Mining of Massive Datasets", Cambridge University Press, 2014.
3.Mark Gardener, "Beginning R - The Statistical Programming Language", John Wiley & Sons, Inc., 2012.
4.W. N. Venables, D. M. Smith and the R Core Team, "An Introduction to R", 2013.
5.Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, Abhijit Dasgupta, "Practical Data Science Cookbook", Packt Publishing Ltd., 2014.
6.Nathan Yau, "Visualize This: The FlowingData Guide to Design, Visualization, and Statistics", Wiley, 2011.
7.Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.

Student Activity:

1. **Collect data from any real time system and create clusters using any clustering algorithm**
2. **Read the student exam data in R perform statistical analysis on data and print results.**

Paper-VIII- A1 Foundations of Data Science Lab

Objectives :

- R is a well-developed, simple and effective programming language which includes conditionals, loops, user defined recursive functions and input and output facilities.
- R has an effective data handling and storage facility,
- R provides a suite of operators for calculations on arrays, lists, vectors and matrices.
- R provides a large, coherent and integrated collection of tools for data analysis.

Outcomes:

1) At end student will learn to handle the data through R.
2) Student will familiar with loading and unloading of packages.

I. Installing R and R studio

II. Basic Operations in r

1. Arthematic Operations
2. Comments and spacing
3. Logical Operators - <, <=, >, >=, = , !=, &&, 1

III.
1. Getting data into R, Basic data manipulation
2. Vectors, Materials, operation on vectors and matrices.

IV.
1. Basic Plotting
2. Quantitative data
3. Frequency plots
4. Box plots
5. Scatter plot
6. 6.Categorial data
7. Bar charts
8. Pie charts

V. Loops and functions

1. if, if else, while, for break, next, repeat.

Basic functions- Print(), exp( ), Log( ), sqrt( ), abs( ), sin( ), Cos( ), tan( ), factorial( ), rand ().

Paper-VIII-A2 : BIG DATA TECHNOLOGY

Course Objective

The Objective of this course is to provide practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem.

Course Outcome

1. Learn tips and tricks for Big Data use cases and solutions.

2. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop.

3. Able to apply Hadoop ecosystem components.

UNIT I

INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four V's in big data, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

UNIT II

INTRODUCTION HADOOP : Big Data – Apache Hadoop & Hadoop Eco-System – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT- III

HADOOP ARCHITECTURE: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode.

UNIT-IV

Hadoop Map Reduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT-V

HIVE AND HIVEQL, HBASE:-Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries.

Reference Books

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al. , "Understanding Big data ", McGraw Hill, 2012.
3. Tom White, "HADOOP: The definitive Guide" , O Reilly 2012.
4. Vignesh Prajapati, "Big Data Analytics with R and Haoop", Packet Publishing 2013.
5. Tom Plunkett, Brian Macdonald et al, "Oracle Big Data Handbook", Oracle Press, 2014.
6. Jy Liebowitz, "Big Data and Business analytics",CRC press, 2013.

Student Activity:

1. Collect real time data and justify how it has become Big Data

2. Reduce the dimensionality of a big data using your own map reducer

Paper-VIII-A3 : COMPUTING FOR DATA ANALYTICS

Course Objectives

The objective of this course is to teach fundamental concepts and tools needed to understand the emerging role of business analytics in Organizations.

Course Outcomes

1. Learn the Big Data in Technology Perspective.
2. Understanding of the statistical procedures most often used by practicing engineers
3. Understand Forecasting methods and apply for business applications.

UNIT – I

DATA ANALYTICS LIFE CYCLE: Introduction to Big data Business Analytics - State of the practice in analytics role of data scientists - Key roles for successful analytic project - Main phases of life cycle - Developing core deliverables for stakeholders.

UNIT – II

STATISTICS Sampling Techniques : Data classification, Tabulation, Frequency and Graphic representation - Measures of central value - Arithmetic mean, Geometric mean, Harmonic mean, Mode, Median, Quartiles, Deciles, Percentile.

UNIT – III

PROBABILITY AND HYPOTHESIS TESTING: Random variable, distributions, two dimensional R.V, joint probability function, marginal density function. Random vectors - Some special probability distribution - Binomial, Poison, Geometric, uniform, exponential, normal, gamma and Erlang. Multivariate normal distribution.

UNIT – IV

PREDICTIVE ANALYTICS: Predictive modeling and Analysis - Regression Analysis, Multicollinearity , Correlation analysis, Rank correlation coefficient, Multiple correlation, Least square, Curve fitting and good ness of fit.

UNIT – V

TIME SERIES FORECASTING AND DESIGN OF EXPERIMENTS : Forecasting Models for Time series : MA, SES, TS with trend, season - Design of Experiments, one way classification, two way classification, ANOVA, Latin square, Factorial Design.

Reference Books

1. Chris Eaton, Dirk Deroos, Tom Deutsch etal., "Understanding Big Data", McGrawHIll, 2012.
2. Alberto Cordoba , "Understanding the Predictive Analytics Lifecycle", Wiley, 2014.
3. Eric Siegel, Thomas H. Davenport , "Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die", Wiley, 2013.
4. James R Evans, "Business Analytics – Methods, Models and Decisions", Pearson 2013.
5. R. N. Prasad, Seema Acharya, "Fundamentals of Business Analytics", Wiley, 2015.
6. S M Ross, "Introduction to Probability and Statistics for Engineers and Scientists", Academic Foundation, 2011.
7. David Hand, Heiki Mannila, Padhria Smyth, "Principles of Data Mining", PHI 2013.
8. Spyros Makridakis, Steven C Wheelwright, Rob J Hyndman, "Forecasting methods and applications", Wiley 2013(Reprint).

Student Activity:

1. **Collect temperatures of previous months and prepare a logic to estimate the temperature of next one week**
2. **Collect real time data and apply statistical techniques to classify it.**

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII : Elective –B-1

Distributed Systems

Course Objectives

- To expose the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission.
- To discuss multiple levels of distributed algorithms, distributed file systems, distributed databases, security and protection.

Course Outcomes

- Create models for distributed systems.
- Apply different techniques learned in the distributed system.

UNIT I

Introduction to Distributed Computing Systems, System Models, and Issues in Designing a Distributed Operating System, Examples of distributed systems.

UNIT II

Features of Message Passing System, Synchronization and Buffering, Introduction to RPC and its models, Transparency of RPC, Implementation Mechanism, Stub Generation and RPC Messages, Server Management.

UNIT III

Introduction, Design and implementation of DSM system, Granularity and Consistency Model, Advantages of DSM, Clock Synchronization, Event Ordering, Mutual exclusion, Deadlock.

UNIT IV

Task Assignment Approach, Load Balancing Approach, Load Sharing Approach, Process Migration and Threads.

UNIT V

File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Atomic Transactions, Access control.

Reference Books

1.Pradeep. K. Sinha: " Distributed Operating Systems: Concepts and Design " , PHI, 2007.
2 .George Coulouris, Jean Dollimore, Tim Kindberg: " Distributed Systems" , Concept and Design, 3rd Edition, Pearson Education, 2005.

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII : Elective –B-2

Cloud Computing

Course Objectives:
The student will learn about the cloud environment, building software systems and components that scale to millions of users in modern internet, cloud concepts capabilities across the various cloud service models including Iaas, Paas, Saas, and developing cloud based software applications on top of cloud platforms.

Course Outcomes

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computing
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player , Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability
6. Design Cloud Services and Set a private cloud

UNIT I

Introduction & Concepts: Introduction to cloud computing: introduction, characteristics of cloud computing, cloud models, cloud services examples, cloud-based services & applications.

Cloud Concepts & Technologies: Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Networking Function Virtualization, Map Reduce, Identity And Access Management, Service Level Agreements, Billing.

UNIT II

Cloud Services & Platforms: Compute Services, Storage Services, Database Services, Applications Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software.

UNIT III

Cloud Application Design: Introduction, Design Considerations for Cloud Applications, Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

UNIT IV

Python Basics: Introduction, Installing Python, Python Data Types & Data Structures, Control flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes 163.

UNIT V

Python for Cloud: Python for Amazon Web Services, Python for Google Cloud Platform, Python for Windows Azure.

TEXT BOOK:

1. Cloud Computing A Hands On Approach By Arshdeep Bahga And Vijay Madisetti From University Press.

Reference Books

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , New Delhi - 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
3. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
4. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madisetti, University Press
5. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christenvecctiola, S Tammarai selvi, TMH

Student Activity:

1. Prepare the list of companies providing cloud services category wise.
2. Create a private cloud using local server

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII : Elective –B-3

Cryptography and Network Security

Course Objectives:
The student will learn about the different security issues in different environments. This will also helps us to learn different sciences in providing security like cryptography and steganography.

Course Outcomes

1. Compare the strengths and limitations of different security mechanisms
2. Address the core issues of security and transmission of information.
3. Develop simple and new algorithms.

UNIT 1:
Introduction: Attacks, services and mechanisms, security attacks, security services, a model for internet work security.
Classical techniques: Conventional encryption model, steganography, classical encryption techniques
Modern techniques: Simplified DES, block cipher principles, data encryption standard, strength of DES, differential and linear crypt analysis, block cipher design principles and modes of operations.

UNIT 2:
Conventional encryption: Placement of encryption function, traffic confidentially, key distribution, random number generation.
Public key cryptography: Principles, RSA algorithm, key management, Diffie-Hellmen key exchange, elliptic curve cryptography.

UNIT 3:
Message authentication and hash functions: Authentication requirements and functions, Message Authentication, Hash functions, security of hash functions and Macs.

UNIT 4:

Hash and MAC algorithms: MD file, message digest algorithm, secure hash algorithm
Digital signatures and authentication protocols: Digital signatures, authentication protocols, digital signature standards

UNIT 5:
Authentication applications: Kerbores, X.509 directory authentication service.
Electronic mail security: Pretty good privacy, S/MIME.
Text Books:

YOGI VEMANA UNIVERSITY: KADAPA

B. Sc ELECTRONICS CBCS SYLLABUS

B.Sc. Electronics Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

SEMESTER – III **PAPER – 3**

Digital Electronics

Unit – I (9hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal, BCD, Conversions, Complements (1's, 2's,9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables),don't care condition.

Unit-III (15hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1)) and Demultiplexers (1:2,4:1), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS Logic families (NAND&NOR Gates),Bi-CMOS inverter

UNIT-IV (14hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF , J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-shift left register, shift right register, Counters - Asynchronous-Mod16,Mod-10,Mod-8,Down counter,,Synchronous-4-bit &Ring counter.

UNIT-V (10hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA(Programmable logic Array),PAL(Programmable Array Logic)

TEXT BOOKS:

1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV)
3. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana&S.Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar

Reference Books :

1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.
3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH. 1994.

4. *Malvino and Leach. " Digital Principles and Applications". TMG Hill Edition.*

B.Sc. Electronics Syllabus under CBCS

SEMESTER – IV **PAPER – 4**

Analog and Digital ic - applictions

(Operational – Amplifiers)

Unit – I (10hrs)

OPERATIONAL AMPLIFIERS: Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground, Adders, subtractors, summing amplifier, voltage follower, op-amp parameters, voltage to current convertor ,integrator, differentiator, differential amplifier, Logarithmic amplifier.

Unit- II (15 hrs)

OP-AMP CIRCUITS: voltage regulator, comparator ,zerocross detecting circuit, instrumentational amplifier, multivibrators-astable, monostable, Bi-stable, Schmitt trigger. sine wave generator, square wave generator, triangular wave generator, Active filters(Basics)-low pass, high pass, band pass filters

IC-555 –functional block diagram and mention it's applications

Unit-III (15hrs):

COMBINATIONAL & SEQUENTIAL LOGIC CIRCUITS (IC-Applications):

Design of Code convertor: BCD to Seven Segment ,BCD to Grey, Grey to Binary.

Design of Counters using State Machine: Mod N counter, Preset Table,Binary Up/Down Counter. Design of Universal Shift Register

UNIT-IV (10hrs)

DATA CONVERTERS:

A/D converter:- Successive Approximation ADC,-Single slope and dual slope converter, Sigma-delta ADC, D/A converter: R-2R Ladder network, Binary Weighted .

UNIT-V (10hrs)

DIGITAL SYSTEM INTERFACING AND APPLICATIONS: interfacing of LED's

Applications of Counters: Digital Clock

Applications of Shift Registers: Parallel to Serial ,Serial to Parallel, UART

TEXT BOOKS:

1. G.K.Kharate-Digital electronics-oxford university press
2. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
3. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
4. Linear Integrated Circuits By Roy Choudary

Reference Books :

1. Jacob Millan ,Micro Electronics,McGraw Hill.
2. Mithal G K, Electronic Devices and Circuits Thana Publishers.
3. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall

3RD YEAR

Semester - V **Paper- V**

TITLE: ANALOG AND DIGITAL COMMUNICATIONS

OBJECTIVES:

- This course provides a thorough introduction to the basic principles and techniques used in analog and digital communications.
- The course will introduce analog and digital modulation techniques.
- Communication receiver and transmitter design, baseband and band pass communication techniques, line coding techniques, noise analysis, and multiplexing techniques.
- The course also introduces analytical techniques to evaluate the performance of communication systems.

UNIT –I (10Hrs) AMPLITUDE MODULATION:

Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave. Generation of AM- Transistor modulators.

Suppression of carrier, balanced modulator, suppression of one side band- the filter method, phase shift method.

UNIT –II (10Hrs) FREQUENCY MODULATION:

Theory of FM, mathematical representation of FM, frequency spectrum of FM wave, narrow band FM, wide band FM, power contents of the carrier and sidebands, Generation of FM signals – Reactance modulator.

UNIT –III (10Hrs) BASIC RECEIVER CIRCUITS:

Noise – Thermal, Shot, Noise figure, Super heterodyne Receiver block diagram, FM receiver, discriminators- slope, balanced slope, phase discriminator & Ratio detector

UNIT –IV (12Hrs) RADIO WAVE PROPAGATION:

Communication bands, Electromagnetic waves, propagation of waves - ground waves, Ionosphere & Space waves. ***PULSE MODULATION:*** Introduction, Sampling Theorem, TDM, FDM, PAM- Generation & Detection PWM- Generation & Detection, PPM- Generation & Detection

UNIT –V (18Hrs) DIGITAL COMMUNICATIONS:

PCM – PCM encoders, Quantization noise, S/N ratio of PCM system, relation between S/N ratio & BW, Companding, Advantages of digital over analog communications. Advantages of shift keying over digital communication, Types of shift keying, ASK – Generation & Detection, FSK – Generation & Detection, PSK – Generation & Detection.

TEXT BOOKS:

1. Electronic Communications - George Kennedy
2. Antennas and Wave Propagation – G.S.N.Raju – PHI
3. Principles of communication system –Herbert Taub & D.L.Schilling

REFERENCES:

1. Electronic Communications – Roody & Colen
2. Communication Systems – Hayken --- 4th Edition
3. Advance Electronic communication system ---Tomasi wayne
4. Modern digital and analog communication system –B.P.lathi

B.Sc. Electronics CBCS Syllabus

3RD YEAR

Semester-V Paper- VI

TITLE: MICROPROCESSOR SYSTEMS

- To understand concept of multi core processors.

UNIT -I: (15Hrs)

CPU ARCHITECTURE

Introduction to Microprocessor, INTEL -8085(P) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085, 8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine language instructions, Instruction Execution timing, Addressing modes

UNIT -II: (10 Hrs)

INSTRUCTION SET:

Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation , Shift and rotate Instruction, Loop Instruction

UNIT -III: (15Hrs)

Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication, Find the largest and smallest number in an array. **Modular programming**:–Linking and Relocation, Stacks, Procedures, Interrupts And Interrupt Routines.

UNIT -IV: (10Hrs)

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces, Parallel Communication, Programmable Timers, Keyboard and display, DMA controller

UNIT -V: (10Hrs)

ARM PROCESSOR

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Programming model, Instruction

TEXT BOOKS:

1. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
2. Microcontrollers Architecture Programming, Interfacing and System Design

   – Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1
3. 8086 and 8088 Microprocessor by Tribel and avatar singh

REFERENCES:

1. Microprocessors and Interfacing – Douglas V.Hall
2. Microprocessor and Digital Systems – Douglas V. Hall
3. Advanced Microprocessors & Microcontrollers - B.P.Singh & Renu Singh – New Age
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Arm ltd.

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3RD YEAR

VI SEMESTER

PAPER-VII : MICRO CONTROLLER AND INTERFACING

OBJECTIVES:

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

UNIT-I: (10Hrs) Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit , Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

UNIT -II: (10Hrs)

Microcontroller Architecture: Overview and block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Port organization, Interrupts and timers.

UNIT-III:(10Hrs)

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Time delay generation and calculation, Timer/Counter Programming,

Unit -IV: (15Hrs)

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V : (15Hrs)

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar), Interfacing a 4*3 matrix keypad. Generation of different types of waveforms using DAC.

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j. Ayalam, Dhananjay V. gadre, cengage publishers

2.The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice Gillispie Mazidi – Pearson Education Asia, 4th Reprint, 2002.

REFERENCE BOOKS:

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj kamal.**
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J.Ajala** , west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V. Deshmukh

OUTCOMES:

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system

ELECTRONICS LAB-VII
MICROCONTROLLER LAB

LAB LIST:

1. Addition And Subtraction Of Two 8-Bit Numbers.
2. Multiplication And Division Of Two 8-Bit Numbers.
3. Exchange Of Higher And Lower Nibbles In Accumulator.
4. Bcd Operation And Reverse And X-Or Of Given Numbers.
5. Addition Of Two 8-Bit Numbers (Keil Software).
6. Addition Of Two 16-Bt Numbers (Keil Software)
7. Subtraction Of Two 8-Bit Numbers (Keil Software).
8. Subtraction Of Two 16-Bit Numbers (Keil Software).
9. Multiplication Of Two 8-Bit Numbers (Keil Software).
11. Program For Swapping And Compliment Of 8-Bit Numbers (Keil Software).
12. Program To Find The Largest Number In Given Array (Keil Software).

3RD YEAR
VI SEMESTER

Cluster-1

PAPER- VIII (A1) : EMBEDDED SYSTEMS DESIGN

TITLE: Embedded Systems Design

OBJECTIVES:

design embedded computer system hardware

design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems

use and describe the implementation of a real-time operating system on an embedded computer system

formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints

create computer software and hardware implementations that operate according to well-known standards

organize and write design documents and project reports

organize and make technical presentations that describe a design.

UNIT 1: (10Hrs)

Introduction to Embedded Systems:

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and Design Technology.

UNIT 2: (15Hrs)

Custom Single Purpose Processor – Hardware Development:

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.

UNIT 3: (15Hrs)

General Purpose Processor – Software Development:

Introduction, Basic Architecture, Operation, Programmer's View, ASIPs, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

UNIT 4: (10Hrs)

RTWA for Embedded Systems:

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, LCD Controllers, Keypad Controllers, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

UNIT 5: (10Hrs)

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, Serial Protocols: I^2C, CAN, FireWire, and USB. Parallel Protocols: PCI BUS and ARM BUS. Wireless Protocols: IrDA, Bluetooth, and IEEE 802.11.

TEXT BOOKS:

1.Embedded System Design – A Unified Hardware / Software Introduction By Frank Vahid / Tony Givargis – WILEY EDITION.

2. Embedded Systems Architecture, Programming and Design – 2nd Edition By Raj Kamal – Tata McGraw-Hill Education.

REFERENCES:

An Embedded Software Premier - David E- Siman, PEARSON Education
Embedded / real - time systems - DR. K.V.K.K. Prasad, dreamtech
The art of programming Embedded systems, Jack G. Ganssle, academic press
Intelligent Embedded systems, Louis L. Odette, Adison Wesly, 1991

OUTCOMES:

The student can gain good knowledge on Embedded Systems and implement in practical applications.
An ability effectively as a member or leader on a technical team
A commitment to quality, timeliness and continuous improvement

B.Sc. Electronics CBCS SYLLABUS

3rd YEAR

VI SEMESTER

PAPER- VIII (A2) ELECTRONIC INSTRUMENTATION

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc	Credits -3

TITLE: ELECTRONIC INSTRUMENTATION

OBJECTIVES:

The student will be introduced to

To introduce students to monitor, analyze and control any physical system

To understand students how different types of meters work and their construction

- To Study of absolute is merely confirmed within laboratories

To Study integrating instruments like ammeter, voltmeter

To Measurement of impedance using bridges

To Study of PLL ,ph-meter, PLC

UNIT-I (10hrs)

Measurements:

Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors, standards &calibrations of an instrument. Applications of instrument

UNIT –II (10hrs)

Basic Measurement Instruments: DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating). Digital Multimeter; Block diagram principle of measurement of I, V, C. Accuracy and resolution of measurement.

Measurement of Impedance- A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De Sauty bridge), Measurement of frequency (Wien's bridge).

UNIT-III (15hrs)

Lock-in-amplifier: Basic Principles of phase locked loop (PLL), Phase detector (XOR& edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture. Basic idea of PLL IC (565 or 4046). Lock-in-amplifier , Idea of techniques for sum and averaging of signals.

Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV (15hrs)

Analytical instruments

Spectrophotometer, working with block diagram, features of spectrophotometer,

P_H meter - principle working with block diagram, features of **P_H** meter.

TEMPERATURE TRANSDUCERS

Standards and calibration, Fluid expansion and metal expansion type transducers, like bimetallic strip, Thermometer, RTD, Thermo couple and their characteristics.

UNIT-V : (10hrs)

Direct digital control (DDC), Distributed control system (DCS),

PLC'S: Block diagram, hardware, PLC operation, basic logic program (ladder logic),

B.Sc. Electronics CBCS syllabus

3rd YEAR
VI SEMESTER

Cluster-1
PAPER- VIII (A3) CONSUMER ELECTRONICS

Unit – I(12hrs)
MICROWAVE OVENS – Microwaves (Range used in Microwave ovens) – Microwave oven block diagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Unit – II(12hrs)
WASHING MACHINES – Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

Unit – III(12hrs)
AIR CONDITIONERS AND REFRIGERATORS - Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

Unit – IV(12hrs)
HOME/OFFICE DIGITAL DEVICES – Fascimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Unit – V(12hrs)
DIGITAL ACCESS DEVICES – Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

TEXTBOKS:
1. S.P. Bali, Consumer Electronics – Pearson Education, New Delhi,2005.
2. R.G. Gupta Audio and Video systems Tata McGraw Hill (2004)

ELECTRONICS LAB
CONSUMER ELECTRONICS LAB

(At least two Activities should be done)

1. Study of PA systems for various situations – Public gathering , closed theatre/ Auditorium, Conference room, Prepare Bill of Material(Costing)
2. Installation of Audio/Video systems – site preparation , electrical requirements , cables and connectors

YOGI VEMANA UNIVERSITY

UG CBCS

B.A. / B.Sc. **MATHEMATICS** COURSE STRUCTURE

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – III

PAPER – III : ABSTRACT ALGEBRA

60 Hrs

UNIT – 1 : (10 Hrs) GROUPS : -

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group. Composition tables with examples.

UNIT – 2 : (14 Hrs) SUBGROUPS : -

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition – examples-criterion for a complex to be a subgroups.

Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups.

Co-sets and Lagrange's Theorem :-

Cosets Definition – properties of Cosets–Index of a subgroups of a finite groups–Lagrange's Theorem.

UNIT –3 : (12 Hrs) NORMAL SUBGROUPS : -

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group – simple group – quotient group – criteria for the existence of a quotient group.

UNIT – 4 : (10 Hrs) HOMOMORPHISM : -

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – aultomorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

UNIT – 5 : (14 Hrs) PERMUTATIONS AND CYCLIC GROUPS : -

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley's theorem.

Cyclic Groups :-

Definition of cyclic group – elementary properties – classification of cyclic groups.

Reference Books :

1. Abstract Algebra, by J.B. Fraleigh, Published by Narosa Publishing house.
2. A text book of Mathematics for B.A. / B.Sc. by B.V.S.S. SARMA and others, Published by S.Chand & Company, New Delhi.
3. Modern Algebra by M.L. Khanna.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Group theory and its applications in Graphics and Medical

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – IV

PAPER- IV : REAL ANALYSIS

UNIT – I (12 hrs) : REAL NUMBERS & INFINITIE SERIES :

The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of supreme property; intervals. Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence.**(No. Question is to be set from this portion.)**

Introduction to series, convergence of series. Cauchy's general principle of convergence for series, tests for convergence of series, Series of Non-Negative Terms.

1. Comparison test
2. Cauchy's n^{th} root test or Root Test.
3. D'-Alemberts' Test or Ratio Test.
4. Alternating Series – Leibnitz Test.

UNIT –II (12 hrs) : CONTINUITY

Limits : Limits of functions. Limits at infinity.

Continuous functions : Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT – III (12 hrs) : DIFFERENTIATION AND MEAN VALUE THEORMS :

The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Role's Theorem, Lagrange's Theorem, Cauchhy's Mean value Theorem

UNIT – IV (12 hrs) : RIEMANN INTEGRATION-I:

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability,Another definition of Riemann integral,Some classes of bounded integrable functions.

UNIT – V (12 hrs) : RIEMANN INTEGRATION-II:

Properties of integrable functions, Fundamental theorem of integral calculus, integral as the limit of a sum, Mean value Theorems.

Reference Books :

1. Real Analysis by Rabert & Bartely and .D.R. Sherbart, Published by John Wiley.
2. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania Published by S. Chand & Company Pvt. Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Real Analysis and its applications

Reference Books :

1. Real Analysis by Rabert & Bartely and .D.R. Sherbart, Published by John Wiley.
2. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisingkania

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – V

PAPER – V : RING THEORY & VECTOR CALCULUS

60 Hrs

UNIT – 1 (12 hrs) RINGS-I

Definition of Ring and basic properties, Boolean Rings, divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring - The characteristic of an Integral Domain, The characteristic of a Field.

UNIT – 2 (12 hrs) RINGS-II

Sub Rings, Ideals, Quotient Rings.

Definition of Homomorphism – Homomorphic Image – Elementary Properties of Homomorphism – Kernel of a Homomorphism – Fundamental theorem of Homomorphism.

UNIT –3 (12 hrs) VECTOR DIFFERENTIATION

Vector Differentiation, Ordinary derivatives of vectors, Differentiability, Gradient, Divergence, Curl operators, Formulae Involving these operators.

UNIT – 4 (12 hrs) VECTOR INTEGRATION

Line Integral, Surface Integral, Volume integral with examples.

UNIT – 5 (12 hrs) VECTOR INTEGRATION APPLICATIONS

Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

Reference Books :-

1. Abstract Algebra by J. Fralieh, Published by Narosa Publishing house.
2. Vector Calculus by Santhi Narayana, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. A text Book of B.Sc., Mathematics by B.V.S.S.Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.
4. Vector Calculus by R. Gupta, Published by Laxmi Publications.
5. Vector Calculus by P.C. Matthews, Published by Springer Verlag publicattions.
6. Rings and Linear Algebra by Pundir & Pundir, Published by Pragathi Prakashan.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Ring theory and its applications

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – V

PAPER – VI : LAPLACE TRANSFORMS

60 Hrs

UNIT – 1 (12 hrs) Laplace Transform - I

Definition of - Integral Transform – Laplace Transform Linearity, Property, Piecewise continuous Functions, Existence of Laplace Transform, Functions of Exponential order, and of Class A.

UNIT – 2 (12 hrs) Laplace Transform - II

First Shifting Theorem, Second Shifting Theorem, Change of Scale Property, Laplace Transform of the derivative of f(t), Initial Value theorem and Final Value theorem.

UNIT – 3 (12 hrs) Laplace Transform - III

Laplace Transform of Integrals – Multiplication by t, Multiplication by t^n – Division by t. Laplace transform of Bessel Function, Laplace Transform of Error Function, Laplace Transform of Sine and cosine integrals.

UNIT –4 (12 hrs) Inverse Laplace Transform - I

Definition of Inverse Laplace Transform. Linearity, Property, First Shifting Theorem, Second Shifting Theorem, Change of Scale property, use of partial fractions, Examples.

UNIT –5 (12 hrs) Inverse Laplace Transform - II

Inverse Laplace transforms of Derivatives–Inverse Laplace Transforms of Integrals – Multiplication by Powers of 'P'– Division by powers of 'P'– Convolution Definition – Convolution Theorem – proof and Applications – Heaviside's Expansion theorem and its Applications.

Reference Books :-

1. Laplace Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Co., Pvt. Ltd., New Delhi.
3. Laplace and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
4. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S. Chand and Co., Pvt.Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – VI

PAPER – VII : LINEAR ALGEBRA - I

60 Hrs

UNIT – I (12 hrs) : Vector Spaces - I

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –II (12 hrs) : Vector Spaces - II

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –III (12 hrs) : Linear Transformations

Linear transformations, linear operators, Properties of L.T, , Determination of L.T, sum and product of L.T's Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank -Nullity Theorem.

UNIT –IV (12 hrs) : Vector Space Isomorphism

Fundamental theorem of homomorphism, Singular and non –singular transformations, inverse function, Uniqueness of inverse.

UNIT –V (12 hrs) : Matrix of a Linear Transformation

Definition of Matrix of a Linear Transformation, Problems on finding the matrix of a Linear Transformation, Transition matrix and problems on transition matrix.

Reference Books :

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

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on "Applications of Linear algebra Through Computer Sciences"

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – VI

Cluster Elective – Paper VIII - A1: INTEGRAL TRANSFORMS

UNIT – I (12 hrs) Application of Laplace Transform to solutions of Differential Equations : -

Solutions of ordinary Differential Equations.

Solutions of Differential Equations with constants co-efficient

Solutions of Differential Equations with Variable co-efficient

UNIT – II (12 hrs) Application of Laplace Transform : -

Solution of simultaneous ordinary Differential Equations.

Solutions of partial Differential Equations.

UNIT – III (12 hrs) Application of Laplace Transforms to Integral Equations : -

Integral Equations-Abel's, Integral Equation-Integral Equation of Convolution Type, Integro Differential Equations. Application of L.T. to Integral Equations.

UNIT – IV (12 hrs) Fourier Transforms: -

Definition of Fourier Transform – Fourier sine Transform – Fourier cosine Transform – Relationship between Fourier and Laplace transforms – Linear Property – Change of Scale Property – Modulation theorem – Derivative theorem – Shifting property – Convolution Theorem for Fourier transform – Problems related to Integral Equations – Parseval's Indentity.

UNIT – V (12 hrs) Fourier Series: -

Fourier series, Fourier series in the interval $[-\pi, \pi]$, Fourier series in the interval $[0, 2\pi]$. Half range series, Fourier sine series in $[0, \pi]$, Fourier cosine series in $[0, \pi]$, Fourier series in the interval $[-l, l]$, Fourier series in the interval $[0, 2l]$, Fourier half range series in $[0, l]$.

Reference Books :-

1. Integral Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. A Course of Mathematical Analysis by Shanthi Narayana and P.K. Mittal, Published by S. Chand and Company pvt. Ltd., New Delhi.
3. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Company Pvt. Ltd., New Delhi.
4. Lapalce and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
5. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S.Chand and Company pvt. Ltd., New Delhi.
6. Fourier series and Integral Transforms by Dr.S.Sreenadh, S.Ranganatham, MVSSN.Prasad, V.Ramesh Babu, S.Chand Publishers.
7. Higher Engineering Mathematics by Grewal.B.S., Khanna Publishers.

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – VI

Cluster Elective – Paper VIII – A2 : NUMERICAL ANALYSIS

60 Hrs

UNIT- I: (12 hours)

Errors in Numerical computations and Solution of Algebraic and Transcendental Equations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation. The bisection method, The iteration method, The method of false position, Newton Raphson method, Generalized Newton Raphson method.

UNIT – II: (12 hours)

Interpolation–I : Errors in polynomial interpolation, Finite Differences, Forward differences, Backward differences, Central Differences, Symbolic relations, Detection of errors by use of Differences Tables, Differences of a polynomial, Newton's formulae for interpolation.

UNIT – III: (12 hours)

Interpolation – II : Central Difference Interpolation Formulae, Gauss's central difference formulae, Stirling's central difference formula.

UNIT – IV: (12 hours)

Interpolation – III : Interpolation with unevenly spaced points, Lagrange's formula, Error in Lagrange's formula, Divided differences and their properties, Relation between divided differences and forward differences, Relation between divided differences and backward differences Relation between divided differences and central differences, Newton's general interpolation Formula.

UNIT – V : (12 hours)

Numerical Differentiation and Integration: Numerical differentiation, The Cubic Spline method, Numerical integration, Trapezoidal Rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall of India Pvt. Ltd., New Delhi. (Latest Edition)
2. Numerical Analysis by G. Sankar Rao published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

B.A./B.Sc. MATHEMATICS SYLLABUS

SEMESTER – VI

Cluster Elective – Paper VIII -A3 : LINEAR ALGEBRA - II

UNIT- I: (12 hours)

Rank of a Matrix : Sub-matrix and Minors of a Matrix, Rank of a Matrix, Elementary transformations, Reduction to Normal Form, Inverse of a Matrix using elementary transformations, Echelon form.

UNIT – II: (12 hours)

Linear Equations: Consistency, System of Homogeneous Linear equations, System of Non-homogeneous Linear equations.

UNIT – III: (12 hours)

Characteristic roots and Vectors of a Square Matrix: Characteristic roots, characteristic vectors, Properties of characteristic vectors, Cayley - Hamilton Theorem, Inverse of a matrix by using Cayley - Hamilton Theorem.

UNIT –IV (12 hrs) : Inner product space - I

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law.

UNIT –V (12 hrs) : Inner product space - II

Orthogonality, Ortho normal set, complete ortho-normal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Reference Books :

1. Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut-250002.
2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low price edition), New Delhi.
3. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.
4. A Text Book on Matrices by P.K.Mittal, S.Chand Co.
5. A Text Book on Matrices by A.R. Vasistha, A.K.Vasistha, Krishna Prashan Media.
6. A Text Book on Matrices by Santhi Narayan, S.Chand Co.

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
SECOND YEAR – SEMESTER- III
PAPER-III : MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS:48 **CREDITS: 4**

UNIT-I No. of hours: 10
DNA and RNA as genetic material. Structure and organization of prokaryotic DNA. Extrachromosomal genetic elements – Plasmids and transposons. Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II No. of hours: 10
Mutations – spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions. Mutagens - Physical and Chemical mutagens. Outlines of DNA damage and repair mechanisms. Genetic recombination in bacteria – Conjugation, Transformation and Transduction.

UNIT-III No. of hours: 10
Concept of gene – Muton, Recon and Cistron. One gene one enzyme and one gene one polypeptide hypotheses. Types of RNA and their functions. Genetic code. Structure of ribosomes.

UNIT-IV No. of hours: 8
Types of genes – structural, constitutive, regulatory Protein synthesis – Transcription and translation. Regulation of gene expression in bacteria – *lac* operon.

UNIT-V No. of hours: 10
Basic principles of genetic engineering. Restriction endonucleases, DNA polymerases and ligases. Vectors. Outlines of gene cloning methods. Polymerase chain reaction. Genomic and cDNA libraries. General account on application of genetic engineering in industry, agriculture and medicine.

PRACTICAL-III : MICROBIAL GENETICS AND MOLECULAR BIOLOGY
TOTAL HOURS: 48 **CREDITS: 2**

1. Study of different types of DNA and RNA using micrographs and model / schematic representations
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
SECOND YEAR – SEMESTER- IV
PAPER- IV: IMMUNOLOGY AND MEDICAL MICROBIOLOGY
TOTAL HOURS: 48 **CREDITS: 4**

UNIT-I No. of hours: 10
Types of immunity – innate and acquired; active and passive; humoral and cell-mediated immunity. Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes. Cells of immune system. Identiification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils.

UNIT-II No. of hours: 10
Antigens – types, chemical nature, antigenic determinants, haptens. Factors affecting antigenicity. Antibodies – basic structure, types, properties and functions of immunoglobulins. Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation, blood groups. Labeled antibody based techniques – ELISA, RIA and Immunofluroscence. Polyclonal and monoclonal antibodies – production and applications. Concept of hypersensitivity and Autoimmunity.

UNIT-III No. of hours: 10
Normal flora of human body. Host pathogen interactions: infection, invasion, pathogen, pathogenicity, virulence and opportunistic infection. General account on nosocomial infection. General principles of diagnostic microbiology- collection, transport and processing of clinical samples. General methods of laboratory diagnosis - cultural, biochemical, serological and molecular methods.

UNIT-IV No. of hours: 8
Antibacterial Agents- Penicillin, Streptomycin and Tetracycline. Antifungal agents – Amphotericin B, Griseofulvin Antiviral substances - Amantadine and Acyclovir Tests for antimicrobial susceptibility. Brief account on antibiotic resistance in bacteria - Methicillin-resistant Staphylococcus aureus (MRSA). Vaccines – Natural and recombinant.

UNIT-V No. of hours: 10
General account on microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention and control Bacterial diseases – Tuberculosis and Typhoid Fungal diseases – Candidiasis. Protozoal diseases – Malaria. Viral Diseases - Hepatitis- A and AIDS

PRACTICAL-IV : IMMUNOLOGY AND MEDICAL MICROBIOLOGY
TOTAL HOURS: 48 **CREDITS: 2**

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- V
PAPER-V : ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY
TOTAL HOURS: 36 **CREDITS: 3**

UNIT - I No. of hours: 8
Terrestrial Environment: Soil profile and soil microflora Aquatic Environment: Microflora of fresh water and marine habitats Atmosphere: Aeromicroflora and dispersal of microbes Extreme Habitats: Extremophiles: Microbes thriving at high & low temperatures, pH, high hydrostatic & osmotic pressures, salinity, & low nutrient levels.

UNIT – II No. of hours: 8
Role of microorganisms in nutrient cycling (Carbon, nitrogen, phosphorus). Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique.Microbial interactions – mutualism, commensalism, antagonism, competition, parasitism, predation.

UNIT – III No. of hours: 6
Outlines of Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill). Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment.

UNIT – IV No. of hours: 7
Plant Growth Promoting Microorganisms - Mycorrhizae, Rhizobia, *Azospirillum, Azotobacter, Frankia,* phosphate-solubilizers and Cyanobacteria. Outlines of biological nitrogen fixation (symbiotic, non-symbiotic). Biofertilizers - *Rhizobium*.

UNIT – V No. of hours: 7
Concept of disease in plants. Symptoms of plant diseases caused by fungi, bacteria, and viruses. Plant diseases - groundnut rust, Citrus canker and tomato leaf curl. Principles of plant disease control.

PRACTICAL-V : ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY
TOTAL HOURS: 36 **CREDITS: 2**
1. Analysis of soil – pH, Moisture content and water holding capacity.

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER -V
PAPER-VI A: MICROBIAL DIAGNOSIS IN HEALTH CLINICS (ELECTIVE)
TOTAL HOURS: 36 **CREDITS: 3**

UNIT- I No. of hours: 8
Bacterial, Viral, Fungal and Protozoan Diseases of various human body systems, Disease associated clinical samples for diagnosis.

UNIT- II No. of hours: 8
Collection of clinical samples (oral cavity, throat, skin, blood, CSF, urine and faeces) and precautions required. Method of transport of clinical samples to laboratory and storage.

UNIT- III No. of hours: 8
Examination of sample by staining - Gram stain, Ziehl-Neelson staining for tuberculosis, Giemsa-stained thin blood film for malaria Preparation and use of culture media - Blood agar, Chocolate agar, Lowenstein-Jensen medium, MacConkey agar, Distinct colony properties of various bacterial pathogens.

UNIT- IV No. of hours: 6
Serological Methods - Agglutination, ELISA, immunofluorescence, Nucleic acid based methods - PCR, Nucleic acid probes. Typhoid, Dengue and HIV, Swine flu.

UNIT- V No. of hours: 6
Importance, Determination of resistance/sensitivity of bacteria using disc diffusion method, Determination of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method

PRACTICAL-VI A: MICROBIAL DIAGNOSIS IN HEALTH CLINICS
TOTAL HOURS: 36 **CREDITS: 2**

1. Collection transport and processing of clinical specimens (Blood, Urine, Stool and Sputum). Receipts, Labeling, recording and dispatching clinical specimens.
2. Isolation of bacteria in pure culture and Antibiotic sensitivity.

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- V
PAPER-VI B : MICROBIAL BIOTECHNOLOGY (ELECTIVE)
TOTAL HOURS: 36 **CREDITS: 3**

UNIT- I No. of Hours: 8
Microbial biotechnology: Scope and its applications in human therapeutics, agriculture (Biofertilizers, PGPR, Mycorrhizae), environmental, and food technology. Genetically engineered microbes for industrial application: Bacteria and yeast

UNIT- II No. of Hours: 7
Recombinant microbial production processes in pharmaceutical industries - Streptokinase, recombinant vaccines (Hepatitis B vaccine). Microbial polysaccharides, polyesters and bioplastics. Microbial production of bio-pesticides Microbial biosensors

UNIT- III No. of Hours: 10
Microbial based transformation of steroids and sterols. Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute. Immobilization methods and their application: Whole cell immobilization

UNIT- IV No. of Hours: 7
Bio-ethanol and bio-diesel production: commercial production from lignocellulosic waste and algal biomass. Biogas production: Methane and hydrogen production using microbial culture. Microorganisms in bioremediation: Degradation of xenobiotics. Mineral recovery, removal of heavy metals from aqueous effluents.

UNIT- V No. of Hours: 4
Outlines of Intellectual Property Rights: Patents, Copyrights, Trademarks

PRACTICAL-VI B: MICROBIAL BIOTECHNOLOGY
TOTAL HOURS: 36 **CREDITS: 2**
1. Yeast cell immobilization in calcium alginate gels

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- VI
PAPER-VII : FOOD AND INDUSTRIAL MICROBIOLOGY
TOTAL HOURS: 36 **CREDITS: 3**

UNIT- I No. of hours: 8
Intrinsic and extrinsic parameters that affect microbial growth in food Microbial spoilage of food - fruits, vegetables, milk, meat, egg, bread and canned foods Food intoxication (botulism). Food-borne diseases (salmonellosis) and their detection.

UNIT – II No. of hours: 7
Principles of food preservation - Physical and chemical methods. Fermented Dairy foods – cheese and yogurt. Microorganisms as food – SCP, edible mushrooms (white button, oyster and paddy straw). Probiotics and their benefits.

UNIT – III No. of hours: 6
Microorganisms of industrial importance – yeasts, moulds, bacteria, actinomycetes. Isolation and Screening of industrially-important microorganisms. Outlines of strain improvement.

UNIT – IV No. of hours: 8
Types of fermentation processes – solid state, liquid state, batch, fed-batch, continuous. Design of fermenter. Ingredients of Fermentation media Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.

UNIT – V No. of hours: 7
Microbial production of Industrial products - Citric acid, Ethanol, amylases, penicillin, glutamic acid and vitamin B12.

PRACTICAL-VII: FOOD AND INDUSTRIAL MICROBIOLOGY

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMISTER-VI
CLUSTER ELECTIVE
PAPER-VIII-A1 : COMPUTATIONAL METHODS AND BIOINFORMATICS

UNIT-1

A) Definition of statics, population and universe, the sample and population, statistical inference. Parameters and statistics. Internal data: Construction of histograms & interpretation. The normal distribution of mean, mode, median and standard deviation representing the normal curve, comparisons of means and variance.

B).Proportion data: examples of proportion data (MPN, sterility testingof medicines, animal toxicity, therapeutic, infection and immunization studies), Chi - square test, goodness of fit.

C) Count data: Examples of count data (bacteria cell count, radioactivity count, colony and plaque count) statistical treatment to count data:- Poisson distribution, standard error confidence limits of counts. (20hrs)

UNIT-II

A). Analysis of variance: Analysis of co-variance: introduction, procedure, t-Test and F-Test for multiple comparisons.

B)Correlation and regression and line fitting through graph points, standard curves, correlation, linear regression, MLR, multi-collinearity, standard curves and interpolation of unknown Y - values (15hrs)

UNIT-III

A) Computer fundamentals - organization and working of computers Basic definitions - hard ware and soft ware film ware, Program flowchart computer architecture fundamentals-internals, externals net work peripherals.

B) Introduction to windows 2000: Desktop files and folders: simple operations like creation deletion, moving, copying filesor folders using window explorer. Searching files and folders and other simple operations.

UNIT-IV

A) Word processing: opening, creating and saving documents, Typing, navigating, selecting, editing and sorting, checking spelling and grammar formatting - changing appearance of page - importing graphics, working with tables, documents printing. Basis of power point

B) Use of internet and working systems.

C) Microbiology applications of special software.

UNIT-V

A) Bioinformatics: Definition concept scope and relevance of bioinformatics Applications nbr genomics, proteomics, os databases.molecular modeling,drug designing, gene therapy, structure and functional relationship of biomolecules and other application of bioinformatics .

B) Sequence analysis: Concepts, importance and alignment methods, comparative, multiple sequence alingments and scoring methods.

C) Phylogenetic Analysis - concept evolution of p. trees gene predictions -methods , tools(GRAIL ,Genlang, gene tindu, procrutes, Gene panges, Prot.pred:- methods for knowing & unknowing folds modelling and drug designing.

PRACTICAL- VIII-A1 : COMPUTATIONAL METHODS AND BIOINFORMATICS
TOTAL HOURS: 36 **CREDITS: 2**

1. Introduction to Bioinformatics data bases: NCBI
2. Sequence retrieval using BLAST
3. Sequence alignment and Phylogenetic analysis using CLUSTAL W and Phylip
4. Pick out a given gene from genomes using Gene Scan or other softwares (Promotor region identification, repeat in genome ORF prediction). Gene finding tools (Glimmer, GENE SCAN), Primer designing, GENE SCAN/GENE TOOL
5. Protein structure: Primary structure analysis, Secondary structure prediction using PSI-PRED, Homology modeling using Swiss model

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMISTER-VI
PAPER-VIII-A2 : BIOFERTILIZERS AND BIOPESTICIDES
TOTAL HOURS: 36 **CREDITS: 3**

UNIT – I No of Hours: 10
General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers. Symbiotic N2 fixers: *Rhizobium* - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants *Frankia* from non-legumes and characterization. Cyanobacteria from *Azolla*, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

UNIT – II No of Hours: 6
Free living *Azospirillum*, *Azotobacter* - isolation, characteristics, mass inoculum production and field application.

UNIT – III No of Hours: 6
Phosphate solubilizing microbes - Isolation, characterization, mass inoculum production, field application

UNIT – IV No of Hours: 7
Importance of mycorrizal inoculum, types of mycorrhizae and associated plants, Mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM.

UNIT – V No of Hours: 7
General account of microbes used as bioinsecticides and their advantages over synthetic pesticides. *Bacillus thuringiensis* - production, Field applications. Viruses – NPV cultivation and field applications.

PRACTICAL-VIII-A2: BIOFERTILIZERS AND BIOPESTICIDES
TOTAL HOURS: 36 **CREDITS: 2**
1. Isolation of *Rhizobium* from root nodules.
3. Isolation of phosphate solubilizers from soil
4. Staining and observation of VAM
3. A visit to biofertilizer production unit.

SUGGESTED READINGS
Agarwal SK (2005) **Advanced Environmental Biotechnology**, APH publication.
Kannaiyan, S. (2003). **Bioetchnology of Biofertilizers,** CHIPS, Texas.
Mahendra K. Rai (2005). **Hand book of Microbial biofertilizers**, The Haworth Press, Inc. New York.
Reddy, S.M. et. al. (2002). **Bioinoculants for sustainable agriculture and forestry**, Scientific Publishers.
Saleem F and Shakoori AR (2012) **Development of Bioinsecticide,** Lap Lambert Academic Publishing GmbH KG
Subba Rao N.S (1995) **Soil microorganisms and plant growth** Oxford and IBH publishing co. Pvt. Ltd. NewDelhi.

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- VI
PAPER-VIII-A3: MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES

TOTAL HOURS: 36 **CREDITS: 3**

UNIT – I No. of Hours: 8
Good laboratory practices - Good microbiological practices. Biosafety cabinets – Working of biosafety cabinets, using protective clothing, specification for BSL-1, BSL-2, BSL-3. Discarding biohazardous waste – Methodology of Disinfection, Autoclaving & Incineration

UNIT – II No. of Hours: 8
Culture and microscopic methods - Standard plate count, Most probable numbers, Direct microscopic counts, Biochemical and immunological methods: Limulus lysate test for endotoxin, gel diffusion, sterility testing for pharmaceutical products

UNIT – III No. of Hours: 8
Molecular methods - Nucleic acid probes, PCR based detection, biosensors.

UNIT – IV No. of Hours: 8
Enrichment culture technique, Detection of specific microorganisms - on XLD agar, *Salmonella Shigella* Agar, Manitol salt agar, EMB agar, McConkey Agar, Saboraud Agar Ascertaining microbial quality of milk by MBRT, Rapid detection methods of microbiological quality of milk at milk collection centres (COB, 10 min Resazurin assay).

UNIT – V No. of Hours: 4
Hazard analysis of critical control point (HACCP) - Principles, flow diagrams, limitations Microbial Standards for Different Foods and Water – BIS standards for common foods and drinking water.

PRACTICAL-VIII-A3: MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES

TOTAL HOURS: 36 **CREDITS: 2**

1. Microbiological laboratory safety- General rules & Regulations.
2. Sterility tests for Instruments – Autoclave & Hot Air Oven
3. Disinfection of selected instruments & Equipments
4. Sterility of Air and its relationship to Laboratory & Hospital sepsis.
5. Sterility testing of Microbiological media
6. Sterility testing of Pharmaceutical products –Antibiotics, Vaccines & fluids
7. Standard qualitative analysis of water.
8. Quantitative analysis of water – Membrane filter method
9. Analysis of food samples for Mycotoxins

B.Sc. PHYSICS SYLLUBUS UNDER CBCS

w.e.f. 2015-16 (Revised in April 2016)

For Mathematics Combinations

Paper III: Wave Optics
(For Maths Combinations)
III SEMESTER

Work load:60 hrs per semester **4 hrs/week**

UNIT-I (8 hrs)

1. Aberrations:

Introduction – monochromatic aberrations - spherical aberration, coma, astigmatism, curvature of field and distortion- explanation and methods of elimination, Chromatic aberration - the achromatic doublet. Achromatism for two lenses (i)in contact and (ii) separated by a distance.

UNIT-II (14hrs)

2. Interference

Principle of superposition, coherence, conditions for interference of light. Fresnel's biprism-determination of wavelength of light, change of phase on reflection. Oblique incidence of a plane wave on a thin film due to reflected light (cosine law), colors of thin films, Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire, Newton's rings in reflected light. Michelson interferometer - Determination of wavelength of monochromatic light using Newton's rings and Michelson Interferometer.

UNIT-III (14hrs)

3. Diffraction

Introduction,distinction between Fresnel and Fraunhoffer diffraction, Fraunhoffer diffraction –Diffraction due to (i) single slit, (ii) double slit and (iii) N slits (diffraction grating), Resolving power of grating, Determination of wavelength of light in normal incidence and minimum deviation methods using diffraction grating,

Fresnel's half period zones - area of the half period zones, zone plate – construction and theory, comparison of zone plate with convex lens - difference between interference and diffraction.

UNIT-IV(10 hrs)

4.Polarisation:

Polarized light: methods of polarization polarization by reflection, refraction, double refraction, scattering of light, Brewster's law, Malus law, Nicol prism - polarizer and analyzer, Quarter wave plate, Half wave plate, optical activity- determination of specific rotation by Laurent's half shade polarimeter, Babinet's compensator.

UNIT-V (14hrs)

5. Lasers :

Lasers: introduction, spontaneous emission, stimulated emission. Population inversion, Laser principle, Einstein coefficients, Types of lasers - He-Ne laser and Ruby laser, Applications of lasers.

6. Fiber Optics

Introduction- different types of fibers, rays and modes in an optical fiber, fiber material, principles of fiber communication (qualitative treatment only), advantages of fiber optic communication.

Paper IV: Thermodynamics &Radiation Physics
(For Maths Combinations)
IV SEMESTER

Work load: 60 hrs per semester **4 hrs/week**

UNIT-I (10 hrs)

1. Kinetic theory of gases

Introduction, Deduction of Maxwell's law of distribution of molecular speeds, experimental verification. Transport phenomena - Viscosity of gases - thermal conductivity and diffusion of gases.

UNIT-II(12 hrs)

2. Thermodynamics

Introduction, Isothermal and adiabatic processes, Reversible and irreversible processes, Carnnot's engine and its efficiency, Carnot's theorem, Second law of thermodynamics - Kelvin's and Claussius statements, Entropy - physical significance – Change in entropy in reversible and irreversible processes, Entropy of Universe, Temperature-Entropy (T-S) diagram and its uses - Change of entropy of a perfect gas.

UNIT-III(12 hrs)

3. Thermodynamic potentials and Maxwell's equations

Thermodynamic potentials, Derivation of Maxwell's thermodynamic relations, Clausius-Clayperon's equation, Derivation for ratio of specific heats, Derivation for difference of two specific heats for perfect gas, Joule Kelvin effect - expression for Joule Kelvin coefficient for perfect and Vander waal's gas.

UNIT-IV(12 hrs)

4. Low temperature Physics

Introduction, Joule Kelvin effect - Porous plug experiment, Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling, Liquefaction of helium, Kapitza's method, Adiabatic demagnetization- Production of low temperatures, applications of substances at low temperature.

UNIT-V(14 hrs)

5. Quantum theory of radiation

Blackbody-Ferry's black body, distribution of energy in the spectrum of black body, Wein's law, Rayleigh-Jean's law, Quantum theory of radiation- Planck's law, Types of pyrometers- Disappearing filament optical pyrometer - experimental determination, Angstrom pyroheliometer - determination of solar constant, Temperature of Sun.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. Thermodynamics, R.C.Srivastava, S.K.Saha& Abhay K.Jain, Eastern Economy Edition.
3. Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath&Co.Ltd., Meerut
4. Fundamentals of Physics. Halliday/Resnick/Walker.C. Wiley India Edition 2007
5. Heat, Thermodynamics and Statistical Physics-N Brij Lal, P Subrahmanyam, PS Hemne, S.Chand& Co.,2012
6. Heat and Thermodynamics- MS Yadav, Anmol Publications Pvt. Ltd, 2000

Paper V: Electricity, Magnetism& Electronics
(For Maths Combinations)
V Semester

Work load: 60 hrs per semester **4 hrs/week**

UNIT-I (12 hrs)

1. **Electric field intensity and potential:**
   Gauss's law statement and its proof- Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge. Electrical potential – potential due to i) a point charge, ii) charged spherical shell, Equipotential surfaces.
2. **Dielectrics:**
   Electric dipolemoment and molecular polarizability- Electric displacement D, electric polarization P – relation between D, E and P- Dielectric constant and susceptibility.

UNIT-II (12 hrs)

3. **Electric and magnetic fields**
   Biot-Savart's law, explanation and calculation of B due to long straight wire and solenoid, Hall effect – determination of Hall coefficient and applications.
4. **Electromagnetic induction**
   Faraday's laws, Lenz's law, Self and mutual inductances, coefficient of coupling, calculation of self inductance of a long solenoid, Energy Stored in magnetic field , Transformer - energy losses - efficiency.

UNIT-III (12 hrs)

5. **Alternating currents and electromagnetic waves**
   Alternating current - Relation between current and voltage in LR and CR circuits - vector diagrams, LCR series and parallel resonant circuits, Q –factor.
6. **Maxwell's equations**
   Idea of displacement current - Maxwell's equations (integral and differential forms) (no derivation), Maxwell's wave equation (with derivation), Transverse nature of electromagnetic waves, production of electromagnetic waves (Hertz experiment).

UNIT-IV (12 hrs)

7. **Basic electronics:**
   PN juction diode and Zener diode - I-V characteristics, PNP and NPN transistors, CB, CE and CC configurations, transistor (CE) characteristics, Determination of hybrid parameters, Transistor as an amplifier.

UNIT-V: (12 hrs)

8. **Digital electronics :**
   Number systems - Conversion of binary to decimal system and vice versa, Laws of Boolean algebra, De Morgan's laws - statement and proof, Basic logic gates, NAND and NOR as universal gates, exclusive-OR gate, Half and full adders.

Paper VI: Modern Physics
(For Maths Combinations)
V Semester

Work load: 60 hrs per semester **4 hrs/week**

UNIT-I (12 hrs)

1. **Atomic and molecular physics**

   Introduction, Drawbacks of Bohr's atomic model, Sommerfeld's elliptical orbits - relativistic correction (no derivation). Vector atom model- quantum numbers associated with it, Stern-Gerlach experiment, Zeeman effect and its experimental arrangement.

   Raman effect - hypothesis, Stokes and Anti Stokes lines, Quantum theory of Raman effect, Experimental arrangement, Applications of Raman effect.

UNIT-II (12 hrs)

2. **Matter waves & Uncertainty Principle**

   Matter waves, de Broglie's hypothesis - wavelength of matter waves, Properties of matter waves, Davisson and Germer experiment.

   Heisenberg's uncertainty principle for position and momentum (x and p), energy and time (E and t). Experimental verification.

UNIT-III (12 hrs)

3. **Quantum (wave) mechanics**

   Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations - derivations. Physical interpretation of wave function, Application of Schrodinger wave equation to particle in one dimensional potential infinite box.

UNIT-IV(12 hrs)

4. **General Properties of Nuclei**

   Basic ideas of nucleus - size, mass, charge, density, angular momentum, magnetic moment, electric quadrupole moments, binding energy of nucleus, Liquid drop model and Shell model (qualitative aspects only).

5. **Radioactivity decay:**

   Alpha decay: α-decay - Gamow's theory, Geiger Nuttal law, β-decay- electron emission, positron emission, electron capture and neutrino hypothesis of β-decay.

UNIT-V (12 hrs)

6. **Crystal Structure**

   Amorphous and crystalline materials, unit cell, Miller indices, Bragg's law , diffraction of X-rays by crystals- experimental techniques of Laue's method and powder diffraction method.

7. **Superconductivity:**

   Introduction, experimental facts, critical temperature, critical field, Meissner effect, Isotope effect , Type I and type II superconductors, applications of superconductors.

Semester –V1

Elective Paper –VII-(A): Analog and Digital Electronics

No. of Hours per week: 04 **Total Lectures:60**

Unit-I (14 Hours)

1. **FET**-Advantages of FET over BJT ,FET-Construction, Working, characteristics and uses; MOSFET-enhancement MOSFET, depletion MOSFET, construction and working , drain and transfer characteristics of MOSFET, applications of MOSFET.

Unit-II (12Hours)

2. **Operational Amplifiers**: Characteristics of ideal and practical Op-Amp (IC 741), Basic differential amplifiers, Op-Amp supply voltage, IC identification, Internal blocks of Op-Amp, its parameter -off set voltages and currents, CMRR, slew rate.

Unit-III (12 Hours)

3. **Applications of Op-Amp**: Op-Amp as voltage amplifier, Inverting amplifier, Non-inverting amplifier, voltage follower, summing amplifier, difference amplifier, comparator, integrator, differentiator.

Unit-IV(10 Hours)

4. **IC 555 Timer** -Its pin diagram,internal architecture, Application as astable-multivibrator and mono stable multivibrator, Applications of mono stable multivibrator-a) frequency divider b) pulse stretcher, Applications of astable multivibrator-a) square wave oscillator b)Free-running ramp generator .

Unit-V (12 Hours)

5. **Sequential digital circuits**: Flip-flops, RS, Clocked SR, JK, D, T, Master-Slave Flip-flops, Conversion of Flip flops.

Reference Books

1. Digital Electronics by G.K.Kharate Oxford University Press
2. Unified Electronics by Agarwal and Agarwal. Vol I,II&III
3. Op- Amp and Linear ICs by Ramakanth A Gayekwad, 4th edition PHI
4. Digital Principles and Applications by Malvino and Leach, TMH, 1996, 4th edition.
5. Digital Circuit design by Morris Mano,PHI
6. Switching Theory and Logic design by A.AnandKumar ,PHI
7. operations amplifier by SV Subramanyam.

Elective Paper-VII Practical: Analog and Digital Electronics

2hrs/Week

Minimum of 6 experiments to be done and recorded

1) Characteristics of FET
2) Characteristics of MOSFET
3) Characteristics of Op-amp.(IC741)
4) Op-Amp as amplifier/inverting amplifier
5) Op-Amp as integrator/differentiator
6) Op-Amp as summing amplifier/difference amplifier
7) IC 555 as astable multivibrator
8) IC 555 as monostable amplifier
9) Master slave flip-flop

Semester –VI
Cluster Electives VIII-A
Paper – VIII-A-1: Electronic devices and circuits

No. of Hours per week: 04 **Total Lectures : 60**

UNIT-I : (10hrs)

1.Networks Theorems:

Statement and proofs of Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power transfer theorem, Milliman's theorem and Reciprocity theorem.

UNIT-II : (12 hrs)

2.UJT & SCR:

UJT construction-working, V-I characteristics, Experimental determination of UJT parameters, UJT as a Relaxation oscillator.

Silicon Controlled Rectifier (SCR), Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics, Application of SCR for power control.

UNIT-III : (12 hrs)

3.Rectifiers and Power Supplies :

Half wave, full wave and bridge rectifiers-Efficiency-ripple factor- Regulation, Types of filter-choke input(inductor) filter, L-section & π-section filters. Three terminal fixed voltage I.C(78 XX). regulators - Principle and working of SMPS(switch mode power supplies).

UNIT-IV : (12hrs)

4.Photo electric devices: Structure and operation, characteristics, spectral response and application of photo diode, multiple junction photo diode, LDR and LED, Photovoltaic cell.

Unit– V (14 Hours)

5. CRO : Block diagram of basic CRO, construction of CRT, electron gun, electrostatic focusing and acceleration(only explanation) , time base operation, synchronization, front panel controls.

6. Applications CRO: Measurements of dc and ac voltages, ac frequency, time period, special features of dual trace.

REFERENCE BOOKS:

1. Electric Circuit Analysis- **S.R. Paranjothi**- New Age International.

2. Networks and Systems – **D.Roy Chowdary.**

3. Unified Electronics (Circuit Analysis and Electronic Devices) **by Agarwal-Arora.** Vol- I

4. A text book in electrical technology by B.L.Thereja (S.Chand&Co).Vol- IV

5. Electronic devices and circuits by Milman and Halkias.

Semester –VI

Cluster Elective Paper VIII-A-2: Computational Methods and Programming

No. of Hours per week: 04 **Total Lectures:60**

UNIT-I (12hrs)

1. **Fundamentals of C language**: C character set-Identifiers and Keywords-Constants - Variables-Data types-Declarations of variables-Declaration of storage class-Defining symbolic constants- Assignment statement.
2. **Operators**: Arithmetic operators-Relational operators-Logic operators-Assignment operators- Increment and decrement operators-Conditional operators.

UNIT-II (12hrs)

3. **Expressions and I/O Statements**: Arithmetic expressions-Precedence of arithmetic operators-Type converters in expressions-Mathematical (Library) functions - Data input and output-The getchar and putchar functions-Scanf-Printf simple programs.

UNIT-III (12hrs)

4. **Arrays**: One dimensional and two dimensional arrays - Initialization - Type declaration - Inputting and outputting of data for arrays - Programs of matrices addition, subtraction and multiplication

UNIT-IV (12hrs)

5. **Linear and Non - Linear equations**: Solution of Algebra and transcendental equations-Bisection, Falsi position and Newton-Rhapson methods-Basic principles-Formulae-algorithms

UNIT-V (12hrs)

6.**Numerical differentiation and integration**: Numerical differentiation-algorithm for evaluation of first order derivatives using formulae based on Taylor's series-Numerical integration-Trapezoidal and Simpson's 1/3 rule- Formulae-Algorithms.

Semester –VI

Cluster Elective Paper –VIII-A-3: Electronic Instrumentation

No. of Hours per week: 04 **Total Lectures:60**

Unit – I (12Hours)

1. **Basics of measurements**: Instrument, accuracy, precision, sensitivity, resolution, range, errors in measurement, Multi meter - principle- measurement of dc voltage and dc current, ac voltage and resistance, Operating instructions of multi meter.

Unit -11 (10 Hours)

2. **Electronic Voltmeter**: Advantages over conventional multi meter, considerations in selecting voltmeter, Basic volt meter (TVM), Differential voltmeter, Solid state voltmeter AC voltmeter using rectifiers and their significances.

Unit– III (14 Hours)

3. **Digital Multi meter**: Block diagram, working and specifications of digital multi meter, Universal counter and Frequency counter- Block diagram, frequency and time period measurement & accuracy and resolution.

Unit – IV (12 Hours)

4. **Digital instruments**: Comparision of analog and digital instruments, Principle and working of digital instruments - Tacho meter, P^H meter, Capacitance meter and phase meter. Digital voltmeter- advantages, Performance parameters, Block diagram and working.

Unit – V (12 Hours)

5. **Signal generators**: Block diagram explanation, specifications of low frequency signal generators(AF Sine and square wave generator, RF Signal Generator), pulse generator, function generator-working, Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Reference Books

1. A text book in electrical technology by B.L.Thereja (S.Chand&Co)-Vol IV
2. Digital circuits and systems by Venugopal 2011 (Tata Mcgraw Hill)
3. Digital Electronics by SubrathaGhoshal 2012 (Cengage Learning)
4. Electronic measurements and instrumentation by U.A.Bakshi, A.V.Bakshi K.A.Bakshi
5. Electronic instrumentation by H. S. Kalsi.

YOGI VEMANA UNIVERSITY: KADAPA

STATISTICS SYLLABUS

Semester – III (CBCS With Maths Combination Common to BA/BSc)

Paper - III : Statistical Methods and Sampling Distributions

No. of Hours/week : 04 credits 3

UNIT – I

Curve fitting: Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line (), Fitting of Second degree polynomial or parabola (), Fitting of power curve () and exponential curves of type i) and ii) with problems.

UNIT – II

Correlation : Meaning, Types of Correlation, Measures of Correlation : Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Correlation ratio, concept of multiple and partial correlation coefficients (three variables only) and properties

UNIT – III

Regression : Concept of Regression, Linear Regression: Regression lines, Regression coefficients and it's properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression. concept of multiple linear regression and partial regression.

UNIT – IV

Attributes : Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency ofdata. Conditions for consistency of data for 2 and 3 attributes only , Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingency table: Square contingency(), Mean square contingency(2), Coefficient of mean square contingency (C), Tschuprow's coefficient of contingency (

UNIT – V

Exact Sampling distributions: Population, Sample, Parameter, statistic, Sampling distribution, Standard error. Definition and properties of Student's t- distribution, F – Distribution, - Distribution and their applications, the relationship between t and F – distribution and the relationship between F and distribution.

Text books

1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A. Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kum.

YOGI VEMANA UNIVERSITY: KADAPA

STATISTICS SYLLABUS

Semester – IV (CBCS With Maths Combination Common to BA/BSc)

Paper - IV: Statistical Inference

(Scientific calculators are allowed)

No. of Hours/week : 04

UNIT-I

Theory of estimation: Estimation of a parameter, criteria of a good estimator – unbiase consistency, efficiency, &sufficiency and. Statement of Neyman's factorization the Estimation of parameters by the method of moments and maximum likelihood (properties of MLE's. Binomial, Poisson &Normal Population parameters estimate by method. Confidence intervals of the parameters of normal population.

UNIT-II

Testing of Hypothesis: Concepts of statistical hypotheses, null and alternative hypot region, two types of errors, level of significance and power of a test. One and two tailed te Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distrib

UNIT – III

Large sample Tests: large sample test for single mean and difference of two mean intervals for mean(s). Large sample test for single proportion, difference of proporti deviation(s) and correlation coefficient(s).

UNIT – IV

Small Sample tests: t-test for single mean, difference of means and paired t-test. $\chi 2$-test of fit and independence of attributes. F-test for equality of variances.

UNIT – V

Non-parametric tests- their advantages and disadvantages, comparison with para Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test a signed rank tests (single and paired samples). Two independent sample tests: Median tes Mann-Whitney U test, Wald Wolfowitz's runs test.

TEXT BOOKS

1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. RavichandraKumar.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

YOGI VEMANA UNIVERSITY: KADAPA

STATISTICS SYLLABUS

Semester – V (CBCS With Maths Combination Common to BA/BSc)

Paper - V: SAMPLING THEORY and DESIGN OF EXPERIMENTS

No. of Hours/week : 04 credits 3

UNIT –I

Sampling Theory: Principal steps in sample surveys - census versus sample survey, sampling and non- sampling errors, advantages of sampling over census and limitations of sampling. Types of sampling: Subjective, probability and mixed sampling methods.

UNIT– II

Simple Random Sampling: Simple random sampling , selection procedure of simple random sampling, Advantages and Disadvantages of simple random sampling. Estimation of population mean, population total and variance of these estimates by Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR.

UNIT – III

Stratified random sampling: Stratified random sampling, Advantages and Disadvantages of Stratified Random sampling, Estimation of population mean, and its variance. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.

Systematic sampling : Systematic sampling definition when N = nk and merits and sdemerits of systematic sampling - estimate of mean and its variance. Comparison of systematic sampling with Stratified and SRSWOR.

UNIT – IV

Analysis of variance : Analysis of variance(ANOVA) –Definition and assumptions. One-way with equal and unequal classification, Two way classification.

Design of Experiments: Definition, Principles of design of experiments, CRD: Layout, advantages and disadvantage and Statistical analysis of Completely Randomized Design (C.R.D).

UNIT –V

Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts and Analysis, Missing plot technique in RBD and LSD. Efficiency RBD over CRD, Efficiency of LSD over RBD and CRD. Factorial experiments – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effect totals.

Text Books:

1. Telugu AcademyBA/BSc III year paper - III Statistics - applied statistics - Telugu academy by Prof.K.Srinivasa Rao, Dr D.Giri, Dr A.Anand, Dr V.Papaiah Sastry.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference Books:

1. Fundamentals of applied statistics : VK Kapoor and SC Gupta.
2. Indian Official statistics - MR Saluja.
3. Anuvarthita Sankyaka Sastram - Telugu Academy.

YOGI VEMANA UNIVERSITY: KADAPA

STATISTICS SYLLABUS

Semester – V (CBCS With Maths Combination Common to BA/BSc)

Paper – VI : Statistical Quality Control and Reliability

No. of Hours/week :04 credits

UNIT – I

Statistical Quality Control : Definition, Importance of SQC in industry. Causes of variation-chanc and assignable causes, Process and Product control, Importance of Normal distribution and 3σ control limits, specification limits and Natural tolerance limits.

UNIT– II

Shewart control charts – Variable Control Charts- and R-chart, and S- chart. Attribute type of charts - np- chart(No of defectives), p- chart(Proportion of defectives) with fixed and variable sample size and C-Chart(No. of defects per unit), its applications.

UNIT – III

Acceptance sampling plans: Definition, Types of Accepting sampling plans, Merits and demerits of Acceptance sampling plans, applications, Concept of, AQL and LTPD, Producers risk and Consumer's risk. AOQ and AOQL curves, OC , ASN, and ATI curves.

UNIT – IV

Single and Double sampling plans for attributes and derivation of their OC and ASN functions. Design of single and double sampling plans for attributes.

UNIT – V

Reliability: Meaning and concept of reliability, Reliability measures –Failure Density, Failure Ra or Hazard function, Probability of Failure, Mean Time to Failure(MITF), Mean Time Betwee Failures(MTBF), Exponential distribution as life model, its memory- less property.

List of reference books :

1. Fundamentals of Applied Statistics. By V.K.Kapoor and S.C.Gupta , Sultan Chand.
2. Reliability and life testing by S.K.Sinha. Wiley Eastern
3. Statistical Quality Control by R.C.Gupta:
4. B.A/B.Sc III Year Paper-IV Statistics- applied Sttistics- Telugu Academic by Prof.K.Srinivas RAo. Dr.D. Giri. Dr.A.Anand. Dr. V.Papaiah Sastry
5. B.A/B.Sc Statistics Paper-IV Statistics, Quality, Reliability and OR by DVLN Jogiraju. C.Srikala. Palnati Sudarsan.

YOGI VEMANA University: KADAPA

STATISTICS MODEL QUESTION PAPER

Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VII: ECONOMIC STATISTICS

No. of Hours/week : 04 credits 3

UNIT-I

Time Series: Time Series and its components with illustrations, additive, multiplicative models. Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method. Determination of seasonal indices by simple averages method, ratio to moving average, Ratio to trend and Link relative methods.

UNIT-II

Growth curves: Modified exponential curve, Logistic curve and Grompertz curve, fitting of growth curves by the method of three selected points and partial sums.

UNIT-III

Index numbers: Concept, construction, problems involved in the construction of index numbers, uses and limitations. Simple and weighted index numbers. Laspayer's, Paasche's and Fisher's index numbers, Criterion of a good index number, Fisher's ideal index numbers. Fixed and chain base index numbers. Cost of living index number and wholesale price index number. Base shifting, splicing and deflation of index numbers.

UNIT-IV

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

UNIT-V

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics. Mortality rates: Crude death rate(CDR), Specific death rate(SDR), standardized death rate(STDR). Fertility rates: crude birth rate(CBR), age specific fertility rate(ASFR), general fertility rate(GFR), total fertility rate(TFR). Measurement of population growth: crude rate of natural increase and pearl's vital index, Gross reproduction rate(GRR) and net reproduction rate(NRR). Life tables: construction and uses of life tables and abridged life tables.

Text Books:

1. Fundamentals of applied statistics : VK Kapoor and SC Gupta.
2. BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof.K.Srinivasa Rao, Dr D.Giri, Dr A.Anand, Dr V.Papaiah Sastry.

YOGI VEMANA UNIVERSITY: KADAPA
STATISTICS SYLLABUS
Semester – VI (CBCS With Maths Combination Common to BA/BSc)
Paper – VIII(A2) : Numerical Methods

No. of Hours/week : 04 Credits 3

UNIT-I

Definitions of Forward difference operator(Δ), Backward difference operator(), Shift or Extension(displacement) operator (E), Central Differences operator(μ), Differentiation operator(D), Mean value operator (Symbolic relations between operators, properties of difference and shift operators, fundamental theorem on finite differences and simple problems.

UNIT-II

Interpolation with equal intervals: Concept of interpolation and extrapolation, assumptions and uses of interpolation, difference tables, methods of interpolation with equal intervals - Newton's formula for forward and backward interpolation, Central differences, Gauss forward and backward, Sterling, Bessel's and Lalace-Everett's Formulae,

UNIT-III

Interpolation with unequal intervals: Divided differences and their properties. Methods of interpolation with unequal intervals – Newton's Divided difference formula and Lagrange's formula. Inverse interpolation- Lagrange's formula.

UNIT-IV

Numerical Differentiation: Introduction to Numerical differentiation. Determination of First and Second order derivatives for the given data using Newton's forward and backward, Gauss forward and backward, Sterling, Bessel's and Newton's Divided difference formula.

UNIT-V

Numerical Integration: Introduction to numerical integration, General Quadrature formula for equidistant ordinates, Trapezoidal rule, Simpson's 1/3 rd, Simpson's 3/8 th rule and Weddle's rule.

Books Recommended:

1. H.C. Saxena, Finite Differences and Numerical Analysis, S. Chand and Company, NewDelhi.
2. P.P.Gupta, G.S.Malik and Sanjay Gupta, Calculus of Finite Differences and Numerical Analysis, Krishna Prakashan Media(P) Ltd., Meerut(UP), India.
3. S.Ranganatham, M.V.S.S.N Prasad, V.Ramesh Babu, S.Chand& Company Ltd.
4. S. S. Sastry, Introductory Methods Numerical Analysis, Prentice- Hall of India.
5. C.F. Gerald and P. O. Wheatley, Applied Numerical Analysis, Addison- Wesley, 1998.

YOGI VEMANA UNIVERSITY: KADAPA
STATISTICS SYLLABUS
Semester – VI (CBCS With Maths Combination Common to BA/BSc)
Paper – VIII(A3) : Econometric Methods

No. of Hours/week : 04 Credits

UNIT-I

Basic Econometrics: Nature of econometrics and economic data, concept of econometrics, steps empirical economic analysis, econometric model, importance of measurement in economics, the structure econometric data, cross section, pooled cross section, time series and paired data, simple regression mod two variable linear regression model, assumptions estimations of parameters.

UNIT-II

Models and Estimations: Gauss marcoff theorem, OLS estimations, partial and multiple correlati coefficients. The general linear model assumptions, estimation and properties of estimators, BLUEs, a tests of significance of estimators, R square and ANOVA.

UNIT-III

Problems in OLS Estimators: Nature, test, consequences and remedial steps of problems heteroscedasticity; Multicollinearity and Auto-correlation; Problems of specification error; Errors measurement.

UNIT-IV

Regressions with Qualitative Independent Variables: Dummy variable technique — Testing structu stability of regression models comparing two regressions, interaction effects, seasonal analysis.

UNIT-V

Regressions with Qualitative Independent Variables: Piecewise linear regression, use of dum variables, regression with dummy dependent variables; The LPM, Logit, Probit and Tobit models Applications.

BASIC READING LIST

1. Amemiya, T. (1985), Advanced Econometrics, Harvard University Press, Cambridge, Mass.
2. Baltagi, B.H. (1998), Econometrics, Springer, New York.
3. Dongherty, C. (1992), Introduction to Econometrics, Oxford University Press, New York.
4. Goldberger, A.S. (1998), Introductory Econometrics, Harvard University Press, Cambridge, Mass.
5. Gujarati, D.N. (1995), Basic Econometrics (6th Edition), McGraw Hill, New Delhi.
6. Hill R. C., E.G. William and G.G. Judge (1997), Undergraduate Econometrics, Wiley, New York.
7. Kennedy. P. (1998), A Guide to Econometrics (4th Edition), MIT Press, New York.

ZOOLOGY SYLLABUS FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Periods:60 Max. Marks:100

Unit - I

1. Cytology - I

Definition, history, prokaryotic and eukaryotic cells, virus

Electron microscopic structure of eukaryotic cell.

Plasma membrane –Different models of plasma membrane.

Unit – II

2. Cell organelles

Structure and functions of Endoplasmic Reticulum

Structure and functions of Golgi apparatus

Structure and functions of Lysosomes

Structure and functions of Ribosomes

Structure and functions of Mitochondria

2.7. Chromatin, Chromosomes - Structure, types, functions

Unit - III

Genetics - I

Mendel's work on transmission on traits

Principles of inheritance

Incomplete dominance and codominance

Lethal alleles, Epistasis, Pleiotropy

Unit - IV

Genetics - II

Sex determination

Sex linked inheritance

Linkage and crossing over

Extra chromosomal inheritance

Human karyotyping

Unit - V

Evolution

Lamarckism, Darwinism, Hardy-Weinberg Equilibrium.

Variations, isolating mechanisms, natural selection

Speciation (Allopatric and Sympatric)

Macro evolutionary principles (Example: Darwin's finches)

ZOOLOGY SYLLABUS FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods:60 Max. Marks: 100

Unit - I

Developmental Biology and Embryology

Gametogenesis

Types of eggs

Formation and functions of Foetal membrane in chick embryo

Development, types and functions of Placenta in mammals

Unit - II

Physiology - I

Elementary study of process of digestion

Absorption of digested food

Respiration - Pulmonary ventilation, transport of oxygen and carbondioxide

Circulation - Structure and functioning of heart, Cardiac cycle

Excretion - Structure of nephron, urine formation, counter current mechanism

Unit - III

Physiology - II

Nerve impulse transmission, origin and propagation of action potentials

Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction

Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas

Hormonal control of reproduction in a mammal

Unit - IV

Ecology - I

Meaning and scope of Ecology

Nutrient cycles - Nitrogen, carbon and phosphorus

Components of Ecosystem (Example:lake), food chains and food web, energy flow in ecosystem

Unit - V

Ecology - II

Habitat and ecological niche

Community interactions - Mutualism, commensalism, parasitism, competition, predation

Ecological succession

Zoogeography

Zoogeographical regions

Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian Regions

ZOOLOGY SYLLABUS FOR V SEMESTER

ZOOLOGY - PAPER - V

ANIMAL BIOTECHNOLOGY

Periods:60 Max. Marks:100

Unit 1: Tools of Recombinant DNA technology - Enzymes and Vectors

Restriction modification systems: Types I, II and III. Mode of action, nomenclature, applications of Type II restriction enzymes in genetic engineering

Cloning Vectors: Plasmid vectors:pBR and pUC series, Bacteriophage, Cosmids.

Unit 2 Techniques of Recombinant DNA technology

Cloning: Use of linkers and adaptors

PCR: Basics of PCR.

Hybridization techniques: Southern, Northern and Western blotting,

Genomic and cDNA libraries: Preparation and uses

UNIT 3 Animal Cell Technology

Cell cultures: primary culture, secondary culture, Organ culture; Cryopreservation of cultures.

Hybridoma Technology: Production of Monoclonal antibodies (mAb), Applications of mAb

Stem cells: Types of stem cells, applications of stem ell technology in cell based therapy.

Unit 4 Reproductive Technologies & Transgenic Animals

Manipulation of reproduction in animals: Artificial Insemination, In vitro fertilization , super ovulation, Embryo transfer

Transgenic Animals: Transgenic - sheep, - fish; applications

Unit 5 Applied Biotechnology

Industry: Fermentation: Different types of Fermentation: Short notes on - Submerged & Solid state; batch, Fed batch & Continuous;

Agriculture: fisheries – monoculture in fishes, polyploidy in fishes; DNA fingerprinting

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ZOOLOGY SYLLABUS FOR V SEMESTER

ZOOLOGY - PAPER - VI

ANIMAL HUSBANDRY

Periods:60 Max. Marks: 100

UNIT – I : 10 Hours

General introduction to poultry farming. Principles of poultry housing. Poultry houses. Systems of poultry farming. Management of chicks, growers and layers. Management of Broilers.

UNIT – II: 10 Hours

Poultry feed management – Principles of feeding. Methods of feeding. Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management.

UNIT – III: 10 Hours

Selection, care and handling of hatching eggs. Egg testing. Methods of hatching. Brooding and rearing. Sexing of chicks.

UNIT- IV: 20 Hours

Breeds of Dairy Cattle and Buffaloes – Definition of breed; Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds. (Three each category). Housing of dairy animals – Selection of site for dairy farm; systems of housing – loose, housing system. Conventional dairy barn. Cleaning and sanitation of dairy farm. Weaning of calf. Castration and dehorning. Deworming.

UNIT - V: 10 Hours

Care and management of dairy animals - Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks.

ZOOLOGY SYLLABUS FOR VI SEMESTER

ZOOLOGY –ELECTIVE PAPER:VII

IMMUNOLOGY

Periods:60 Max. Marks:100

Unit - I

Overview of Immune system

Introduction to basic concepts in Immunology

Innate and adaptive immunity

Cells and organs of Immune system

Cells of immune system

Organs of immune system

Unit - II

Antigens

Basic properties of antigens

B and T cell epitopes, haptens

Factors influencing immunogenicity

Unit - III

Antibodies

Structure of antibody

Classes and functions of antibodies

3.1.3Monoclonal antibodies

Unit - IV

Working of Immune system

Structure and functions of major histocompatibility complexes

Exogenes and Endogenes pathways of antigen presentation and processing

Basic properties and functions of cytokines

Unit - V

Immune system in health and disease

Classification and brief description of various types of hyper sensitivities

Introduction to concepts of autoimmunity and immunodeficiency

Vaccines

General introduction to vaccines

Types of vaccines

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VI SEMESTER

ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE –VIII-A:

AQUACULTURE

Cluster Elective Paper: VIII-A-1

PRINCIPLES OF AQUACULTURE

Periods:60 Max.Marks:100

Unit – I

Introduction / Basics of Aquaculture

Definition, Significance and History of Aquaculture

Major cultivable species for aquaculture: freshwater, brackish water and marine.

Criteria for the selection of species for culture

Unit – II

Types of Aquaculture

Freshwater, Brackishwater and Marine

Concept of Monoculture, Polyculture,Composite culture, Monosex culture and Integrated fish farming

Culture practices

Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish.

Unit – III

Design and construction of aquafarms

Criteria for the selection of site for freshwater and brackish water pond farms

Design and construction of fish and shrimp farms

Nutrition and feeds

Natural food and Artificial feeds and their importance in fish and shrimp culture

Unit – IV

Management of carp culture ponds

4.1.1 Culture of Indian major carps: Pre-stocking management – Dewatering, drying, ploughing/desilting; Predators, weeds and algal blooms and their control, Liming and fertilization; Stocking management – Stocking density and stocking; Post-stocking management – Feeding, water quality, growth and health care; and Harvesting ofponds

Unit – V

Culture of shrimp (Penaeus monodon or Litopenaeus vannamei)

Culture of pearl oysters

Culture of ornamental fishes – Setting up and maintenance of aquarium.

REFERENCES BOOKS

1. Bardach, JE et al. 1972. Aquaculture – The farming and husbandry of freshwater and marine organisms, John Wiley & Sons, New York.
2. Bose AN et al.1991. Coastal aquaculture Engineering. Oxford & IBH Publ.Co.Pvt.Ltd.
3. Chakraborty C & Sadhu AK. 2000. Biology Hatchery and Culture Technology of Tiger Prawn and Giant Freshwater Prawn. Daya Publ. House.
4. FAO. 2007. Manual on Freshwater Prawn Farming.
5. Huet J. 1986. A text Book of Fish Culture. Fishing News Books Ltd.
6. ICAR. 2006. Hand Book of Fisheries and Aquaculture. ICAR.
7. Ivar LO. 2007. Aquaculture Engineering. Daya Publ. House.
8. Jhingran V.G. 2007. Fish and Fisheries of India. Hindustan Publ. Corporation, India.
9. Landau M. 1992. Introduction to Aquaculture. John Wiley & Sons.
10. Lovell RT.1998. Nutrition and Feeding of fishes. Chapman & Hall.
11. Mcvey JP. 1983. Handbook of Mariculture. CRC Press.
12. MPEDA: Handbooks on culture of carp, shrimp, etc.
13. New MB. 2000. Freshwater Prawn Farming. CRC Publ.
14. Pillay TVR.1990. Aquaculture- Principles and Practices, Fishing News Books Ltd., London.
15. Pillay TVR & Kutty MN. 2005. Aquaculture- Principles and Practices. 2nd Ed. Blackwell
16. Rath RK. 2000. Freshwater Aquaculture. Scientific Publ.
14. Stickney RR. 1979. Principles of Warmwater Fish Culture, John Wiley & Sons
15. Wheaton FW. 1977. Aquacultural Engineering. John Wiley & Sons.

Cluster Elective Paper: VIII-A-2

AQUACULTURE MANAGEMENT

Periods : 60 Max.Marks : 100

Unit – I

Breeding and Hatchery Management

Bundh Breeding and Induced breeding of carp by Hypophysation; and use of synthetic hormones

Types of fish hatcheries; Hatchery management of Indian major carps

Breeding and Hatchery management of Penaeus monodon

Unit – II

Water quality Management

Water quality and soil characteristics suitable for fish and shrimp culture

Identification of oxygen depletion problems and control mechanisms in culture ponds

Liming materials, Organic manures and Inorganic fertilizers commonly used and their implications in fish ponds

Unit – III

Feed Management

Live Foods and their role in shrimp larval nutrition.

Supplementary feeds: Principal foods in artificial diets; Types of feeds; Feed additives and Preservatives; role of probiotics.

Feed formulation and manufacturing; Feed storage

Unit – IV

Disease Management

Principles of disease diagnosis and health management;

Prophylaxis, Hygiene and Therapy of fish diseases

Etiology, Symptoms, prophylaxis and therapy of common fish diseases in fish ponds

Unit – V

Economics and Marketing

5.1.1 Principles of aquaculture economics – Capital costs, variable costs, cost-benefit analysis

5.1.2Fish marketing methods in India; Basic concepts in demand and price analysis

Fish Genetics

Genetic improvement of fish stocks – Hybridization of fish.

Cryopreservation of gametes, Production of monosex and sterile fishes and their significance in aquaculture.

REFERENCE BOOKS

1. Boyd CE. 1979. Water Quality in Warm Water Fish Ponds. Auburn University
2. Boyd, CE. 1982. Water Quality Management for Pond Fish Culture. Elsevier Sci. Publ. Co.
3. Chakraborty C & Sadhu AK. 2000. Biology Hatchery and Culture Technology of Tiger Prawn and Giant Freshwater Prawn. Daya Publ. House
4. Conroy CA and Herman RL. 1968. Text book of Fish Diseases. TFH (Great Britain) Ltd, England.

Cluster Elective Paper: VIII-A-3

POST HARVEST TECHNOLOGY

Periods : 60 Max.Marks : 100

Unit – I

Handling and Principles of fish Preservation

Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage).

Principles of preservation– cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to lowradiation of gamma rays.

Unit – II

Methods of fish Preservation

Traditional methods - sun drying, salt curing, pickling and smoking.

Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, Irradiation and Accelerated Freeze drying (AFD).

Unit – III

Processing and preservation of fish and fish by-products

Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.

Fish by-products – fish glue, ising glass, chitosan, pearl essence, shark fins, fish leather and fish maws.

Unit – IV

Sanitation and Quality control

Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.

Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.

Unit – V

Quality Assurance, Management and Certification

Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety.

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