

SEMESTER – IV

BCH 19: Clinical Biochemistry

Unit I

The place of clinical Biochemistry in medicine, the use of **Biochemical tests and the clinical biochemistry laboratory, Specimen collection, reference values, Automation and autoanalyzers, quality assurance in clinical laboratory – internal and external quality control.**

Investigation of disorders of carbohydrate metabolism: **Hypoglycemia, Hyperglycemia. Diabetes mellitus** – classification, clinical and metabolic features and management. laboratory diagnosis of diabetes mellitus – glucose tolerance test (GTT), Random, Fasting, post prandial (PP) blood glucose levels, glycosuria, ketones, glycosylated hemoglobin (GHb), metabolic complications of diabetes – Diabetic keto acidosis (DKA), glycogen storage diseases,

Plasma proteins – functions and their alterations in disease, paraproteinemias.

Unit II

Kidney function: Formation of urine, Normal and abnormal constituents of urine, Glomerular and tubular function, renal function tests, nephrotic syndrome and CRF.

Liver function: structure and function of liver, liver function tests, Bilirubin metabolism and Jaundice, kernicterus, liver diseases - hepatitis, gall stones, cirrhosis.

Gastric and pancreatic function: Gastric function tests - Penta gastrin test, insulin stimulation test, hyper chlorhydria, achlorhydria, pancreatic diseases – acute pancreatitis, Malabsorption syndrome.

Unit III

Fluid and electrolyte balance – hyponatremia and hypernatremia, hyperkalemia, acid-base balance in the body fluids - Blood buffers, role of kidney and lungs, metabolic acidosis and alkalosis.

Plasma Lipids and lipoproteins and their functions – lipid profile, clinical disorder of lipid metabolism - hyperlipidemias and management, Atherosclerosis.

Molecular diagnosis – HIV, thalassemia, tumor markers. Cerebrospinal fluid analysis (CSF)

Unit IV

Plasma enzymes in diagnosis and prognosis: Transaminases (SGOT & SGPT), alkaline and acid phosphatase, lactate dehydrogenase (LDH), creatine kinase (CK), α -amylase, acid phosphatase, γ – glutamyl transferase, acetyl Cholinesterase, Isoenzymes of clinical importance, Plasma enzyme pattern in myocardial infarction, liver disease and muscle disease.

Inborn errors of amino acid metabolism - Phenylketonuria, alkaptonuria and Maple-Syrup urine disease.

Hemoglobinopathies.

Recommended Books

1. Text book of Biochemistry with Clinical Correlations. Thomas M. Devlin (John Wiley).
2. Harper's Review of Biochemistry, Murray *et al* (Longman) Investigation of lipoproteinemias and lipidemias. Renal function: Glomerular and tubular functions.
3. Biochemical Aspects of Human Disease – R.S. Elkeles and A.S. Tavit. (Blackwell Scientific Publications, 1993)
4. Clinical Chemistry in Diagnosis and Treatment – Joan F. Zilva and P.R. Pannall (Lloyd – Luke medical Books, London, (1988).
5. Varley's Practical Clinical Biochemistry – Ed. Alan W. Gowen Lock (Heinemann Medical Books, London (1988)
6. Clinical diagnosis and management by Laboratory Methods (John Bernard Henry, W.B Saunders Company, 1984)
7. Clinical Biochemistry – S. Ramakrishnan and Rajiswami.
8. Chemical Biochemistry (Metabolic and Clinical Aspects) by W.J. Marshall & S.K. Bangert.
9. Text book of Clinical Biochemistry by Tietz et al.

BCH 20: Immunology

Unit I

Lymphoid organs (primary and secondary), organization of immune system, Types of immunity – Natural and acquired, specific and non-specific immune response. Cells and organs of immune system, antigenic determinants/Epitopes. Haptens, adjuvants, classification, structure and biological functions of immunoglobulins, Isotypes, allotypes and idiotypes. Theories of antibody formation.

Unit II

Active and passive immunity, Humoral and cell mediated immune response, T-Cell and B-Cell activation. Antigen processing and presentation. T-Cell and B-Cell receptors, Complement system, Alternate and classical pathways of complement activation. Complement fixation tests. Cytokines. **Major histocompatibility complex (MHC).**

Unit III

Antigen-antibody interactions, precipitation reactions – immune diffusion, radial immunodiffusion, immunoelectrophoresis, immunofluorescence, **Western blotting, Hybridoma Technology**, Production of polyclonal and monoclonal antibodies and their application, RIA and ELISA.

Unit IV

Disorders of immune response – Hypersensitivity, Basic concepts, types of hypersensitivity, Autoimmune diseases – Hashimoto's thyroiditis, RA, **Immunodeficiencies – SCID, AIDS**. Cancer immune therapy. Graft rejection, HLA typing, Immunosuppressive drugs (cyclosporine, methotrexate, steroids).

Recommended Books:

1. Essential immunology – Ivan M. Roitt.
2. Immunology – a short course elibezamini and Sidney Leskowitz, Alan R. Lisi Inc. New York, 1988.
3. Immunology III, Joseph A. Bellanti Igaku – Shein Saunders International Ed. 1985.
4. Immunology at a glance J.H. L. Playfeir 4th Ed. Blackwell Scientific Publication 1987.
5. Acids to Immunology D.M. Wier Churchill, Livingtons 1986.
6. Fundamentals of Immunology, Myrvik and Weiser, 1984.
7. Fundamentals of Immunology, Bier *et al*, Springer 1986
8. Textbook of Biochemistry and Human Biology, Talwar G.P. Prentice Hall, 1980.
9. Basic and Clinical Immunology – Stites et al., 4th Ed. Lange 1982.
10. The Immuno-system, Mc Connell et al., Blackwell Scientific 1981.
11. Fundamentals of Immunology – William C. Boyed (Wiley Toppan)
12. Introduction to Immunology – John W. Kinball.
13. Fundamentals of Immunology – Otto S. View and others.
14. Immunology – D.M. Weir.
15. Immunology – Janis Kuby,
16. Cellular and Molecular Immunology 3rd, Abul K. Abbas, Andrew K. Kich Amn Jordan S. Pober

(B) Four-membered Heterocycles

Synthesis and chemical reactivity of azetidines, azetidinones (β -lactams), oxetanes, oxetanones (β -lactones) and thietanes.

UNI – III: Five-membered Heterocyclic Compounds with Two Heteroatoms**15 Hrs**

Synthesis, chemical reactivity and medicinal applications of pyrazoles, imidazoles, oxazoles, isoxazoles, thiazoles and isothiazoles.

UNIT – IV: Benzofused Five- and Six-membered Heterocyclic Compounds**15 Hrs****(A) Benzofused Five Membered Heterocycles**

Synthesis, chemical reactivity and medicinal applications of benzopyrroles, benzofurans, benzothiophenes and benzimidazoles.

(B) Benzofused Six Membered Heterocycles

Synthesis, chemical reactivity and medicinal applications of quinolines and Isoquinolines.

Books Suggested:

1. Heterocyclic Chemistry Vol.1-3, R. R. Gupta, M. Kumar and V. Gupta, Springer Verlag
2. The Chemistry of Heterocycles, T. Eicher and S. Hauptmann, Thieme
3. Heterocyclic Chemistry, J.A. Joule, K. Mills and G. F. Smith, Chapman and Hall
4. Heterocyclic Chemistry, T.L. Gilchrist, Longman Scientific Technical
5. Heterocyclic Chemistry, Raj.K. Bansal.
6. An Introduction to the Heterocyclic Compounds, R. M. Acheson, John Wiley.
7. Comprehensive Heterocyclic Chemistry, A. R. Katritzky and C. W. Rees, eds., Pergamon Press
8. Principles of Modern Heterocyclic Chemistry, L. A. Paquet.
9. Enzyme structure and mechanism by Fersht and Freeman.
10. Bio-Organic chemistry by Henna Dugas
11. Nucleic acids in Chemistry and Biology by G M Blackburn MI Gait
12. Lehninger Principles of Biochemistry by D L Nelson and M M Cox.

45034: MEDICINAL CHEMISTRY AND NATURAL PRODUCTS**UNIT – I: Basic Principles of Pharmacology****UNIT – II: Drug Design, Lead Modification and SAR****UNIT – III: Steroids and Prostaglandins****UNIT – IV: Flavonoids and Isoflavonoids****UNIT – I: Basic Principles of Pharmacology****15 Hrs****(A) Definitions**

Disease, drug, bioassay, pharmacokinetics and pharmacodynamics. Stages involved in drug discovery, Formulation, Drug dosing, Routes of drug administration.

(B) Pharmacokinetics

Absorption, Distribution, Metabolism and Excretion of drugs (ADME), Bioavailability, Drug delivery.

(C) Pharmacodynamics

Nature of drug – receptor interactions, Theories of drug action: Occupancy theory, Rate theory, Induced-fit theory, and Macromolecular perturbation theory. Drug synergism and antagonism, drug toxicity, clinical trials.

UNIT – II: Drug Design, Lead Modification and SAR

15 Hrs

(A) Drug design

Lead discovery, Existing drugs as leads (me too drugs), Pharmacophore, Principles of design of agonists, antagonists and enzyme inhibitors, Design of salbutamol, cimetidine and captopril. Drug discovery without lead – serendipity-Penicillin and Librium as examples.

(B) Lead modification strategies

Bioisosterism, variation of alkyl substituents, chain homologation and branching, variation of aromatic substituents, extension of structure, ring expansion and ring contraction, ring variation, variation and position of hetero atoms, ring fusion, simplification of the lead, rigidification of lead.

(C) Structure-Activity Relationship (SAR) studies

SAR in sulfa drugs, benzodiazepines and taxol analogs; Structure pruning techniques with morphine as example, principles of prodrug design.

UNIT – III: Steroids and Prostaglandins

15 Hrs

(A) Steroids

Occurrence, nomenclature, basic skeleton, Diel's hydrocarbon and stereochemistry of steroids; isolation, structure determination of cholesterol, structure determination and synthesis of androsterone, testosterone, estrone and progesterone, biosynthesis of steroids.

(B) Prostaglandins

Occurrence, nomenclature, classification, biogenesis, physiological effects and synthesis of PGE₂ and PGF₂.

UNIT-IV: Flavonoids and Isoflavonoids

15 Hrs

Occurrence, nomenclature and general methods of structure determination; isolation, structure elucidation and synthesis of apigenin, luteolin, kaempferol, quercetin, and daidzein; biosynthesis of flavonoids and Isoflavonoids: acetate pathway and shikimic acid pathway.

Books Suggested

1. Natural Products: Chemistry and Biological Significance, J. Mann, R.S.Davidson, J. B. Hobbs, D. V. Banthrope and J. B. Hatrbnome, Longman, Essex.
2. Organic Chemistry, Vol. 2, I. L. Finar, ELBS.
3. Chemistry of Organic Natural Products, O. P. Agrawal, Vols. 1 &2, Goel Pubs.
4. Natural Products Chemistry K. B. G. Torsell, John Wiley, 1983
5. New Trends in Natural Products Chemistry, Atta-ur-Rahman and M.I.Choudhary, Harwood Academic Publisher.
6. Chemistry of Natural products P. S. Kalsi, Kalyani Publishers
7. Biosynthesis of steroids, terpenes and acetogenins, J. H. Richards & J. R. Hendrieson
8. The biosynthesis of secondary metabolites, R. D. Herbert, Chapman & Hall
9. The Biosynthesis of Secondary Metabolite, R. D. Herbert, Second edn, Chapman and Hall 1984
10. Medicinal Chemistry and Pharmaceutical Chemistry, H. Singh and Kaur.
11. An Introduction to Medicinal Chemistry, 4th Ed., G. L. Patrik.
12. Biochemical Approach to Medicinal Chemistry, Thomas Nogrady.
13. Principles of Medicinal Chemistry, William Foye.
14. Medicinal Chemistry, AshutoshKar.
15. Medicinal chemistry An introduction by Garreth Thomas.
16. Berger's Medicinal Chemistry, Vols. 1-5, Manfred E. Wolf.

MSNT303: Alloys and Paints

Unit-I: Alloys

15 h

Introduction to Alloys; Solid solution - substitutional and interstitial; Hume Rother's rules for primary substitution solid solubility; Intermediate phase – interstitial compounds, defect phase and electro valence compounds;

Shape memory alloys: General Characteristics; Nickel-titanium shape memory alloy, Cu-Zn-Al; Cu-Al-Ni alloy systems; Applications of shape memory alloys

Unit-II: Phase diagrams

15 h

Introduction; Phase rules; Unary phase diagrams – pure iron phase diagrams; **Binary Phase diagrams** – Ni-Cu system; Lever rule; Bi-Cd; Fe-C; Pb-Sn system; Uses of Phase diagrams; Limitations of phase diagrams

Unit-III: Fundamentals of Paints

15 h

Definition; **Ingredients of paints** –binders, pigments, additives, solvent and plasticizers; Classification of paints by curing mechanism (air dried and baked), solvent (aqueous and non-aqueous), functions of system ingredients (primers, sealers, under coats and finishing/top coats), solid content (high and low) and resin components; Film formers – synthetic resins (alkyd, acrylic and urethane coatings); **Methods of film formation**; Fundamentals of film formation; Factors affecting coating properties – film thickness (mechanical and optical methods), **film density and pigment volume concentration**

Unit-IV: Properties and Evaluations of Paints:

15 h

Optical properties of coatings (basics of color, gloss and hiding power); **mechanical properties of coatings** [structure-mechanical correlations and measurement and performance (hardness and bending tests)]; Ageing properties (accelerated outdoor and laboratory tests); Adhesion properties of coatings (factors affecting the establishment of adhesion bond, measurement of surface coating adhesion (Destructive methods film detachment by normal (direct pull off and topple method), by lateral stress (scratch and peel test) Non-destructive tests; Scratch, mar and wear resistance test; Anti-condensation paint test; Water and chemical resistance of paint films; Tautening test; Fire resistance; **Resistance to yellowing; Bleeding.**

References:

1. Physical Metallurgy by Vijendra Singh, Standard Publishing distributors
2. Material Science & Engineering by V. Raghavan, Prentice Hall of India
3. Physical Metallurgy- Principles, Practise by V. Raghavan, Prentice Hall of India
4. Introduction to Paint Chemistry by G.P.A. Turner, Oxford & IBH Publishing Company, India
5. Text Book of polymer science by Gowariker, Sreedhar and Viswanathan, Wiley-Eastern Publications. India
6. Surface coatings by Swaraj Paul, John Wiley & Sons (1985)
7. Testing of paints by CJA Taylor and S. Mark)

MSNT 304 Nanocatalysis and its Application

Unit I: Fundamentals in Catalysis

Homogeneous and Heterogeneous Catalysis – Characteristics of Catalytic Reactions - Promoters – Catalytic Poisoning – Activation Energy and Catalysis – Intermediate compound formation theory – Adsorption theory – Acid-base Catalysis and its mechanism - Enzyme Catalysis and its mechanism - Requirements for Successful Catalysts - Surface Area determination of non-porous and porous materials using BET method.

Unit II: Synthesis of Nanoporous Catalysts

Microporous materials: Zeolites- Zeotypes – Overall steps in zeolite crystallization- Zeolite synthesis via.- dry gel route- Zeolite Y- determination of surface acidity- shape-selectivity; Mesoporous aluminosilicates: Synthesis of Mesoporous Silica- MCM-41- SBA-15; Mesoporous Carbon - Sulfated Zirconia - Ag/SiO₂ composite nanocatalysts.

Unit III: Nanophotocatalysis and Catalysis of Gold nanocrystals

Introduction to photocatalysis: Principle- Band energy engineering- Degradation of dye - Hydrogen generation- Organic synthesis. Gold catalysts: Uniqueness- particle size- Metal-support interaction; Preparative methods: Co-precipitation – Deposition – Precipitation - Impregnation- Photodeposition- bimetallic catalysts; Properties- Selective oxidation & reduction reactions.

Unit IV: Applications of Nanocatalysts

Environmental protection; Energy processing: Processes involved in crude oil refinery- Gasoline production- Cracking- Fuel cell- Biomass gasification- Biodiesel- Naphtha reforming; Energy conversion & storage; **Synthesis of fine chemicals- Hydrogenation/dehydrogenation-** Synthetic fuels- Selective oxidation reactions- Polymerization.

References

1. Essentials of Physical Chemistry, Arun Bahl, B.S. Bahl, G.D. Tuli, S.Chand, Revised Edition 2012.
2. Nanoporous Materials: Synthesis and Applications, Edited by Qiang Xu, CRC Press, 2013
3. Catalysis: Principles and Applications, Edited by B. Viswanathan, S. Sivasanker, A.V. Ramaswamy, Narosa Publishing House, 2011
4. Photocatalysis, Edited by Masao Kaneko, Ichiro Okura, Springer, 2003.
5. New and Future Developments in Catalysis, Edited by Steven L. Suib, Elsevier, 2013.
6. Catalysis by Gold, Geoffrey C. Bond, Catherine Louis, David T. Thompson, Imperial College Press, 2006.

MSNT 404: Energy Conversion Technologies

UNIT - I Introduction

15 h

Principles of renewable energy – Introduction, Energy and sustainable development, Fundamentals, Scientific principles of renewable energy, Societal implications; Nanotechnology for sustainable energy - Energy conversion process; indirect and direct energy conversion; Nanotechnology enabled renewable energy technologies -Energy transport, conversion and storage.

Unit-II: Batteries

15 h

Principles of battery operation; Battery components; Types of batteries – Primary and secondary batteries; Lead acid, Nickel-cadmium and Lithium ion batteries

Unit-III: Fuel Cells

15 h

Fuel Cell principles; Types of fuel cells - Alkaline Electrolyte, Phosphoric acid, Molten Carbonate, solid oxide and direct methanol fuel cells; Principle and operation of Proton Exchange Membrane (PEM) fuel cell -Construction of PEM fuel cell stack, efficiency characteristics of PEM fuel cells; Direct methanol fuel cells

Unit-IV: Solar Cells

15 h

Importance of solar cells; Principle of operation; Current-voltage characteristics; Comparison of inorganic and organic solar cells, silicone solar cells - manufacture of polycrystalline and nanocrystalline silicon; Conjugated polymer solar cells - Concept of heterojunction (dispersed and molecular heterojunctions); Function of dye sensitized solar cells (DSSC).

Reference Books:

1. J. Twidell and T. Weir, *Renewable Energy Resources*, Routledge, Taylor & Francis group, New York, Third Edition (2015).
2. Vielstich, *Hand Book of Fuel Cells: Fuel Cell Technology and applications*, Wiley CRC Press
3. C.Rayment, S.Sherwin. *Introduction to fuel cell technology* (2003)
4. D.M.Roundhil, John P.Facker, *Optoelectronic properties of inorganic compounds*, Plenum press, New York (2009).
5. A brief history of the development of organic and polymeric photovoltoics, H.Spanggaard and F.C. Krebs, *Solar Energy Materials & Solar Cells* 83 (2004) 125-146.

Department of Genetics and Genomics
Semester-I
15124: ANALYTICAL BIOTECHNIQUES

Unit I

pH, Buffers: pH meter, glass electrode, reference electrodes, ion selective electrodes and oxygen electrode. Measurement of pH, pKa. Importance of pH and buffers in biological systems, Solutions - Molarity, Molality, Normality.

Centrifugation: Basic principles of centrifugation, Preparative and analytical, Rotors: Fixed Angle and Swinging Bucket, Differential Centrifugation, Ultra-centrifugation. Centrifuge Its Use and Safety.

Unit II

Chromatography: Principles, method and applications of Chromatography: Paper Chromatography, Thin Layer Chromatography(TLC), Column Chromatography, Gas liquid chromatography(GLC), High Performance Liquid Chromatography (HPLC), Affinity Chromatography.

Electrophoresis: Principles, method and applications of Agarose Gel Electrophoresis, Sodium Dodecyl Sulphate-Polyacrylamide Gel Electrophoresis (SDS-PAGE), native PAGE, Immuno-electrophoresis, Isoelectric-Focusing and Two-Dimensional Gel Electrophoresis; **Blotting techniques:** Northern blotting, Southern blotting, Western blotting.

Unit III

Radioactivity: half – life, decay constant, average life, units of radioactivity, Radioactivity measuring techniques, and correction factors. GM counter, liquid scintillation counter, γ counter. isotope dilution techniques and Radioactive disposal. Biological effects of radiation, applications of Radioisotopes in medicine.

Unit IV

Microscopy: Principles, method and applications of of light microscopy, Transmission electron microscopy(TEM), Scanning electron microscopy (SEM) and fluorescence microscopy.

Spectroscopy: Electromagnetic radiations, Beer – Lamberts law, principles and applications of colorimetry, spectrophotometry: UV, fluorimetry, flame photometry, Infrared, ESR, NMR spectroscopy, polarimetry.

Recommended Books

1. Principles and Techniques of Practical Biochemistry, Ed. Williams and Wilson.
2. Techniques in Molecular Biology Ed. Walker & Gastra, Croom Helm.
3. Principles of Instrumental Analysis, 2nd Ed. Holt-Sanders.
4. An Introduction to Spectroscopy for Biochemistry, Ed. Brown Sn., Academic Press.
5. Analytical Biochemistry, Holmes and Hazel Peck, Longman.
6. An Introduction to Practical Biochemistry. David t. Plummer, Tata Mac grew – Hill.
7. Biophysical Chemistry, Ed. Shall & Wyman, Academic Press Vol II & I.
8. A text book of quantitative inorganic analysis including elementary instrumental analysis, Vogel ELBS.
9. Biochemical Calculations Seigel, IH, 2nd Ed. John Wiley & Sons Inc.
10. Analytical Biochemistry by David Friefelder.

YOGI VEMANA UNIVERSITY COLLEGE:: KADAPA
DEPARTMENT OF APPLIED MATHEMATICS

M.Sc., Mathematics

Semester - II

NON-CORE PAPER

BUISINESS MATHEMATICS

UNIT - I

Number - H.C.F. and L. C.M. of Numbers - Decimal Fractions.

UNIT - II

Surds and Indices – Percentage - Profit and loss.

UNIT - III

Linear Equations in Two Variables – Ratio and Proportion- Variation.

UNIT -IV

NUMBER SYSTEM:

Types of Number Systems – Conversion of Decimal Number to Binary Number and Vice versa -Conversion of Decimal numbers to Octal numbers and Vice versa - Conervation of Hexadecimal number into Decimal number and Vice versa - Binary Airthmetic.

Scope and Standard as in “**OBJECTIVE ARITHMETIC**”, by **R.S.Aggarwal** , S.Chand and Company. Chapters 1,2,3,9,10,11,31,12,

Scope and Standard as in “**BUSINESS MATHEMATICS**”, by P.R.Vittal , Margham Publications, Chapter 1

MA 304 : OPERATIONS RESEARCH

UNIT I: **Linear Programming Problem:**

Mathematical Formulation: Introduction - Mathematical Formulation of the Problem
Linear Programming problem : Graphical solution Introduction- Graphical Solution Method – Some Exceptional Cases

Linear Programming : Simplex Method :- **The Computational Procedure** – Use of Artificial Variables.

UNIT II : Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Duality in Transportation Problem –Loops in Transportation Tables- LP Formulation of the Transportation Problem – Solution of a Transportation Problem – Finding an Initial Basic Feasible Solution – **Test for Optimality** – Degeneracy in transportation Problem – Transportation Algorithm (MODI Method) – Stepping Stone solution Method- Some Exceptional Cases

UNIT III: Assignment Problem: Introduction – Mathematical Formulation of the problem – The Assignment Method – Special cases in Assignment problems – A Typical Assignment problems – The Travelling Salesman Problem.

UNIT IV: Games and Strategies : Introduction – Two-Person Zero-Sum Games – Some Basic Terms- The Maximin – Minimax Principle – Games Without Saddle Points—Mixed Strategies – Graphic Solution of $2 \times n$ and $m \times 2$ Games – Dominance Property- Arithmetic **Method for $n \times n$ Games** – General Solution of $m \times n$ Rectangular Games.

Scope and Standard as in “**Operations Research**” by Kanti Swarup , P.k.Gupta and ManMohan , Sultan Chand & Sons , New Delhi.

Chapter 2: Sections 2.1 and 2.2 ;Chapter 3: Sections 3.1 to 3.3; Chapter 4: Sections 4.3 and 4.4; Chapter 10: Sections 10.1 to 10.13; Chapter 11: Sections 11.1 to 11.16, Chapter 17: Sections 17.1 to 17.9

REFERENCE BOOKS:

1. S.D. Sharma, “Operations Research”
2. H.A Taha, “Operations Research – An Introduction”.
3. “Operation Research “ By Pannerselvam R, Published by Prentice Hall of India New Delhi , 2002 Edition

MA 304 : CODING THEORY

UNIT I : Introduction to Coding Theory : Introduction – Basic Assumptions- **Correcting and Detecting Error Patterns** – Information Rate – The Effects of Error Corrections and Detection – Finding the Most Likely Codeword Transmitted – Some Basic Algebra – Weight and Distance – **Maximum Likelihood Decoding** – Reliability of MLD – Error – Detecting Codes – Error – Correcting Codes.

UNIT II : Linear Codes : Two Important Subspaces – Independence, Basis, Dimension – Matrices – Bases for $C = \langle S \rangle$ and C^{\perp} - Generating Matrices and Encoding – Parity – Check Matrices – Equivalent Codes – Distance of Linear Code – Cosets – MLD for Linear Codes – **Reliability of IMLD for Linear Codes.**

UNIT III : Perfect and Related Codes : Some Bounds for Codes – Perfect Codes – **Hamming Codes** – Extended Codes- The Extended Golay Code – Decoding the Extended Golay Code- The Golay Code – Reed – Mullar Codes – Fast Decoding for RM (1,m).

UNIT IV : Cyclic Linear Codes : Polynomials and Words – Introduction to Cyclic Codes – Polynomial Encoding and Decoding – Finding Cyclic Codes – Dual Cyclic Codes.

Burst Error – Correcting Codes : Introduction – Interleaving – application to Compact Disc.

Scope and Standard as in “**Coding Theory The Essentials**” by D.G.Hoffman, D.A. Leonard, C.C. Linder, K.T.Phelps, C.A.Rodger, J.R.Wall, Monographs and text books in Pure and Applied Mathematics.

Chapter 1: Sections 1.1 to 1.12, Chapter 2: Sections 2.1 to 2.12, Chapter 3: Sections 3.1 to 3.9, Chapter 4 :Sections 4.1 to 4.5 , Chapter 7: Sections 7.1 to 7.3 .

MA 402: GRAPH THEORY

UNIT I - Introduction to Graphs : Definition - **Graphs As Models** - Vertex Degrees - Sub graph paths and cycles - The Matrix Representation of Graphs - Fusion.

UNIT II **Tress and connectivity** : Definition and simple properties - Bridges -Spanning tress - Connector Problems - Shortest path Problem - Cut Vertices and connectivity.

UNIT III **Euler tours and Hamiltonian cycles**: Euler tours - The Chinese Postman Problem – Hamiltonian graphs - **The Traveling salesman Problem**.

UNIT IV **Planar Graphs** : Plane and Planar graphs - Euler's Formula - The platonic bodies - Kuratowski's Theorem - Non Hamiltonian plane graphs - The Dual of a plane graph.

Scope and Standard as in “**A First Look At Graph Theory**” By John Clark and Derek Allan Holton, Allied Publishers Ltd.

Chapters 1,2,3 and 5,

REFERENCE BOOKS :-

1. “Graph Theory With Application” J.A.Bondy and U.S.R.Murthy, Millon Press.
2. “Discrete Mathematical Structure and Graph Theory” – By Rao.
3. A Text Book of “Graph Theory and its Applications” – By B.Suryanarayana and G.K.Ranganath.

MA 403: NUMBER THEORY

UNIT I Arithmetical Functions and Dirichlet Multiplication: Introduction – The Mobius function $\mu(n)$ – The Euler totient function $\phi(n)$ – A relation connecting ϕ and μ – A product formula for $\phi(n)$ – The Dirichlet product of arithmetical functions – Dirichlet inverses and the Mobius inversion formula – The Mangoldt function $\Lambda(n)$ – Multiplicative functions
 Multiplicative functions and Dirichlet multiplication – The inverse of a completely multiplicative function – Liouville's function – The divisor function $\sigma_\alpha(n)$ – **Generalized Convolutions** – **Formal Power series** – The Bell series of an Arithmetical function – Bell series and Dirichlet multiplications – Derivatives of arithmetical functions – **The Selberg identity.**

UNIT II Averages Of Arithmetic Functions : Introduction - The big O notation- Asymptotic equality of functions – Euler's summation formula – Some elementary asymptotic formulas – The average order of $d(n)$ - The average order of the divisor functions $\sigma_\alpha(n)$ – The average order of $\phi(n)$ – An application to the distribution of lattice points visible from the origin – The average order of $\mu(n)$ and of $\Lambda(n)$ – The partial sums of a Dirichlet product.

UNIT III Congruences: Definition and basic properties of congruences – **Residue classes and complete residue systems** – Linear congruences – Reduced residue systems and the Euler – Fermat theorem – Polynomial congruences modulo p . Lagrange's theorem – Applications of Lagrange's theorem – Simultaneous linear congruences – The Chinese remainder theorem – Application of the Chinese remainder theorem – Polynomial congruences with prime power moduli – **The principle of cross – Classification** – A decomposition property of reduced residue system.

UNIT IV Quadratic Residues and The Quadratic Reciprocity Law: **Quadratic residues** – Legendre's symbol and its properties – Evaluation of $(-1 | p)$ and $(2 | p)$ – Gauss' lemma – The quadratic reciprocity law – Application of the reciprocity law – **The Jacobi symbol.**

Primitive Roots : The exponent of a number mod m . Primitive roots – **Primitive roots and reduced residue systems** – The non existence of primitive roots mod 2^α for $\alpha \geq 3$.

Scope and Standard as in “**Introduction to Analytical Number Theory**”, by Tom. M. Apostol, Springer International Student Edition

Chapter 2, Chapter 3: Sections 3.1 to 3.10, Chapter 5, Chapter 9: Sections 9.1 to 9.7 ,

Chapter 10: Sections 10.1 to 10.3

REFERENCE BOOK :-

Niven , I and Zuckerman , H.S (1972) “**An Introduction to the Theory of Numbers**”, 3rd Edition, New Yory “ John Wiley and sons, Inc

45011 - Plant Tissue Culture

Unit- I: Basics of plant tissue culture technique

Historical aspect and landmarks in plant tissue culture, concept of cellular totipotency and cellular differentiation, basic techniques in plant tissue culture, formulation of media for plant tissue culture, cultural conditions, physiological, biochemical and molecular role of mineral, carbohydrate and growth regulators in differentiation of organs under *in vitro* conditions.

Unit-II: Pathways of *in vitro* regeneration (Vegetative explants)

In vitro regeneration methods: Micropropagation, organogenesis (direct and indirect), somatic embryogenesis; Problems of tissue culture: contamination, phenolics, recalcitrance; Genome reorganization induced *in vitro*, somaclonal and gametoclonal variations; problems in establishment of regenerated plants in nature, hardening of plants.

Unit- III: Pathways of *in vitro* regeneration (reproductive explants) and protoplast culture

Gametic embryogenesis (androgenesis and gynogenesis), doubled haploids, culturing of ovary, ovule, nucellus, embryo, embryo rescue, triploid production, somatic hybridization; protoplast isolation, fusion and culture, hybrid selection and regeneration, possibilities, achievements and limitations of protoplast regenerants.

Unit- IV: Application of Plant Tissue Culture

Meristem culture for production of virus free plants, artificial seeds, production of secondary metabolites from cell suspension culture and hairy root culture, elicitors, plant cell reactors-bio reactors culture of isolated single cell, role of tissue culture in gene transfer, cryopreservation and germplasm storage.

Suggested Practicals

1. Preparation of different types of Media
2. Callus induction from carrot cambial explants or any other source. Callus cytological studies
3. Induction of Somatic Embryogenesis
4. Suspension Cultures
5. In vitro rooting of cultures
6. Culture of anthers for production of haploids
7. Induction of multiple shoots
8. Preparation of artificial seeds by sodium alginate.

Suggested Readings

1. Razdan, M.K. 2014. Introduction to Plant Tissue Culture (Second edition). Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Bhojwani, S.S. 1990. Plant Tissue Culture Applications and Limitations: Elsevier, New York
3. Bhojwani, S.S. and M.K.Razdan 1996. Plant Tissue Culture. Theory and practice (rev. ed) Elsevier Science Publishers, New York.

YOGI VEMANA UNIVERSITY
5 years Integrated M. Sc., Biotechnology and Bioinformatics
Semester IV

Paper 46013: PRINCIPLES OF MANAGEMENT AND ENTREPRENEURSHIP

UNIT – I:

Introduction to Management: Definition - Concept – Significance - Management Vs Administration – Leader Vs Manager - Principles of Management - Functions of Management; Planning – Definition of Planning – Steps in Planning – Types of Plans.

UNIT – II:

Organizing and Communication: Nature of Organizing – Organisation Levels – Organisation Design and Structure – Delegation; Communication - Process of Communication – Barriers to **Effective Communication** - Measures to Effective Communication.

UNIT – III:

Motivation, Leadership and Controlling: Motivational Theories – Maslows Need Hierarchy Theory – Two Factor Theory; Leadership Styles; Controlling - Concept - Process – Control Techniques.

UNIT – IV:

Entrepreneurship Development: Concept – Characteristics - Functions of Entrepreneur – Types of Entrepreneur - Factors Affecting Entrepreneurial Growth - **Women Entrepreneurship** - Problems in Entrepreneurship Development - Role of Entrepreneurship in Economic Development – **Entrepreneurship Development Programmes (EDPs)** - Various Entrepreneurship Development institutions in India.

Reference Books:

1. Subba Rao P., Management & Organisational Behaviour, Himalaya Publications, New Delhi.
2. Agrwa, Research and Development Organisation and Management, Tata McGraw hill.
3. Koontz and Weichrich; Essential of management, Text and cases, Tata Mcgraw.
4. S.S. Khanka, Entrepreneurship Development, S. Chand Publications, New Delhi
5. Vasanth Desai, Dynamics of Entrepreneurship Development and Management, Himalaya Publications, New Delhi.

YOGI VEMANA UNIVERSITY
5 years Integrated M. Sc., Biotechnology and Bioinformatics
Semester IX

96012: BIOETHICS, BIOSAFETY, AND IPR

Unit I

Biotechnology and Society – Social, ethical and legal aspects of biotechnology. Implications of biotechnology on **health, environment, food and sustainable agriculture**. Beneficial application and development of research focus to the need of the poor, identification of directions for yield effect in **agricultural, aqua cultural, bioremediation**.

UNIT I

Ethical issues - introduction, causes of unethical acts, ignorance of laws , codes policies and procedures, recognition, friendship, personal gains, ethical decision making ,teaching ethical values to scientist , **good laboratory practices, good manufacturing practices, laboratory accreditation. Bioethics and biosafety regulations**

UNIT II

Environmental and health aspects of biotechnology – Genetically engineered microorganism – introduction of novel species and natural equilibrium – environmental security and safety – precautionary measures – Genetically modifies foods –health safety, biosafety concern with radioactivity.
 Prenatal diagnosis – **Genetic screening** – surrogate mothers, manipulation of human genome, **gene therapy, cloning, technology transfer**.

Unit IV

IPR – definition – classification and forms, Rationale for protection of IPRs, importance of IPRs in the fields of science and technology. **Patenting** – Examples of Patents in Biotechnology. Essential requirements for **IPR procedures of filling**. Global and Indian Biodiversity Act, Indian Patent Act and their revised versions. Regulatory mechanisms in releasing GMOs. Plant breeders rights, WTO, GATT & TRIPS.

References:

1. Sasson A. Biotechnologies in developing countries present and future, UNESCO publishers, 1993.
2. Singh K. Intellectual Property rights on Biotechnology, BCIL, New Delhi. Gene cloning – Brown
3. Concepts in Biotechnology – Balasubramanyam.D
4. Safety, Moral, Social and Ethical issues related to geneticalls modified foods – Smith J.E.
5. Environmental Biotechnology- Forster and wase

31015 - Elective II (Core)
COMMUNICATIVE ENGLISH

UNIT – I

1. Communication Process- **Types of Communication - Verbal and Non-Verbal Communication** – Principles - Barriers
2. Listening Process – Types of Listening - Barriers to Listening- Listening Comprehension – **Effective Listening Strategies** – Listening to Structured Talks – **Listening and Note Taking.**

UNIT – II

3. The Speech Process – Conversation and **Oral Skills.**
Improving Fluency and Self Expression – Body Language
4. **Job Interviews - Group Discussions - Presentation Skills**

UNIT – III

5. Reading Process – Reading Strategies - Reading Narratives Critical and Interpretative Reading.
Introduction to Reading Skills – Understanding the Organization of a Text.
6. Reading Graphs - Reading descriptions, persons, Places and Processes.

UNIT – IV

7. **Paragraph Writing, Writing Academic English –** Research Papers – Features
8. Professional Writing: **Letter Writing Skills,** Resume and Job Application – E-mail – Reports.

1. Prof G. Gulam Tariq :
2. Prof. P. Padma :
3. Dr. J. Mercy Vijetha :
4. Dr. N. Ankanna :
5. Dr. RV. Jayanth Kasyap :

Prof. P. PADMA
(BOS Chairperson)
Dept. of English
Yogi Vemana University
Kadapa -516005



104: CORPORATE FINANCIAL ACCOUNTING

Objective: The objective of this paper is to expose the students to advanced corporate financial accounting issues and practices.

UNIT-I: Introduction to Accounting: Nature and Scope of Financial Accounting – Importance – Objectives - Generally Accepted Accounting Principles (GAAP) – Indian Accounting Standards and International Accounting Standards. (Theory only)

UNIT-II: Inflation Accounting: Definition - Limitations of Historical Accounting – Methods of Accounting for Price Level Changes - Current Purchasing Power (CPP) - Current Cost Accounting (CCA) - Gearing Adjustment. (Theory & Problems)

Unit-III: Human Resource Accounting: Concept - Suggested Methods for Valuation of Human Resources - Advantages and Disadvantages of HR Accounting; Corporate Social Accounting - Concept and Objectives of Social Accounting - Social Accounting Measures - Social Responsibility Accounting; Government Accounting - Structure of Government Accounting - Commercial Accounting Vs Government Accounting.

Unit-IV: Consolidated Financial Statements: Definition - Preparation of Consolidated Balance Sheet – Minority Interest – Pre Acquisition or Post Acquisition Profits – Cost Control or Goodwill – Inter Company Balances – Bonus Shares – Treatment of Dividends – More Than One Subsidiary - Inter Company Holdings – Preparation of Consolidated Financial Statements. (Theory & Problems)

Suggested Books

1. Gupta, R.L. and Radhaswami, M., Advanced Accountancy, S. Chand & Co., New Delhi.
2. Jain and Narang, Advanced Accountancy, Kalyani Publications, New Delhi
3. M.C. Shukla, T.S. Grewel, Advanced Accountancy, S. Chand & Co., New Delhi.
4. S.N. Maheswari and S.K. Maheswari, Corporate Accounting, Vikas Publishing House, New Delhi.
5. Arulanandam, Advanced Accountancy, Himalaya Publishing House, Delhi.
6. Ghosh, T.P., Accounting Standards and Corporate Accounting Practices, Taxmann.
7. Jawaharlal, Accounting Theory, Himalaya Publishing House.
8. I.M. Pandey, Management Accounting, Vikas Publication.
9. Bhatta J, Management Accounting, ELBS.
10. Khan and Jain, Management Accounting, Tata McGraw Hill.



205: E-COMMERCE

Objective: The objective of this paper is to help the students to know about the contents of e-commerce and its practices in business.

UNIT-I: Introduction to E-Commerce: Concept – Features - Advantages and Disadvantages of E-Commerce - Global e-Commerce Environment - Adopting e-Commerce - **Evolution of e-Commerce** - Future of e-Commerce – Issues in e-Commerce: Privacy Issues –Social Issues - Security Issues.

UNIT-II Web Design: World Wide Web - **Web designing** - Web as market place - Role of Website in B2C e-Commerce - Push and Pull Approaches - Alternative Methods of Customer Communication such as e-mail – BBA - E-mail Etiquette and e-mail Security.

Hands on Practice: Web Page Designing – E mail Creation – E mail Security.

UNIT-III: Business Models of E-Commerce: B2B - B2C - B2G and Other Models of e-Commerce - Applications of e-Commerce to Supply Chain Management - Digital Market: Concept - **Traditional Market Vs Digital Markets** - Product and Service Digitization – Digital Marketing – Digital Advertising – Digital Branding – Retailing – Trading of Stocks – **e Auctions** - **Digital Marketing Trends.**

UNIT-IV: E-Payment System: Various types of **e-Payment Systems** – Debit Card System – Credit Card System – Digital Cash - Smart Cards – **Digital Cheque** - **Digital Wallets**; Threats: Types of Threats - Sources of Threats - Protecting e-Commerce Assets and Intellectual Property – Firewalls – Client Server Network Security - Security Tools - Digital Identity - Digital Signature.

Hands on Practice: Creating Digital Signature – Usage of Digital Cash – Payment through Credit / Debit Card – Usage of Digital Wallet.

Suggested Books

1. Efraim Turban, Jae Lee, David King and H.Michael Chung, Electronic Commerce – A managerial perspective, Pearson Education, New Delhi.
2. Kenneth C.Laudon, and Carol Guercio Traver, E-Commerce – Business, technology and society, Pearson Education, New Delhi.
3. Joseph, E-Commerce, PHI, New Delhi.
4. Ravi kalakota, Whinston, Frontiers of Electronic Commerce, Pearson Education, New Delhi.
5. Daniel Minoli, Emma Minoli, Web Commerce Technology Handbook, Tata MC Graw Hill, New Delhi.
6. Ward Hanson, Internet Marketing, Thomson Learning Inc, Bangalore.



302: CORPORATE TAX AND GST

Objective: The objective of this paper is to describe the theoretical and practical knowledge of taxation to the students.

UNIT- I: Introduction: Meaning - Definition – Brief History of Tax – Types of Taxes – Basic Concepts – Objectives – Principles – Legal Framework – Advantages and Disadvantages of **Taxation – Tax Planning** – Tax Avoidance – Tax Evasion – Tax Management – Income – Types of Income – Penalties and Prosecutions – Tax Reforms (Theory only)

UNIT- II: Company Taxation: Introduction – Definition- Features – Types of Companies – Residential Status of a Company – Incidence of Tax – Income Sources – Agricultural and Non-agricultural – Income Computation of Gross Total Income of a Company – Tax Deductions U/S 80 – Carry Forward and Set Off - Accumulated Tax (Theory & Problems)

UNIT- III: Goods and Service Tax (GST): Concept – Types of GST – Features of GST - Advantages and Disadvantages – Comprehensive structure of GST Model in India – Registration under GST – GST Migration - GST Slabs in India – Transactions Covered under GST – Items Exempted from GST - Changes in GST since Beginning. (Theory only)

UNIT- IV: GST Execution: Input Tax Credit – Distribution of Tax – Tax Invoice in GST – GST Composition Scheme – GST Returns - Reverse Charge Mechanism in GST - GST on Exports and Imports – Taxes on Outside the Purview of GST. (Theory only)

Suggested Books

1. Monica Singhanian Vinod K Singhanian, Students Guide to Income Tax, 57th Edition (2017-18), July 2017,
2. Vinod K. Singhanian, Indirect Tax Laws, Taxmann Publications.
3. Gaur, V.P. Narang, D.B. Gaur, Puja Puri, Rajeev, Income tax Law and Practice, Kalyani Publishers
4. R.G. Saha, Taxation, Himalaya Publishing House Pvt. Ltd.
5. Joy Dhingra, Goods and Services Tax Fundamentals, 2017, Kalyani Publishers.
6. Dr. Thomas Joseph Thoomkuzhy, Dr. Jaya Jacob M., Ms. Chinnu Mariam Chacko, GST The Essentials of Goods and Services Tax: 2017, Himalaya Publishing House.
7. V S Datey, GST Ready Reckoner: Enforced with Effect from 1-7-2017, July 2017 4th edition, Taxmann publication
8. The Central Goods and Services Tax Act, 2017, NO. 12 OF 2017 Published by Authority, Ministry of Law and Justice, New Delhi, the 12th April, 2017.



401: SOFT SKILLS FOR CAREER DEVELOPMENT

Objective: to equip students with the most needed soft skills, positive attitude, personality development skills, communication skills, time management and interview skills.

Unit-I: Soft Skills: Meaning - Importance – Selling Your Soft Skills – **Identifying and Exhibiting Soft Skills** – Improving Soft Skills – Train Yourself – Practicing Soft Skills; Career Planning: Meaning and Importance – **Guidelines for Choosing a Career** – Myths About Choosing a Career – Tips for Successful Career Planning - Goal Setting.

Unit-II: Personality Development Skills: Self Esteem: Characteristics – **Causes of Low Self-esteem** – **steps to build positive self-esteem**; Know Yourself – Importance of Know Yourself – Process of Know Yourself – SWOT Analysis – Benefits of **SWOT Analysis**; Body Language – Body Talk – Voluntary and Involuntary Body Language – Types of Body Language – Improving Your Body Language Positive Attitude - Steps in Building Positive Attitude – Obstacles in Developing Positive Attitude

Unit-III: Communication Skills: **Art of Listening** – Meaning – Benefits of Active Listening – Kinds of Listening - Factors that Hamper Listening – Poor Listening Habits – Tips For Listening; **Art of Public Speaking** – Importance of Public Speaking – Benefits of Public Speaking – **Tips for Public Speaking**; Art of Writing – Meaning and Importance – Creative Writing – Writing Tips – Drawbacks of Written Communication; **Art of Letter Writing** and E-mail; Resume/CV Preparation

Unit-IV: Interview Skills : Concept - Types of Interviews - **Art of Facing Interview** – Common Mistakes Commits at the Time of Interview; Quick Tips - Written Test - Group Discussion – Role Play - Dress Code & Appearance - Final Interview – **Time Management**- Ideal Way of Spending a Day - Time Savers - Time Wasters; Stress Management – Meaning – Effects of Stress – Kinds of Stress – Sources of Stress – How to Overcome Stress.

Suggested Books

1. Alex, K., Soft Skills – Know Yourself and Know the World, S. Chand Publishers, New Delhi.
2. Scot Ober, Contemporary Business Communication, Wiley India, New Delhi.
3. Parag Diwan, Business Communication, Excel Publications, New Delhi.
4. Hind, D., Transferable Personal Skills: A Student's Guide, Sunderland.
5. Pandey Shastri, Personality Development and Communicative English, Himalaya Publishing House, New Delhi.
6. C. S. Rayudu, Communication, Himalaya Publishing House, New Delhi.
7. Biswajit Das, Business Communication and Personality Development, Excel Books.
8. K. Srinivasa Krishna & B. Kuberudu: Business Communication and soft skills, excel, Hyderabad, 2008.
9. Seghal, M.K. Business Communication, Excel Books, New Delhi.



402: ENTREPRENEURSHIP DEVELOPMENT

Objective: The objective of this paper is to coin the students about the conceptual framework of entrepreneurship development along with financial institutions aiding to Entrepreneurship Development in India.

UNIT-I: Entrepreneurship: Concept – Characteristics of an Entrepreneur – Functions – Types of Entrepreneur – Entrepreneur Vs. Manager - Entrepreneur Vs. Intrapreneur - Myths about Entrepreneurship – Role of Entrepreneurship in **Economic Development** - Problems of Entrepreneurship; **Rural Entrepreneurship**; **Women Entrepreneurship**.

UNIT-II: Entrepreneurship Development: Economic and Non-Economic Factors affecting Entrepreneurship Development - Government Actions - Entrepreneurial Motivation – Competencies - Mobility – **Entrepreneurship Development Programmes (EDPs)** - **Growth of Entrepreneurship in India**.

UNIT-III: Small Enterprises: Meaning - Objectives – Opportunities for Entrepreneurial Career – Role of Small Enterprises in Economic Development – Problems of Small Enterprises - Small Enterprise Process - **Project Identification and Selection** – Project Formulation – Project Appraisal – Financing - **Government Policy for SSIs**- Need for Tax Benefits- Tax Holiday; Investment Allowance; Tax Concessions for SSIs in Rural and Backward Areas; Startups – Role of **Startups in Industrialization**.

UNIT-IV: Institutional and Policy Initiatives for Promotion of ED: Introduction - Need for Institutional Finance – **Commercial Banks** - Other Financial Institutional: Central Level Institutions- KVIC; SIDO; NSIC Ltd; MUDRA, SIDBI; State Level Institutions – DIC - SFC- SSIDC - **Venture Capital Institutions** - Industrial Estates.

Suggested Books

1. Thomas, W. Zimmerer, Norman, M. Scarborough, Essentials of Entrepreneurship and Small Business Management, Pearson Education, New Delhi
2. Nandan, H., Fundamentals of Entrepreneurship, Prentice Hall of India, New Delhi
3. Vasant Desai, Dynamics of Entrepreneurship Development and Management, Himalaya Publishing House, New Delhi
4. Madhurima Lall, Shiksha Sahai, Entrepreneurship, Excel Books, New Delhi.
5. S.S.Khanka, Entrepreneurship Development, S.Chand publications, New Delhi.
6. Developing Entrepreneurship-Issues and Problems, NISIET, Hyderabad.
7. Jain and Varshney, Entrepreneurship Development-An Indian Perspective, HPH.
8. Schumpeter J, The Theory of Economic Development, Harvard University Press.
9. Hadimani R.N, Dynamics of Industrial Entrepreneurship, Ashish Publishing House.



OPEN ELECTIVE PAPER THEORY

OEPT-306: BANKING AND INSURANCE SERVICES

Objective: The objective of this paper is to create awareness about the Banking and Insurance services which are rendering service in India.

Unit -I : Introduction of Banks: Definition - Function of Bank - Types of Banks - Co-operative Banks - Commercial Banks – Nationalisation of Commercial Banks - Regional Rural Bank - Reserve Bank of India - Functions of RBI – Role of RBI in Indian Banking System.

Unit-II: Banking Services: Concept – Classification – E-Banking - Credit Cards - Debit Cards – Digital Wallets - Personal Identification Number – Online Enquiry and Update facility- Electronic Fund Transfer.

Unit-III: Insurance Services: Concept - Objectives – Classification - Life Insurance – Types of Life Insurance Products; Health Insurance - Individual and Group Insurance – Life Insurance in India.

UNIT-IV: General Insurance: Concept – Fire Insurance - Automobile Insurance – Marine Insurance - Agricultural Insurance – General Insurance in India - Insurance Regulatory and Development Authority (IRDA) Act.

Suggested Books

1. Guruswamy, Financial Services and Markets, Thomson , New Delhi
2. Pathak, Financial Markets and Services, Pearson Educations.
3. Gordon and Natarajan, Financial Markets and Services, Himalaya Publishing House, New Delhi
4. Avadhani, Marketing of Financial Services, Himalaya Publishing House.
5. Principles of Risk Management and Insurance (Seventh Edition), Pearson Education
6. Koteswar G, Risk Management - Insurance and Derivatives, Himalaya Publishing House, New Delhi
7. P.K. Gupta, Insurance and Risk Management, Himalaya Publishing House, New Delhi.
8. T.T.Seth, Insurance Principles and Practices, S. Chand, New Delhi

302: ENTREPRENEURSHIP & SMALL BUSINESS MANAGEMENT

Course Objective: The objective of this course is to create conceptual understanding of the topic among the students and comprehend the environment of making of an Entrepreneur and to develop perspective understanding of startups and MSMEs in the Indian context.

Unit – I Entrepreneur and Entrepreneurship: Evolution of the Concept of Entrepreneur – Characteristics of an Entrepreneur – **Distinction between an Entrepreneur and Intrapreneur and a Manager** – Functions of an Entrepreneur – Types of entrepreneurs, Concept of Entrepreneurship – Functions, Problems, Entrepreneurial process – Growth of Entrepreneurship in India – Recent Trends of Women Entrepreneurship – Meaning of and Need for Rural Entrepreneurship – Problems and Development of Rural Entrepreneurship.

Unit II Startup Ideas and Opportunity Assessment: Importance of Ideas – Sources of startup Ideas – Techniques for generating ideas – Steps in potential ideas – Opportunity Recognition- sources and process – Development of Programmes E – Business Ventures – Importance of Financial Management – Project Feasibility Study.

Unit – III MSME Enterprises: Definitions, Characteristics – **Relationships of MSME** – Relationship with large units – Export Oriented Units - Rationale – Objectives – Scope of Small Enterprises – Opportunities for an Entrepreneurial career – **Role of Small Enterprises in Economic Development** – Causes and Symptoms of Sickness – Cure for Sickness.

Unit IV Project preparation and Financing Ventures: Meaning of and Preparation of Project – Importance of Report – Content; Guidelines for Report preparation – **Network Analysis** – PERT and CPM – Sources of Finance – Concept of working Capital and Estimation – Seed Capital – Venture Capital.

Unit V Institutional support to Entrepreneurs: Commercial Banks – Other major financial institutions – **Central Level Institutions** – KVIC; SIDO; NSIC : National Productivity Council (NPC); EDII – State Level Institutions – DIC – SFC-state Small Industries Development Corporation (SSIDC) – Industry Associations – Confederation of Indian Industry(CII) ; **Federation of Indian Chamber of Commerce Industry (FICCI)**; Associated Chambers of Commerce and Industry of India (ASSOCHAM)

Suggested Books:

1. Vijay Sathe, “Corporate Entrepreneurship” 1st edition, 2009, Cambridge
2. S.S. Khanka, “Entrepreneurial Development”, 2007, S. Chand & Co. Ltd.
3. Vasanth Desai, “Dynamics of Entrepreneurial Development and Management”, 2007, HPH,Millenium Edition.
4. Dr. Vasant Desai, “Small Scale Industries and Entrepreneurship”, 2006, HPH.
5. P. Narayana Reddy, “Entrepreneurship – Text and Cases”, 2010, 1st Ed. Cengage Learning.
6. David H. Hott, “Entrepreneurship New Venture Creation”, 2004, PHI.
7. E – Book, MSME at a glance – English version, Ministry of MSME.
8. Jaynal Ud – Din Ahmed and Abdul Rashid, MSME in India, New Century Publications.

MARKETING ELECTIVES

311: LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Course Objective: The Objective of this course is to gain the knowledge of possibilities of efficient optimization and management of operation in integrated supply chains and also the ability to apply them in the enterprise reality. The course will also strengthen the holistic view on supply chain operations, management and strategy and some current research areas in supply chain management.

UNIT I Understanding Logistics and Supply Chain Management: Concepts - **Logistics Relationships** - Mission of Logistics Management - **Objectives of Logistics Management** - Definition and importance of supply chain - Issues in Supply Chain Management - supply chain drivers.

UNIT II Customer Service and Bench marking: Elements of customer service - service driven logistics system - **customer focus in supply chain management** - concept of bench marking - bench marking process - **benefits of bench marking and competitive bench marking.**

UNIT III Managing the Supply Chain and Integration: Need for integration, managing supply chain as a network - logistics partnerships - supply chain restructuring - IT in supply chain, Coordination in supply chain - Inter functional coordination - Inter Corporate coordination.

UNIT IV Decisions of Logistics and Supply Chain: Sourcing decisions - Transportation decisions - Warehousing decisions - Material handling and packaging.

UNIT V Global Logistics and Supply chain: Organizational structure for global logistics - problems and challenges of global logistics and supply chain management - global supply chain management vs domestic supply chain management.

References:

1. Christopher Martin. (3rd Edition, 2004). Logistics & Supply Chain Management Creating ValueaddingNetworks. Pearson Education.
2. Supply chain Logistics Management, Bowersox, Closs, Cooper, 2/e, TMH, 2009
3. Supply Chain Management ,Janat Shah, Pearson
4. Supply chain management concepts and cases, Rahul V. Altekar, PHI, 2008
5. Text Book of Logistics and Supply Chain Management, Agrawal, Macmillan, 08
6. Principles of Supply Chain Management – A balanced approach, Wisner, Leong, Tan,
7. Supply Chain Management, R.P. Mohanty and S.G. Deshmukh, Jaico , 2009

322: TAXATION MANAGEMENT

Course Objectives: This course is designed to learn the concepts of Direct Taxation and Indirect taxation.

UNIT-I: Direct taxation – Income tax Act 1961 - Basic concepts – Residential status - Source of income - Income under the head salaries - Income from house property. **(Theory and Problems)**

UNIT-II: Profits and gains of business or profession - Capital gains - Income from other sources -Tax evasion -**Income tax authorities.** **(Theory and Problems)**

UNIT-III: Set-off and carry forward : Income of other persons included in assessee's total income - set-off and carry-forward of losses - Deductions from total income - **Employee Tax planning.** **(Theory only)**

UNIT-IV: Wealth Tax Act: Entire Act with basic provisions - basic case laws

UNIT – V: Indirect Taxation - Elements of Excise Act - Customs Act - **VAT and Service Tax Act - Concept of GST.** **(Theory only)**

SUGGESTED READINGS:

1. Vinod K. Singhania: - Indirect Tax Laws, Taxmann Publications.
2. Bhagwati Prasad: Direct Tax Laws and Practice.
3. V. S. Datey: Indirect taxes, Taxman Publications.
4. Vinod K. Singhania, Monica Singhania- Corporate Tax Planning and Business Tax Procedure- Tax Procedure - Taxmann Publication Pvt. Ltd.
5. Vinod K. Singhania, Kapil Singhania, 'Direct Taxes, Law and Practice', Taxmann Publication Pvt. Ltd.
6. Financial Acts of Relevant Financial Years.
7. Guide To Tax Planning, R N Lakhota

412: Advertising and Sales Promotion

Course Objective: The objective of the course is to provide students with detailed knowledge on marketing mix.

Unit-I

Advertising: Advertising types, role of advertising in developing economy, advertising agency, advertising budget, evaluation of advertising effectiveness: pre testing, post testing, DAGMAR, social, cultural and ethical dimensions of advertising

Unit-II

Advertising agencies: Word of mouth advertising, advertising planning, creativity of advertisement copy, employing the internet for advertising, advertising research, agency-client interface, functions and types of agencies

Unit-III

Media Management and planning: Types of media, media scheduling decisions, media mix decisions, media evaluation and selection, media effectiveness, social and ethical aspects of media

Unit-IV

Sales promotion and sales force management: Sales promotion: objectives, types of sales promotion tools, personal selling: sales personality, retail salesman's duties, responsibilities and problems, types of salesmen, AIDAS, training sales personnel, motivating the sales force, compensating sales personnel

Unit-V

Direct marketing and Public Relations: advantages, techniques, public relations objectives, tools of public relations, event marketing : Importance, promotion of events.

Reference Books

1. Foundations of Advertising theory and practice S.A Chunawalla, K.C Sethia, Himalaya Publishing House
2. Sales & Advertisement Management, S.Raj kumar, V.Raja Gopalan, S.Chand Publisher
3. Advertising Management, Jeth Waney, Jain Oxford Publisher
4. Integrated Advertising, Promotion and Marketing communications, Krusti shah, Lon D Souza, TMH Publisher
5. Salesmanship and Publicity, Rustom S Davar, Sohrab R Davar, Nusli R Davar
6. Marketing Management, R.S.N Pillai Bagavathi S.Chand Publisher

NC-2: Microbial Technology and Entrepreneurship

UNIT – I

(15 hrs)

Microorganisms in the service of man and society– Past, Present and Future. Traditional Microbial Technologies – Curdling of Milk, Bread and Wine, making other traditional foods of India and the World.

Microorganisms of Industrial importance – Over view of Isolation, Screening and Maintenance, **Microbial Industries** and **Commercially important products**, Status and Demand and Production – Indian and Global Scenario.

UNIT – II

(15 hrs)

Raw materials for Microbial Processes – Availability and utilization, Significance of locally available raw material. **Production of Pharmaceutically and Commercially important products** – Alcohol and Alcoholic beverages.

Antibiotics, Enzymes, Vitamins and Monoclonal antibodies. Production of fermented milk products Yogurt and Cheese.

UNIT – III

(15 hrs)

Microbes in Agriculture – Composting, Nitrogen fixation, **Vermi composting**, over view of bio fertilizers and bio pesticides – Production and applications. **Microbial fuels** – Alternate sources of energy – Methane and **Hydrogen production**, their significance, microorganisms in the recovery of precious metals, **bio degradable polymers from microorganisms**.

Microbes in Food - Single cell proteins and Single cell oil – Mushroom cultivation, Genetically engineered micro organisms – Applications in health, industries, agriculture, environment, fate of genetically engineered micro organisms in the environment.

UNIT – IV

(15 hrs)

Microbial entrepreneurship – Government schemes for commercialization of microbial **(Biotech) technology**, Govt. regulations, Entrepreneurship – Developing a business plan, basic concept of financial, management, major financial statement – over view of Human resource management.

Legal and statutory requirements, Marketing, Negotiation skills, Rural and Women entrepreneurship. Patenting and intellectual property rights

Non-Core Elective Paper

PHY 15307: ADVANCED ANALYTICAL INSTRUMENTS

Unit I: Spectroscopic Measurement Techniques

Introduction to Spectroscopy – Properties of Electromagnet Radiation – EM Spectrum – Beer's law – Absorptivity – UV and visible absorption- Essential parts of Spectrophotometer- Gratings and prisms – Radiant energy sources – filters – detectors- Photomultiplier tubes -Instrumentation –Single Beam, Double Beam Spectrophotometer-Applications.

Unit II: Bio-physical Measurement Techniques

Principles of blood pressure equipment, glucometer, Ultrasonography, cardiovascular measurement circulatory systems of heart- ECG anatomy and function of heart. Generation of X-rays -X-ray diffractograph- CT- Scan -Applications - Introduction to nuclear magnetic resonance, NMR – Chemical shift – spin – spin coupling _Instrumentation- Magnetic resonance Imaging (MRI)

Unit III: Weather Measurement Techniques

Introduction to Tropical Weather, Climate, Lighting, Cyclones and Monsoons. Climatic Station, Rain gages, Automatic Weather Station, Global Positioning System, Radisonde, Radar and weather Satellites

Unit IV : Air pollutions Measurement Techniques:

Introduction to Greenhouse Effect -Enhancement of the Greenhouse Effect;

Primary gaseous pollutants (CO_2 , CH_4 , CO AND NO_x)- sources and their effects on climate/human health. Secondary gaseous pollutants (Ozone and PAN)- Formation and their effects on human health.

Gaseous pollutants measurement techniques – principles, block diagrams and working.Effects of aerosols on climate and human health. Measurement techniques- direct measurements by sampling and remote sensing measurement by Multi wave solar radiometer and LIDAR.

Source: The relevant material of the above units must be down loaded from authenticated web location from <https://www.google.com>

CLINICAL PSYCHOLOGY

Unit I: Foundations of Clinical Psychology

Definition and scope of Clinical Psychology - History of Clinical Psychology, Current status and Professional issues- Methods of Clinical Psychology.

Unit II: Models of Clinical psychology

Models of Clinical psychology- five models of clinical psychology (Psycho-dynamic/ cognitive/behaviorist/ humanist/ gestalt-based and systematic

Unit III: Major clinical disorders

Clinical child Psychology: **Clinical issues**, Behavioural Disorders, Emotional Disorder, Developmental and Learning Disorder – Clinical **Neuro-psychology**:- Symptômes and Syndromes; **Delirium**, **Dementia**, Amnesic syndrome, Neuro-psychological Delusional syndrome, Neuro-psychological syndrome, Neuro-psychological disorder with HIV – 1 infections.

Unit IV: Clinical Assessment and Psycho diagnostics

Signs and symptoms of Mental disorders; **Intellectual Assessment**; Personality Assessment; **Neuropsychological Assessment**; **Clinical interviewing and testing**. Psycho-diagnostics- intake/ an amnesia - developing hypotheses - selecting criteria and materials (tests, questionnaires, observations etc.)

Readings:

- Diagnostic and Statistical Manual disorders: 4th edition (2000) Washington, D.C.: American Psychometric Association.
- A. Hecker, J.E. & Thrope, G.L. (2005) Introduction to clinical Psychology: Science, Practice and Ethics, Delhi; Pearson Edn.
- B. Kendall, P.C. & Norton – Ford, J.D. (1982) Clinical Psychology Scientific and Professional Dimension: Chichester. John Wiley.
- C. Nietzel M.T., Bernstein, D.A., & Milich R. (1998) Introduction to clinical Psychology 5th edition, Trentice Hall, New Jersey.
- D. Prabhu G.G. (1983) Then Now India Journal of Clinical Psychology.
- E. The ICD -10 classification of Mental and Behavioural disorders. Clinical Descriptions and diagnostic guidelines (1992) W.H.O. Geneva.

COUNSELLING PSYCHOLOGY-I

Unit I : Introduction to Counseling

Concept and Definition of Counselling – Counselling as helping profession and related fields – Guidance , Psychotherapy, Clinical Psychology and Social work - Factors contributing to the emergence of Counselling- History of counselling movement- Present status of Counselling in India

Unit II : Goals , Characteristics and Types

Goals and expectations of Counselling – Roles and functions of counselor - The characteristics of an effective counselor- counselor skills- Characteristics of a Counselee – Developmental determinants, tools of counseling – Types of Counselling – Individual / Group counselling.

Unit III: Counseling process and Counselling Techniques

Phases of Counseling-Client- Counselee Relationship- Counseling setup (Influence of external conditions) Individual skills-Group Counseling-Dealing with Specific situations.

Unit IV: Legal and Ethical Considerations in Counselling

Conflicting responsibility – Confidentiality- Competence and representation and ethics in research – legal considerations- the legal recognition of counselors – Privileged communications – Expert Testimony and liability for negligence or malpractice.

Reference:

- Bhatnagar, A & Gupta, N .(1999). **Guidance and Counselling. A Theoretical perspective.** Vikas Publishing House: New Delhi.
- Gibson, R.L & Mitchell, M.H. (2006). **Introduction to Counselling and Guidance.** Prentice Hall of India Ltd., : New Delhi.
- Nelson, Richard Jones. (2011). **Theories and Practice of counseling Therapy.** 5th Edition. Sage Publications: New Delhi.
- Richard nelson jones (2008) **Basic counseling skill's a Helpers manual.** 2nd edition. New Delhi:Sage Publications India limited.
- S. Naryana Rao (1997) **Counselling and Guidance.** Tata Mc. Graw-Hill.

33005: Artificial intelligence

UNIT 1:

Problems and Search: What is Artificial Intelligence?, The AI Problems, The Underlying Assumption, What is an AI Technique, The Level of the Model, Criteria for Success.

UNIT 2:

Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search, Production systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs.

Heuristic Search Techniques: Generate and Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means Ends Analysis.

UNIT 3:

Knowledge Representation:- Knowledge Representation Issues, Representations and Mappings, Approaches to knowledge Representation, Issues in Knowledge Representation.

UNIT 4:

Using Predicate Logic:- Representing Instance and Isa Relationships, Computable Functions and Predicates, Resolution, Natural Deduction.

Representing Knowledge Using Rules:- Procedural Versus Declarative knowledge, Logic Programming, Forward versus Back ward Reasoning, Matching, Control Knowledge.

TEXT BOOK:

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Tata McGrawHill

REFERENCE:

1. Artificial Intelligence – A modern approach, Stuart Russel, Peter Norwig, Pearosn Education.

53002: Cloud Computing

UNIT 1:

Systems modeling, Clustering and virtualization: Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency

UNIT 2:

Virtual Machines and Virtualization of Clusters and Data Centers: Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Center Automation.

UNIT 3:

Cloud Platform Architecture: Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

UNIT 4:

Cloud Programming and Software Environments: Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

TEXT BOOKS:

1. Distributed and Cloud Computing, Kai Hwang, Geoffry C. Fox, Jack J. Dongarra MK Elsevier.
2. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
3. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madiseti, University Press

REFERNCE BOOK:

1. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH
2. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammarai selvi, TMH

BCH 4: Cell Biology & Physiology

Unit I

Structural organization of prokaryotic and eukaryotic cells, Plant and animal cells – variation in structure and function, Types of tissues – Epithelial tissues, basement membrane, extracellular matrix, Chromatin organization, telomere, centromere, Ultrastructure and functions of nucleus, mitochondria, plastids, endoplasmic reticulum, Golgi complex, lysosomes, microbodies, ribosomes. Cytoskeleton – microtubules and microfilaments.

Unit II

Cell division by mitosis and meiosis, cell cycle and its regulation, cell receptors, endocytosis and exocytosis. Bio-membranes - composition of Membranes. Membrane lipids, proteins and carbohydrates. Molecular structure of membranes, fluid mosaic model of biological membranes. **Membrane transport:** Active transport, Active transport of Na⁺ K⁺(sodium potassium ATPase) Ca²⁺ (Ca²⁺ - ATPase).

Unit III

Basic concepts of cell signaling and transduction, different signaling molecules, second messengers, calcium, calmodulin, inositol phosphate, cAMP, cGMP, NO. Signal cascades. Introduction to physiology. Homeostasis. Excretory System: **Kidneys** – Glomerular filtration, tubular function, formation of urine, regulation of water and mineral balance.

Unit IV

Digestive system: Various regions of digestive system. Gastrointestinal secretions-composition, function of saliva, gastric, pancreatic, intestinal and bile secretions. Regulation of gastrointestinal function.

Circulatory System: Blood composition, **Heart**-Structure. Electrical activity, **Heartbeat**, **Arterial system**, micro circulation and lymphatics, cardiac cycle and cardiac output, control of circulation.

Respiratory system: Mechanics of respiration, gas exchange in the lungs, control of breathing.

Recommended Books:

1. Molecular Biology of the cell by Alberts *et al.*
2. Cell and Molecular Biology by EDP de Robertis and EMF de Robertis.
3. Cell and Molecular Biology 2nd Ed. By P.K. Gupta, Rastogi Publ.
4. Molecular Genetics by D Friefelder
5. Cell molecular biology, albert Bruce
6. Gene VII by Lewin
7. Molecular cloning by Maniatis and Co Vol I, II, III
8. Genetics by Gardner
9. Genetics by Suzuki
10. Molecular genetics by klug and Cummings
11. Cell and Molecular Biology 2nd Ed. by P.K. Gupta, Rastogi Publ.

Programme: M. Sc., Biotechnology
Course Title: *Medical and Pharmaceutical biotechnology*
Type of Course: Core
Course No.: 35082
Semester: III

UNIT-I

Medical biotechnology- History, Definition, applications and uses of recombinant DNA technology Products like “Insulin, growth factor, factor- VIII, tissue plasminogen activator, interferons, B-cell, Blood products-Erythropoietin”

UNIT – II

Disease Diagnosis - *Gene therapy*- vector engineering and gene delivery methods, gene replacement, gene augmentation, gene silencing. Current strategies for development of vaccines against HBV, Malaria, Tuberculosis. Role of *PCR* and RFLP in disease prognosis

UNIT – III

Definition – history of development of pharmaceutical products by biotechnology, scope of biotech products in pharmaceutical industry. *Drug designing*, drug receptor interactions, antagonism- reversible and irreversible.

UNIT-IV

Vaccines- Genetic recombinant vaccine, recombinant vector based vaccines- live, subunit and their production of Hepatitis-B vaccines, HIV vaccine, pre clinical, toxicological acute, sub acute and chronic studies, types of clinical trials Phase-I, Phase-II and Phase III.

BOOKS RECOMMENDED:

1. Biotechnology by B.D.Singh (Kalyani).
2. Molecular Biology and Biotechnology by Meyers, RA, A comprehensive Desk reference (VCH Publishers).
3. Biotechnology by U. Satyanarayana (Books & Allied (P) Ltd).
4. Biopharmaceuticals-Walsh, John Willey and Sons, New York 1998
5. Pharmaceutical Biotechnology – Daan J.A. Crommelin, Robert D. Sindelar, Daan J.A. Crommelin Amazon. WM
6. Physical Methods to characterize Pharmaceutical Protines- James N. Herron, Wim jishkooor and Daan J.A. Crommelin Amazon. Wm
7. From clone to clinic (Developments in Biotherapy) Daan J.A. Crommelin and H. Schellekom Amazon.Wm
8. Hand Book of Pharmaceutical Biotechnology - Jay P.Rho, Star 4 Ionie The Haworth press, Alice Sr. Bringhamtoon, NY 13904, US Tramas bartifai, Harold L. Dorn’s

Programme: M. Sc., Biotechnology

Course Title: Genetic engineering and Medical and Pharmaceutical Biotechnology

Type of Course: Practical

Course No.: 35081P

Semester: III

1. Total genomic DNA isolation from plants
2. Restriction enzyme analysis of genomic DNA
3. Preparation of competent cells - calcium chloride method
4. Bacterial Transformation
5. Plasmid isolation from *E.coli*
6. Restriction mapping of Plasmid
7. Colony PCR
8. Bacterial transformation
9. Fragment isolation and ligation
10. Selection of recombinants (Blue / white selection)
11. Total protein isolation, SDS PAGE / Native PAGE and Western Blotting
12. Sterilization By Autoclaving And Test For Sterility
13. Sterilization By Dry Heat And Test For Sterility
14. Sterilization By Heating With Bactericide And Test For Sterility
15. Test For Presence Of Fungi In Tap Water
16. Immobilization Of Microbial Cells By Entrapment In Sodium Alginate
17. Bioinformatic software-Hex
18. Bioinformatic software -Rasmol
19. Drug Receptor interactions (Molecular docking)
20. DNA Finger printing for disease diagnosis

Programme: M. Sc., Biotechnology

Course Title: Food and Industrial Biotechnology and Bioprocess Technology

Type of Course: Practical

Course No.: 35082P

Semester: III

1. Media preparation and sterilization (plant and microbe)
2. Isolation of industrially important microorganisms from different sources
3. Development of inoculums for industrial fermentation (Bacterial and mycelial)
4. Recovery and purification of fermentation products
5. Preparation of wine
6. Production of citric acid
7. Design of a fermentor
8. Types of bioreactors
9. Design of a typical aerobic fermenter
10. Preservation of industrially important microorganisms
11. Isolation of amylase producing microorganism from soil
12. Lethal effects of temperature on microorganisms (TDP)

25011 - Plant Developmental Biology

Unit- I: Morphogenesis and Organogenesis in plants

Organization of Shoot Apical Meristem (SAM) and Root Apical Meristem (RAM), Shoot and root development, Leaf development and phyllotaxy. **Dermal tissue system** - types of trichomes and stomata. **Vascular tissue system** - types of vascular bundles. Primary growth of root and stem, secondary growth in dicot stem, root and monocot stem. **Anomalous secondary growth** - abnormal position and activity of cambium, intraxylary and interxylary phloem, Wood anatomy, wood development in relation to environmental factors

Unit- II: Hormonal regulation of plant development

Overview of **plant hormones**. **Auxins**: discovery, structure, biosynthesis, developmental role and mode of action. **Gibberellins**: discovery, structure, biosynthesis, developmental role and physiological effects (effects on growth and development). **Cytokinins**: structure, types and biological roles of cytokinins. **Abscissic acid**: occurrence, chemical structure and physiological effects. Ethylene, brassinosteroids, polyamines, jasmonic acid and salicylic acid.

Unit- III: Environmental regulation of plant development

Structure, function and mechanism of action of phytochrome, cryptochrome and phototropins; scotomorphogenesis and photomorphogenesis. **Ecological anatomy**: Adaptations in Hydrophytes, mesophytes and xerophytes, anatomy in relation to taxonomy: Hairs, stomata, epidermal cells, **microchemistry**: crystals, cystoliths, laticiferous tissue. Bicollateral vascular bundles, wood.

Unit-IV: Programmed Cell Death and Senescence

Concept of **PCD**, categories of cells undergo PCD during vegetative and reproductive stages, mechanism of PCD, developmental and stress induced PCD. Overview of plant senescence, patterns of senescence, **physiological changes during senescence**: photosynthesis, respiration, nitrogen fixation, protein and nucleic acids, environmental, biochemical, and molecular aspects of senescence. Environmental influence on senescence.

Suggested Practical's:

1. Study of important fossil (pteridophytes and gymnosperms) from prepared slides and specimens.
2. Study of T.S. of stem, root and leaf
3. Study of secondary growth in angiosperms
4. Study of anomalous structures in angiosperms
5. Study of dermal tissue system and vascular tissue system
6. Wood anatomy, T.S, T.L.S, and R.L.S

Note: Every student has to submit at least five permanent slides at the time of practical examination.

45011 - Plant Tissue Culture

Unit- I: Basics of plant tissue culture technique

Historical aspect and landmarks in plant tissue culture, concept of cellular totipotency and cellular differentiation, basic techniques in plant tissue culture, formulation of media for plant tissue culture, cultural conditions, physiological, biochemical and molecular role of mineral, carbohydrate and growth regulators in differentiation of organs under *in vitro* conditions.

Unit-II: Pathways of *in vitro* regeneration (Vegetative explants)

In vitro regeneration methods: Micropropagation, organogenesis (direct and indirect), somatic embryogenesis; Problems of tissue culture: contamination, phenolics, recalcitrance; Genome reorganization induced *in vitro*, somaclonal and gametoclonal variations; problems in establishment of regenerated plants in nature, hardening of plants.

Unit- III: Pathways of *in vitro* regeneration (reproductive explants) and protoplast culture

Gametic embryogenesis (androgenesis and gynogenesis), doubled haploids, culturing of ovary, ovule, nucellus, embryo, embryo rescue, triploid production, somatic hybridization; protoplast isolation, fusion and culture, hybrid selection and regeneration, possibilities, achievements and limitations of protoplast regenerants.

Unit- IV: Application of Plant Tissue Culture

Meristem culture for production of virus free plants, artificial seeds, production of secondary metabolites from cell suspension culture and hairy root culture, elicitors, plant cell reactors-bio reactors culture of isolated single cell, role of tissue culture in gene transfer, cryopreservation and germplasm storage.

Suggested Practicals

1. Preparation of different types of Media
2. Callus induction from carrot cambial explants or any other source. Callus cytological studies
3. Induction of Somatic Embryogenesis
4. Suspension Cultures
5. In vitro rooting of cultures
6. Culture of anthers for production of haploids
7. Induction of multiple shoots
8. Preparation of artificial seeds by sodium alginate.

Suggested Readings

1. Razdan, M.K. 2014. Introduction to Plant Tissue Culture (Second edition). Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
2. Bhojwani, S.S. 1990. Plant Tissue Culture Applications and Limitations: Elsevier, New York
3. Bhojwani, S.S. and M.K.Razdan 1996. Plant Tissue Culture. Theory and practice (rev. ed) Elsevier Science Publishers, New York.

25013 - Plant Ecology and Environment

Unit- I: Ecology and Environment

Definition, Scope and History of Ecology; climatic and topographic factor; physical environment and plant life- light, temperature and fire factors and biotic environment; Ecosystem-structure and function; energy flow in ecosystems-concept of productivity, **types of food chains**; Biogeochemical cycling- global carbon cycle, sulphur and water cycle; Ecosystems of the world-terrestrial (tropical forests-seasonal and rainforests; grasslands) and aquatic ecosystems.

Unit- II: Plant Communities and Classification

Characteristics of plant communities; analytic-qualitative (life forms, phenology), and quantitative (abundance, density, frequency, basal area); synthetic-species dominance and species diversity. Methods of study of plant communities- quadrats and transects; Importance Value Index, dominance index, similarity index, species diversity indices; community succession-process and modeling; concept of climax. Ecological adaptations.

Unit- III: Populations and Individuals

Characteristics of plant populations-density, dispersion, natality, mortality and survival, age structure and biotic potential; population growth patterns; population regulation; concept of metapopulation; Population dynamics. Species interactions: plant-plant (inter-specific competition) and plant-animal (pollination ecology and plant defense against herbivores); concept of ecological niche.

Unit- IV: Environmental Challenges

Natural resources, **Classification of natural resources**. Energy resources: Renewable energy resources-solar energy, wind energy, hydeal energy, thermal energy, bio energy. Non-renewable energy resources-fossil fuels; coal, natural gas, petroleum. Environmental pollution; sources, effects and control measures of air pollution, water pollution, soil pollution and noise pollution. Global warming-greenhouse gases, impacts on global environment and biodiversity; Ozone layer depletion; El Nino Southern Oscillation, La Nino; Earth Summit – 1992 (RIO DE JANERIO) and 2002 (JOHANNESBURG) and its outcome. Bioremediation. Environmental Impact Assessment (EIA).

Suggested Practical's:

1. Determination of texture of different soil samples.
2. Determination of organic matter in soil samples.
3. Determination of salinity in soil and water samples.
4. Estimation of dissolved oxygen in water samples.
5. Determination of minimum size of quadrates.

35013 - Tools and Techniques in Plant Science and Biostatistics

Unit-I: Microscopic, histochemical and radioisotope techniques

Microscopy: Principles and application of light, phase contrast, fluorescence, scanning and transmission electron microscopy. **Microtomy and staining:** Microtomy and double staining of plant sections. **Radioisotope Techniques:** Types of isotopes, radioactive decay. **Detection and measurement of radioactivity-** GM counter, scintillation counter, autoradiography. Isotopes used in biology, safety methods in handling radioisotopes.

Unit-II: Electrophoresis and Centrifugation methods

Polyacrylamide gel Electrophoresis: Native-PAGE, SDS-PAGE. **2D-Electrophoresis:** Isoelectric focusing, 2D Electrophoresis. **Agarose Gel Electrophoresis:** Preparation, separation and determination of molecular size of DNA, denaturing agarose gel electrophoresis and their applications. **Centrifugation types:** differential centrifugation, density-gradient, analytical, and ultracentrifugation and their applications

Unit-IV: Spectroscopy and Chromatography Techniques

Spectroscopy: Laws of light absorption: Beer and Lamberts, **Instrumentation and applications:** UV- visible spectrophotometer, NMR and ESR spectroscopy, Mass Spectroscopy. **Chromatography: Principle, instrumentation, practical procedure and applications of:** Paper chromatography, thin-layer chromatography, gas-liquid chromatography, High-performance liquid chromatography (HPLC).

Unit-IV: Biostatistics

Introduction, role of statistics in botanical research, collection of data, tabulation. Statistical tools: **Variables:** qualitative variables and quantitative variables, measurement of variables. Frequency distribution, **Measures of Central Tendency:** Arithmetic mean, Median, Mode, Average, Percentage. **Measures of Dispersion:** Mean Deviation, Variance and Standard deviation, Coefficient variation. **Probability;** measures of probability, laws of probability. **Probability Distributions:** Binomial, Poisson, Normal and 't' distribution. Regression and Correlation, The Chi-Square test, Analysis of Variance (ANOVA). Non-Parametric statistics: Advantages and disadvantages of Non-Parametric statistics.

Suggested Practical's:

1. Micrometry- calibration of microscope using stage and ocular micro meters
2. Preparation of plant material for microtome sections and double staining
3. Separation of proteins by PAGE
4. Separation of nucleic acids by Agarose gel electrophoresis
5. Absorption spectra of amino acids, Proteins and nucleic acids
6. Isolation and spectrophotometric characterization of plant pigments
7. Verification of Beer's law
8. Statistical problems

Suggested Readings:

SEMESTER - III: ELECTIVE - II: (Non-core) Herbal Medicine

UNIT – I: Ethnobotany

Introduction, history, scope and importance, Inter disciplinary approaches in Ethnobotany. Study of Medicinal, Edible and Miscellaneous plants used by the Tribes. **Breif account on Indian medicine:** Ayurveda, Homeopathy, Unani and Siddha. Study of locally available medicinal plants and their thereupetic values (*Adathoda*, *Gymnema*, *Andrographis*, *Rauwolfia*, *Ocimum*).

UNIT – II: Pharmacognosy

Introduction, history and scope of Pharmacognosy. Drugs of alkaloids, glycosides, phenolics, antibiotics, psychoactive and poisonous plants. **Study of important medicinal plants:** Amla, Aswagandha, Aloe, Brahmi, Kesar. **Classification of drugs** - Alphabetical, Morphological (Organized and unorganized), Taxonomical, Chemical, Pharmacological, Chemotaxonomical and **drug evaluation** - morphological, microscopic, physical, chemical and biological evaluation. Genetic engineering of medicinal plants.

UNIT III: Herbal Cosmetics

Uses of herbal cosmetics like emulsifiers (fixed oils, waxes, butters), moisturizing agents, colours, perfumes, and fragrances, bleaching agents, preservatives, antioxidants, chelating agents, skin lotions, sunscreens, dyes, **anti aging creams**, deodarants, nail polishes, hair oils, soaps, shampoos, nail polishes and lipsticks.

UNIT IV: Medicinal plants

Formulation and standardization of various herbal cosmetic products, Henna, Turmeric, Sandalwood, Neem, Coconut, Rice, Holy basil, Red sandal wood, Camphor, Jaboba. Drugs for digestive disorders – *Withania somnifera*. Memory stimulants – *Centella asiatica*, *Bacopa monnieri*. Drugs for dissolving kidney stones – *Musa paradisiaca*. **Antiinflammatory drugs** – *Cardiospermum*. **Anticancer drugs** – *Catharanthus roseus*.

Suggested Readings:

1. Harborne, J. B. 1948. Phytochemical Methods (Ed.) Chapman and Hall, London.
2. Khare, C. P. 2000. Indian Herbal Therapies. Delhi Book Co., M-Connaught, Circus, New Delhi.
3. Kokate, C. K. Purohit, A.P. Gauchely, S.B. 1990. Pharmacognosy, Narial Prakashan, India.
4. Jain, S.K. 1995. Mannual of Ethnobotany, Scientific Publishers, Jodhpur.
5. Wallis, T. E. 1999. Text Book of Pharmacognosy, (5th Ed.) CBS Publishers & Distributions, New Delhi.
6. Singh, M. P. and Panda, Himadri 2005. Medicinal herbs with their formulations. Volume 1 & 2. Daya Publishing House, Delhi.
7. Herbal cosmetics, hand book By H. Panda
8. Kumar, N.C. (1993). An Introduction to Medical botany and Pharmacognosy. Emkay Publications, New Delhi.
9. Rao, A.P. (1999). Herbs that heal. Diamond Pocket Books (P) Ltd., New Delhi.
10. Gokhale, S.S., C.K.Kokate and A.P. Purohit (1994) Pharmacognosy. Nirali Prakashan. Pune.
11. Tyagi, Dinesh Kumar (2005) Pharma Forestry. Field Guide to Medicinal Plants. Atlantic Publishers and Distributors, New Delhi.

General consideration, costing on electrolytic process, electrolysis parameters, principles of cell design and the addition technology of electrolysis process and typical cell design. Cyclic voltammetry and its applications.

Books Suggested

1. Physical Chemistry, P. W. Atkins, (ELBS)
2. Introduction to quantum Chemistry, A. K. Chandra (Tata McGraw Hill)
3. Quantum Chemistry, Ira N. Levine, (prenticxe Hall)
4. Coulson's Valence, R. Mcweeny, (ELBS)
5. Modern Electrochemistry, vol. I & II, J. O. M. Bockris and A. K. N. Reddy (Plenum)
6. An Introduction to Electrochemistry (3rd ed.), S. Glasstone (Affiliated East-West)
7. Micelles, theoretical and applied aspects, V. Moroi (Plenum)
8. A text Book of Physical Chemistry (2nd Ed.), S. Glasstone (Macmilan)
9. Principles of Physical Chemistry, Maron and Prutton
10. Theoretical Electrochemistry, L. I. Antropov.

25034: CHROMATOGRAPHY AND NATURAL PRODUCTS

UNIT – I: Chromatography

15Hrs

Definition, classification, partition or distribution coefficient, partition ratio, efficiency, resolution, plate height, plate number, theories of chromatography: plate theory, rate theory, band broadening; principle and applications of paper chromatography, thin layer chromatography, column chromatography, size exclusion chromatography, ion exchange chromatography.

UNIT – II: HPLC and GC

(A) **High Performance Liquid Chromatography (HPLC)**: Principle, Instrumentation, isocratic, gradient and stepwise elution, Mobile phase delivery systems, Separation columns, detectors and Applications.

(B) **Gas Chromatography (GC)**: Principle, Instrumentation, GC columns, Detectors and Applications of GC.

UNIT – III: Terpenoids

15 Hrs

Occurrence, isolation, general methods of structure determination, isoprene rule; structure determination, stereochemistry, biosynthesis and synthesis of camphor, farnesol, zingiberene, cadinene, abietic acid and lanosterol.

UNIT – IV: Alkaloids

15 Hrs

Introduction, isolation, general methods of structural elucidation and physiological action, degradation, classification based on nitrogen heterocyclic ring, structural elucidation, stereochemistry and synthesis of morphine, papaverine and reserpine, biosynthesis of alkaloids.

Books Suggested

1. Physical and Chemical Methods of Separation, E. W. Berg (McGraw Hill).
2. Separation Process Principles, J. D. Seader and E. J. Henley (John Wiley & Sons Inc).
3. Instrumental Methods of Analysis, H. W. Willard, L. L. Merritt and J. A. Dean (Affiliated East-West)
4. Vogel's Text Book of Quantitative Chemical Analysis, J. Mendham, R. C. Denney, J. D. Barnes and M. J. Thomas, 4th & 6th Ed. (Pearson Education Asia).
5. Principles of Instrumental Analysis, D. A. Skoog and D. M. West (Holt, Rinehart and Wilson)
6. Natural Products: Chemistry and Biological Significance, J. Mann, R.S. Davidson, J. B. Hobbs, D. V. Banthrope and J. B. Hatrbnome, Longman, Essex.
7. Organic Chemistry, Vol. 2, I. L. Finar, ELBS.

9. Text book of practical organic chemistry including qualitative organic analysis by A.I. Vogel (Longman).
10. Advanced Medicinal Chemistry, M. Raghu Prasad and A. Raghuram Rao (Pharma Med Press).

25035N: BASICS OF CHEMISTRY

UNIT – I: Basics of Organic Chemistry

UNIT – II: Basic Parameters in Sample Preparation

UNIT – III: Basics of Bioinorganic Chemistry

UNIT – IV: Basics of Polymer Chemistry

UNIT – I: Basics of Organic Chemistry

15 Hrs

Hybridization in organic compounds; dipole moment; inductive effect; electromeric effect; conjugation and resonance; homolysis; heterolysis; types of organic reactions; isomerism; introduction to reactive intermediates; classification of isomerism; stereochemistry of organic compounds – *E&Z* and *R&S* nomenclature

UNIT – II: Basic Parameters in Sample Preparation

15 Hrs

Definition and calculation of substance in moles and millimoles; solutions and their concentrations: definition of solution, solute and suspension, weight percentage, volume to volume percentage, mole fraction, mole percentage, molarity, molality, normality; density and specific gravity; conversion of weight/moles to volume using density; compound empirical and molecular formulae.

UNIT – III: Basics of Bioinorganic Chemistry

15 Hrs

Essential and trace elements – role of metal ion in biological process; Na^+/K^+ pump; photosynthesis – structure of chlorophyll, photosynthetic mechanism in bacteria and in green plants (*Z*-scheme, PS-I & PS-II); respiration (transport and storage of dioxygen) – structure and function of myoglobin, hemoglobin, hemerythrin and model systems.

UNIT – IV: Basics of Polymer Chemistry

15 Hrs

Terminology: monomers, repeat units, degree of polymerization, linear, branched and network polymers, classification of polymers.

Synthetic methods: Condensation, addition, radical chain, ionic and coordination, copolymerization.

Applications: biomedical and industrial applications

Books Suggested

1. Organic Chemistry, Paula Yurkanis Bruice, 4th Ed. (Printice Hall).
2. Mechanism and Theory in Organic Chemistry, Thomas H. Lowry, Kathleen S. Richardson, Harper & Row, (Publishers, Inc.).
3. Analytical Chemistry, G. D. Christian, 5th Edition, John Wiley & Sons.
4. Bioinorganic Chemistry, R. W. Hey, Ellis Horwood Ltd., Chichester, New York
5. Bioinorganic Chemistry, K. Hussain Reddy, New Age International Publisher, New Delhi.
6. Text Book of Polymer Science, F. W. Billmeyer, Jr. (Wiley Inter Science).
7. Polymer Chemistry, Gowarikar.

8. A Complete Introduction to Modern NMR Spectroscopy, Roger S. Macomber, (John Wiley & Sons, Inc.).

35031P: Multistep Synthesis of Organic Compounds:

1. Benzanilide from **Benzophenone**
Benzophenone → Benzophenone oxime → Benzanilide
2. Benzilic acid from benzoin
Benzoin → Benzil → Benzilic acid
3. *p*-Bromoaniline from **Acetanilide**
Acetanilide → *p*-Bromoacetanilide → *p*-Bromoaniline
4. Flavone from ***o*-hydroxyacetophenone**
o-hydroxyacetophenone → *o*-benzoyl acetophenone → *o*-hydroxydibenzoylmethane → Flavone
5. 2-Acetylnaphthalene → 4-(naphthalen-2-yl)thiazol-2-amine
2-Acetylnaphthalene → 2-bromo-1-(naphthalen-2-yl)ethanone → 4-(naphthalen-2-yl)thiazol-2-amine

35032P: Estimations

1. Estimation of glucose
2. Estimation of phenol
3. Estimation of aniline
4. Estimation of aspirin
5. Estimation of paracetamol
6. Estimation of ibuprofen

Books Suggested

1. Modern Organic Synthesis in the Laboratory *A Collection of Standard Experimental Procedures*, Jie Jack Li, Chris Limberakis, Derek A. Pflum
2. Practical organic chemistry by Mann & Saunders
3. Text book of practical organic chemistry by Vogel
4. Spectrometric Identification of organic compounds, R.M. Silverstein, F.X. Webster and D.J. Kiemle, 7th Ed., (Wiley).

35031N: DRUG DISCOVERY, DESIGN AND DEVELOPMENT

UNIT – I: Basic Principles of Pharmacology

UNIT – II: Lead Discovery and Optimization

UNIT – III: SAR and QSAR Studies

UNIT – IV: Common Drugs

UNIT – I: Basic Principles of Pharmacology

15 Hrs

Definitions: disease, drug, bioassay, pharmacokinetics and pharmacodynamics, stages involved in drug discovery, formulation, drug dosing, routes of drug administration,

Pharmacokinetics: absorption, distribution, metabolism and excretion of drugs (ADME), drug delivery.

Pharmacodynamics: nature of drug - receptor interactions, theories of drug action: occupancy theory, rate theory, induced-fit theory, macromolecular perturbation theory.

Drug synergism and antagonism, drug toxicity, clinical trials.

UNIT – II: Lead Discovery and Optimization

15 Hrs

(B) Other approaches to Synthetic Strategies

- (i) Biomimetic approach: introduction, Robinson's tropinone synthesis, Johnson polyene cyclization
- (ii) Chiral template approach: introduction, synthesis of reserpine
- (iii) Retro-mass spectral approach – introduction, Kametani's mass spectral analysis of tetrahydroisoquinoline alkaloids.

UNIT – IV: Methods in Organic Synthesis**15 Hrs**

Enamines – Introduction, generation, Stork enamine reaction, applications of enamines in organic synthesis; **Multi component reactions (MCR)** – Introduction, Strecker synthesis, Ugi reaction, Mannich reaction, Biginelli reaction, and Hantzsch synthesis; Tandem Synthesis – Definition, advantages, polyene cationic cyclizations, conjugate addition-aldol reaction, Mannich-cation olefin cyclization, Knoevenagel-hetero-Diels-Alder reaction.

Books Suggested:

1. Designing Organic Syntheses: A Programmed Introduction to the Synthron Approach, S. Warren, John Wiley & Sons.
2. Organic Synthesis: Strategy and Control, P. Wyatt and S. Warren, John Wiley & Sons.
3. Organic Synthesis: The Disconnection Approach, 1st & 2nd Ed.s, S. Warren and P. Wyatt, John Wiley & Sons.
4. Organic Synthesis: Concept, Methods and Starting Materials, J. Fuhrhop and G. Perzillin, (Verlage VCH) 2nd Ed., 1994.
5. Organic Synthesis, M. B. Smith, 4th Ed., Elsevier, 2017.
6. Advanced Organic Chemistry: Part A & B, F. A. Carey and R. J. Sundberg, 5th Ed., Springer, 2007.
7. Some Modern Methods of Organic Synthesis, W. Carruthers, 3rd Ed., (Cambridge Univ. Press).
8. Introduction to Strategies for Organic Synthesis, L. S. Starkey, John Wiley & Sons, 2012.
9. Organic Chemistry, Paula Yurkanis Bruice, 4th Ed. (Printice Hall).
10. Modern Synthetic Reactions, H. O. House, 2nd Ed., (W.A. Benjamin).
11. Multi-component Reactions: J. Zhu and H. Bienaymé (Wiley-VCH).

45033: CHEMISTRY OF HETEROCYCLIC COMPOUNDS**UNIT – I: Nomenclature, Aromaticity and Reactivity of Heterocyclic Compounds****UNIT – II: Three- and Four-membered Heterocyclic Compounds****UNIT – III: Five-membered Heterocyclic Compounds with Two Heteroatoms****UNIT – IV: Benzofused Five- and Six-membered Heterocyclic Compounds****UNIT – I: Nomenclature, Aromaticity and Reactivity of Heterocyclic Compounds****15 Hrs****(A) Nomenclature of Heterocycles**

Systematic nomenclature (Hantzsch-Widman system); trivial system; fusion nomenclature system; replacement nomenclature system; Monocyclic heterocycles, fused heterocycles, spiroheterocycles; bridged heterocycles; bicyclic systems; polycyclic systems; heterocyclic ring assemblies.

(B) Aromaticity of Heterocycles

Chemical behavior of aromatic heterocycles; five and six-membered aromatic heterocycles and mixed aromatic heterocycles; relationship with carbocyclic aromatic compounds; criteria of aromaticity in heterocycles; structural and electronic criteria.

(C) Reactivity of Heteroaromatics

Selectivity and reactivity of heteroaromatic rings: five- and six-membered heterocyclic system.

UNIT – II: Three- and Four-membered Heterocyclic Compounds**15 Hrs****(A) Three-membered Heterocycles**

Synthesis and chemical reactivity of aziridines, oxiranes, oxaziridines and thiiranes.

45031P: Spectral Identification of Organic Compounds (UV, IR, ¹H- and ¹³C- NMR and Mass)

Composite spectral problems in three modes, 10 examples in each mode

- (A). Propose the structures for compounds that fit the given spectral data and assign the spectral values.
(B). For the given scheme and spectroscopic data, deduce the structure of compounds I, II and III, and assign the data.
(C). Extract data from the given spectra and elucidate the structure from the obtained data with appropriate discussion.

Books Suggested

1. Organic spectroscopy, W. Kemp, 5th Ed., (ELBS.2)
2. Spectrometric Identification of organic compounds, R.M. Silverstein, F.X. Webster and D.J. Kiemle, 7th Ed., (Wiley)
3. Introduction to Spectroscopy, A guide for students of organic chemistry, Donald L. Pavia, Gary M. Lampman and George S. Kriz, 3rd Ed., (Thomson).

45032 P: Project Work

Students must do a research based project and submit a dissertation for evaluation. Further, a final presentation of dissertation work and viva need to be conducted.



204: RESEARCH METHODOLOGY FOR BUSINESS

Objective: The objective of this paper is to make the students familiar with the Research and Statistical Techniques and their applications in business decision making.

UNIT-I: Introduction to Research: Features and Importance of Research in Business - Objectives - Types of Research: Basic, Applied, Descriptive, Analytical and Empirical Research; Formulation of Research Problem - Research Design - Significance of Review of Literature; Hypothesis: Formulation – Importance - Types; Sampling: Significance – Methods - Factors Determining Sample Size. (Theory only)

UNIT-II: Research Process: Stages in Research Process; Data Collection: Primary Data – Observation - Experimentation - Interview - Schedules - Questionnaire: Types - Steps in Questionnaire Designing - Essentials of a Good Questionnaire - Survey - Limitations of Primary data; Secondary data - Sources – Limitations - Factors Affecting the Data Collection Choice (Theory only)

UNIT-III: Data Processing and Statistical Analysis: Data Processing - Significance in Research – Editing – Coding - Classification - Tabulation - Graphical Presentation; Statistical Tools and Techniques for Analysis - Correlation Analysis; Parametric Test: t test - F test - z test; Non Parametric Test: Chi square test - ANOVA; Interpretation of Data - Significance - Precautions in Data Interpretation(Theory & Problems)

UNIT-IV: Research Reporting and Modern Practices in Research: Research Report Writing - Importance – Essentials - Structure / Layout – Report Writing Types; References and Citation Methods: APA (American Psychological Association) - CMS (Chicago Manual Style) - MLA (Modern Language Association) - Footnotes and Bibliography - Modern Practices: Ethical Norms in Research - Plagiarism - Role of Computers in Research (Theory).

Suggested Books

1. Krishna Swamy, O.R., Methodology of Research in Social Sciences, HPH, New Delhi.
2. Kothari, C. R., Research Methodology, New Age International Publications.
3. Shenoy, G.V., Quantitative Techniques for Managerial Decisions, New Age Publications
4. Gupta, S.C., Fundamentals of Statistics, Himalaya Publishing House, New Delhi
5. Anand Sharma, Quantitative Techniques for Decision Making, Himalaya Publishing House, New Delhi
6. Panner Selvam, R., Research Methodology, Prentice Hall of India, New Delhi.
7. Sachdeva, J.K., Business Research Methodology, Himalaya Publishing House, New Delhi.
8. Wilkinson, T.S. & Other, Methodology and Techniques of Social Research, Himalaya Publishing House, New Delhi.
9. Young Pauline, V, Scientific Social Surveys and Research - 4th Ed., Prentice Hall of India, New Delhi.



302: CORPORATE TAX AND GST

Objective: The objective of this paper is to describe the theoretical and practical knowledge of taxation to the students.

UNIT- I: Introduction: Meaning - Definition – Brief History of Tax – Types of Taxes – Basic Concepts – Objectives – Principles – Legal Framework – Advantages and Disadvantages of Taxation – Tax Planning – Tax Avoidance – Tax Evasion – Tax Management – Income – Types of Income – Penalties and Prosecutions – Tax Reforms (Theory only)

UNIT- II: Company Taxation: Introduction – Definition- Features – Types of Companies – Residential Status of a Company – Incidence of Tax – Income Sources – Agricultural and Non-agricultural – Income Computation of Gross Total Income of a Company – Tax Deductions U/S 80 – Carry Forward and Set Off - Accumulated Tax (Theory & Problems)

UNIT- III: Goods and Service Tax (GST): Concept – Types of GST – Features of GST - Advantages and Disadvantages – Comprehensive structure of GST Model in India – Registration under GST – GST Migration - GST Slabs in India – Transactions Covered under GST – Items Exempted from GST - Changes in GST since Beginning. (Theory only)

UNIT- IV: GST Execution: Input Tax Credit – Distribution of Tax – Tax Invoice in GST – GST Composition Scheme – GST Returns - Reverse Charge Mechanism in GST - GST on Exports and Imports – Taxes on Outside the Purview of GST. (Theory only)

Suggested Books

1. Monica Singhanian Vinod K Singhanian, Students Guide to Income Tax, 57th Edition (2017-18), July 2017,
2. Vinod K. Singhanian, Indirect Tax Laws, Taxmann Publications.
3. Gaur, V.P. Narang, D.B. Gaur, Puja Puri, Rajeev, Income tax Law and Practice, Kalyani Publishers
4. R.G. Saha, Taxation, Himalaya Publishing House Pvt. Ltd.
5. Joy Dhingra, Goods and Services Tax Fundamentals, 2017, Kalyani Publishers.
6. Dr. Thomas Joseph Thoomkuzhy, Dr. Jaya Jacob M., Ms. Chinnu Mariam Chacko, GST The Essentials of Goods and Services Tax: 2017, Himalaya Publishing House.
7. V S Datey, GST Ready Reckoner: Enforced with Effect from 1-7-2017, July 2017 4th edition, Taxmann publication
8. The Central Goods and Services Tax Act, 2017, NO. 12 OF 2017 Published by Authority, Ministry of Law and Justice, New Delhi, the 12th April, 2017.



205: E-COMMERCE

Objective: The objective of this paper is to help the students to know about the contents of e-commerce and its practices in business.

UNIT-I: Introduction to E-Commerce: Concept – Features - Advantages and Disadvantages of E-Commerce - Global e-Commerce Environment - Adopting e-Commerce - **Evolution of e-Commerce** - Future of e-Commerce – Issues in e-Commerce: Privacy Issues –Social Issues - Security Issues.

UNIT-II Web Design: World Wide Web - **Web designing** - Web as market place - Role of Website in B2C e-Commerce - Push and Pull Approaches - Alternative Methods of Customer Communication such as e-mail – BBA - E-mail Etiquette and e-mail Security.

Hands on Practice: Web Page Designing – E mail Creation – E mail Security.

UNIT-III: Business Models of E-Commerce: B2B - B2C - B2G and Other Models of e-Commerce - Applications of e-Commerce to Supply Chain Management - Digital Market: Concept - **Traditional Market Vs Digital Markets** - Product and Service Digitization – Digital Marketing – Digital Advertising – Digital Branding – Retailing – Trading of Stocks – **e Auctions** - **Digital Marketing Trends.**

UNIT-IV: E-Payment System: Various types of **e-Payment Systems** – Debit Card System – Credit Card System – Digital Cash - Smart Cards – **Digital Cheque** - **Digital Wallets**; Threats: Types of Threats - Sources of Threats - Protecting e-Commerce Assets and Intellectual Property – Firewalls – Client Server Network Security - Security Tools - Digital Identity - Digital Signature.

Hands on Practice: Creating Digital Signature – Usage of Digital Cash – Payment through Credit / Debit Card – Usage of Digital Wallet.

Suggested Books

1. Efraim Turban, Jae Lee, David King and H.Michael Chung, Electronic Commerce – A managerial perspective, Pearson Education, New Delhi.
2. Kenneth C.Laudon, and Carol Guercio Traver, E-Commerce – Business, technology and society, Pearson Education, New Delhi.
3. Joseph, E-Commerce, PHI, New Delhi.
4. Ravi kalakota, Whinston, Frontiers of Electronic Commerce, Pearson Education, New Delhi.
5. Daniel Minoli, Emma Minoli, Web Commerce Technology Handbook, Tata MC Graw Hill, New Delhi.
6. Ward Hanson, Internet Marketing, Thomson Learning Inc, Bangalore.

M.A. ECONOMICS - FIRST SEMESTER
103 INTRODUCTORY MACRO ECONOMICS

Module – I: National Income Accounting

Circular Flow Of Income - Definition of National Income – Concepts of National Income – **Methods of Estimation** – Problems of Estimation of National Income – National Income Statistics of India

Module – II: Consumption Behaviour and Investment

Consumption Function – Keynes Psychological Law of Consumption-implications of the law- **Theories of aggregate consumption**- Absolute Income Hypothesis, Relative Income Hypothesis, Life Cycle Hypothesis, Permanent Income Hypothesis – Theory of Investment - Determinants of Investment – Marginal Efficiency of Capital - Accelerator.

Module – III: Business Cycles and Unemployment

Business Cycles – Phases of Business Cycles – Theories of Business Cycles – Schumpeter, Samulson, J.R. Hicks, Keynes – Meaning of Unemployment – **Types of Unemployment** – Theories of Unemployment

Module – IV: Keynesian Macroeconomic Theory

New Classical Economics - Significance of the Keynesian Theory – supply side Economics – Relevance of Keynesian Economics to Underdeveloped Economies – **Criticism Of Keynesian Theory.**

Reading List:

1. Aukly, G. (1978), *Macroeconomics: Theory and Policy*, Macmillan, New York.
2. Ahuja H L, “*Advanced Economic Theory – Microeconomic Analysis*”, Sultan Chand and Co. Ltd., New Delhi, 2000
3. Gordon, R.A, and L.R. Klein(Eds.)(1965), *Readings in Business cycles*, Irwin, Homewood.
4. Hall, R.e. and J.B. Taylor (1986), *Macroeconomics*, W.W. Norton, New York.
5. Hicks, J.R. (1974), *The crisis in Keynesian Economics*, Oxford University Press, New Delhi.
6. Rakshit, M. (1998), *Studies in the Macroeconomics of Developing Countries*, Oxford University press, New Delhi.
7. Rao, V.K.R.V. (1983), *India’s National Income: 1950 to 1980*, Sage Publications, New Delhi.
8. Shapiro, E. (1996), *Macroeconomic Analysis*, Galgotia Publications, New Delhi.
9. Samuelson and Nordhaus, “*Economics*”, Tata McGraw-Hill Pub., Co., Ltd., New Delhi, 2002.

M.A. ECONOMICS - FIRST SEMESTER
104 PUBLIC ECONOMICS

Module I: Nature, Scope and Principles of Public Finance:

Meaning, **Importance and Scope of Public Finance** – Objectives of Public Finance – Functions of Modern State – Classical, Keynes and Musgrave views on the Theory of the Public Finance – Principle of Maximum Social Advantage -.

Module II: Public Revenue and Taxation:

Sources of Public Revenue: Taxes – **Direct and Indirect Taxes** – Merits and Demerits of Direct and Indirect Taxes — Canons of Taxation - Characteristics of a Good Tax -Single and Multiple Taxation — Ability to Pay Theory – Incidence and Effects of Taxation – Trends in Indian Taxation during last Four Decades.

Module III: Public Expenditure and Public Debt:

Role of Public Expenditure in Developing Economies – Causes for the Growth of Public Expenditure – Principles of Public Expenditure - Wagner’s Law of Increasing State Activities - Peacock and Wiseman Hypothesis - Effects of Public Expenditure – Public Expenditure Management – Public Debt: Internal and External Debt – Causes of Public Debt - –Role of Public Debt in Developing Countries – Effects of Public Debt - Public Debt Management – Public Debt in India.

Module IV: Federal Finance and Budgets:

Centre-State Financial Relations in India – Finance Commission – Functions of Finance Commission -Recommendations of 14th Finance Commission – Budget – Types of Budgets – Analysis of the Union Budget (Latest) – Trends in Revenue and Expenditures of the Government of India – Analysis of A.P. State Budget (Latest) – Trends in Revenue and Expenditures in Government of Andhra Pradesh – Deficit Budget – **Types of Deficit Budget** – Causes and Problems of Deficit Budget – FRBM Act -2005.

References:

1. Musgrave, Richard A. and Musgrave Peggy B, *Public Finance in Theory and Practice*, Mc Graw-Hill, 5th Edu. 1989.
2. Stiglitz, Joseph E, *Economics of the public Sector*, (2nd Edition), W.W. Norton & Co., New York, 1988.
3. Harvey, Rosen, *Public Finance* (Second Edition), IRWIN, Homewood, 1988.
4. Atkinson, A. B and Stiglitz, J.E., *Lectures on Public Economics*, McGraw-Hill, New York, 1980.
5. Myles, Gareth D, *Public Economics*, Cambridge University Press, 1995.
6. Boadway Robin W Wildasin David E, *Public Sector Economics*, (2nd Edition), Little Brown, Boston, 1984.
7. Musgrave, Richard A & Shoup. Carl S (Ed.) *Classics in the theory of Public Finance*, Macmillan, 1962.
8. Musgrave Richard A, *Fiscal Systems*, Yale University Press, New Haven and London,
9. Tyagi, B.P. *Public Finance*, Jai Prakash Nath Publications, Meerut, U.P.
10. Ahuja, H.L., *Modern Economics*, S.Chand&Company Ltd, New Delhi.
11. Dewtt, K.K, *Modern Economic Theory*, S.Chand & Company Ltd, New Delhi.
12. Sundaram, K.P.M and Andley, K.K, *Public Finance* (Theory and Practice), S.Chand&Company Ltd, New Delhi.

M.A. ECONOMICS - FIRST SEMESTER

105 MATHEMATICAL METHODS IN ECONOMICS

Module I: Elementary Algebra:

Simple fractions and factors – solution of linear and quadratic equations –Solution of Simultaneous equations –Concept of a Function - Types of Functions; Exponential, logarithmic, Polynomial and Homogenous Functions –Geometrical presentation of a Function –Demand and Supply Functions –**Determination of Equilibrium Price and Quantity.**

Module II: Introduction to Economics:

Slopes and limits –Concept of a Derivative –Rules of Differentiation – Second order Derivatives –Maxima, Minima and point of inflexion of a function (One Independent Variable) –Partial and total differentiation. Concept of Integration –Rules of Integration Area Between the Two curves.

Module III: Economics Application:

Marginal and average concept of costs – Revenue and Profit functions –Maximum and Minimum concept of a firm under perfect competition – Elasticity of Demand and Supply functions **Types of elasticity of Demand relationship Between TR, MR, AR and ed** – **Euler's theorem** –Consumer's Surplus and Producer's Surplus.

Module IV: Matrices and Determinants:

Concept of a Matrix –Types of Matrices –Simple Operations on Matrices. Determinants and their Basic Properties. **Rank of a Matrix** – minors and co-factors –Inverse of a matrix – Solution of Simultaneous Equations –Cramer's rule.

References:

1. Allen, R.G.D.(1957), '*Mathematical Economics*', St.Martin's London.
2. Allen, R.G.D.(1972), '*Mathematical Analysis for Economist*', Macmillan press and ELBS, London.
3. D.Bose, '*An Introduction to mathematical Economics*', (Himalaya Publishing House), HYD.
4. Caroline Dinwiddie, '*Elementary Mathematics for Economists*', Oxford University Press, Nairobi, Kenya, 1993.
5. Taro Yamane: '*Mathematics for Economist*' (An elementary survey), 2nd Edition Prentice Hall Of India, New Delhi -1.
6. B.C. Mehatha and G.K. Madhani: '*Mathematics for Economist*', Sultan Chand&Sons, New Delhi.
7. D.R Agarwal: '*Quantitative Method*, (Mathematics and Statistics), Vrinda Publications Pvt. Ltd, Delhi -1.
8. Chaing, A.C(1986),: '*Fundamental methods of Mathematical Economics*', Mc.Graw Hill, New York.

M.A. ECONOMICS - SECOND SEMESTER
201 INTERNATIONAL ECONOMICS

Module -I: Theories of Trade:

Classical theory – Adam Smith, Ricardo, Heberler, J.S. Mill – Modern Theory- Heckscher-Ohilin, Stopler-Samulson, **Factor Price Equalization theorem**, Rybczynski

Module -II: Trade Policy and Theory of Trade Interventions:

Gains from trade and their distribution; Concepts of terms trade their uses and limitations; Hypothesis of secular deterioration of terms of trade: **Trade an engine of Economic growth.** The theory of interventions -Tariff – Quotas and non-tariff barriers, Economic effects of Tariffs Vs Quotas

Module -III: Balance of Payments and The Foreign Exchange:

Structure of Balance Of Payments – Disequilibrium in BOP, measures to correct it- Traditional, Absorption and Monetary Approaches for adjustment in the Balance of Payments - Foreign Trade Multiplier – Basis of forex market/fundamentals- Determination Of Foreign Exchange, **Theories of Foreign Exchange Rate.**

Module -IV: Global Institutions:

The Bretton Woods System – IMF and World Bank- Collapse of BrettonWood System - WTO – Issues at the recent WTO Ministerial Conferences –International Development Association (IDA) – **International Finance Corporation (IFC)**

Reading List:

1. Bhagwati, J.(ed) (1969): *International Trade: Selected Readings.*
2. Carbaugh (2008): *International Economics.*
3. Chacholiades, M.(1978): *International Trade: Theory and Policy.*
4. Haberler, G.: *The theory of International Trade.*
5. Heller,R. (1964): *Money, Trade and Economic Growth.*
6. Kenen, peter B (1995): *The International Economy.*
7. Kindle Berger, C.P.(1976): *International Economics.*
8. Meier, G.M.(1986): *International Economic Development.*
9. Sodersten, B.(1986) *International Economics,*
10. Sodersten, B and Geoffrey Read, (1994): *International Economics.*
11. J.E.Meade *The Theory of Economic Policy* vol.1 The balance of payments.
12. Prमित Chaudhary *Aspects of Indian Economic Development.*
13. American economic Readings in the theory of International Trade association.
14. Chitale, V.P. *India and the Euro- Currency Markets.*
15. I.M.F. *The Monetary Approach to the BOP.*
16. I.M.F. The role of exchange rates in the adjustment of International payments.

M.A. ECONOMICS - SECOND SEMESTER

204 - INDIAN ECONOMY

Module – I: Structure of the Indian Economy:

Basic Characteristics of the Indian Economy –Components and Construction of Human development Index –**Human Development in India** –Size and Growth Rate of Population in India – Causes of the Rapid Growth of Population and Remedies for population Explosion - Sex and Age Composition of Population –Trends in Birth and Death Rates –Trends in Rural and Urban Population – National Population Policy -2000 - **National Income Estimates in India** – Limitations of National Income Estimation in India - Trends and Structural Changes in National Income in India – Trends in Saving and Investment Pattern in India .

Module – II: Poverty, Employment and Unemployment in India:

Concept of Poverty –**Types of Poverty** –Measurement of Poverty – Trends in Poverty –Causes and problems of poverty – Strategy of Poverty Alleviation –Poverty Alleviation programmes in India– Structure of Employment in India – Labour Force, Sectoral and Occupational Structure – Unemployment in India – Types of Unemployment in India - Measurement of Unemployment – Causes and Problems of Unemployment in India - Government policy for removing Unemployment – **Major Employment Programmes in India with special reference to MGNREGP.**

Module – III: Indian Planning and Nithi Aayogh:

Overview of the Objectives and Development Strategy of Indian Planning from First to Twelfth Five Year Plan – Achievements and Failures of Planning in India – **Nithi Aayogh** - Role, Performance and Problems of Public Sector in India –Role and Problems of Private Sector in India - Economic Reforms in India.

Module – IV: Indian Monetary and Fiscal Policies

Objectives of Monetary Policy in India - Monetary Policy of Reserve Bank of India- Credit Control Policy of RBI - **Monetary Policy in the Post Reform Period**- Objectives of Fiscal Policy in India – Fiscal Imbalance and Deficit Finance - Fiscal Responsibility in India- Fiscal Responsibility and Budget Management (FRBM) Act - Fiscal Reforms in India.

References:

1. Datt, Ruddra and K.M.M. Sundaram (Current Edition) Indian Economy S.Chand & Co., New Delhi.
2. Misra and Puri(Current Edn.) *Indian Economy*, Himalaya Publishing House, New Delhi.
3. Ahluwalia I.J. and IMD Litte (Ed) (1999) *India's Economic Reforms and Development*, Oxford University Press, New Delhi.
4. Bardhan, P.K. (1999), *The Political Economy of Development in India*, Oxford University Press, New Delhi.
5. Bramhananda, P.R. and V.R.Panchamucki (Eds) (1987) *The Development Process of Indian Economy* – Himalaya Publishing House, New Delhi.
6. Government of India, Economic Survey (Various Years).
7. Government of India ,Planning Commission Reports (Various Plans)

M.A. ECONOMICS - SECOND SEMESTER
205 STATISTICAL METHODS IN ECONOMICS

Module I Central tendency: Measures of Central tendency- Dispersion – Skewness- Kurtosis

Module II: Correlation and Regression:

Definition –Types of Correlation –Methods of Correlation; Scatter diagram, Graphic Method, Karl Pearson's method, Spearman's Rank Correlation- Regression analysis – Method of the Least Squares – Regression Equations –Regression Lines – Standard Error of estimate –Properties of Regression coefficients.

Module III: Probability and Sampling Theory:

Definitions of Probability – Approaches of Probability –Addition and multiplication Theorems of Probability – Conditional Probability. Basic concepts of Sampling - Probability and Non –Probability sampling Methods – Sampling and Non-Sampling Errors – Remedial measures –Merits and limitations of Sampling –Need for Sampling – Census V/s Sample.

Module IV: Tests of Hypothesis:

Tests of Hypothesis- Formulation of Statistical Hypothesis –Null and Alternative Hypothesis- Normal curve – level of significance – Critical region – Confidence Intervals - One-tail and Two-tail tests –Type-I and Type-II errors -Large and small Sample Tests (t- test) - Testing of differences between means, standard deviations, proportions and Correlation Coefficient - X^2 test.

Reference:

1. Gupta, D.B: *Fundamentals of Statistics*, Himalaya Publications, HYD.
2. Gupta, S.P: *Introduction to Statistical Methods*, Sultan Chand and Sons, New Delhi.
3. Gupta, S.B: *Fundamentals of Statistics*, Himalaya Publications, HYD.
4. John E.Freund: *Mathematical Statistics*, Prentice-Hall of India Pvt.Ltd.New Delhi.
5. Medhi, J: *Statistical Methods – An Introductory Text*, New Age International (P) Ltd. New Delhi.
6. Gupta, S.C: *Fundamentals of Statistics*, Himalaya Publications, Hyderabad.
7. Gupta, S.C, & Kapoor, V.K: *Fundamentals of Mathematical, Statistics*. Sultan Chand and Sons, Publications 23, Daryaganj, New Delhi.
8. Hary Frank&Steven,C, Althoen; '*Statistics- Concepts and Applications*, Camebridge University Press, Cambridge.

M.A. ECONOMICS - THIRD SEMESTER

301 ECONOMETRIC METHODS

UNIT – I: FUNDAMENTALS OF ECONOMETRICS:

Nature, and scope of Econometrics – Definitions – Objectives – Uses and Limitations. Variables: Dependent, Independent, exogenous, endogenous, Predetermined, Discretionary and Non-discretionary exogenous variables. Relation between Econometrics, **Mathematical Economics and Statistics**. Types of data: Time Series data – Cross section data – Pooled data with suitable examples.

UNIT – II: GENERAL LINEAR MODEL:

Single equation linear model-Assumptions and properties of OLS- Multiple regression model – **Estimation and Interpretation of Autocorrelation**: Causes of Autocorrelation –Coefficient of Autocorrelation – The first order Autoregressive scheme – Effects of Autocorrelation – Detection of Autocorrelation –Remedial Measure. Multicollinearity: Reasons – Consequences – Detection of Multicollinearity – Remedial measures. Heteroscedasticity- Reasons – Consequences – Tests – Remedial measures..

UNIT – III PROBLEMS IN REGRESSION MODEL :

Dummy variables: Uses – Features – Dummy dependent variables. Lags: Uses of lags in Economics – Reasons – **Autoregressive model** – Distributed lags models. Almon's approach–Koyck approach – Adaptive Expectation model – Partial Adjustment model.

UNIT – IVSIMULTANEOUS EQUATION MODEL:

Simultaneous Equations: Definition – Bias – Consequences. Identification: Rules of Identification – Reduced form. Estimation Methods: **Indirect Least Squares (ILS)** – **Two Stage Least Squares (2SLS)**

References:

1. Gujarati. D.N. (2007) Basic Econometrics, (4th Edn.) Mc Graw Hill, New Delhi .
2. Intrilligator, M.D. (1978) Economics Methods, Techniques and Applications Prentice Hall, New York.
3. Johnston, J. (1991) Econometrics, Mc Graw Hill, London.
4. Koutsoyiannis A (2001) Theory of Econometrics Palgrave, New York.
5. Krishna K.L (1997) Econometric Applications in India, Oxford University Press, New Delhi.
6. Theili H, (1981) Introduction to Econometrics, Prentice Hall, New Delhi.
7. Madanani, G.M.K. (1994), Introduction to Economics, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.
8. Mehatha B.C & Kranti Kapoor (2010) Fundamentals of Econometrics, Himalaya Publishing House, Mumbai.
9. Shyamala, Navadeep Kuar and Arul Pragasam. T (2010) A text book of Econometrics, Vishal Publishing Co; Jalandhar.
10. Pindyck, S.Robert, Rubinfeld L.Daniel :(1984) Econometric models and Economic Forecasts, Mc Graw Hill, New Delhi.

M.A. ECONOMICS – THIRD SEMESTER

302 FINANCIAL MARKETS AND INSTITUTIONS

I. FINANCIAL SYSTEM:

Evolutions of financial system – Structure of Financial System – Functions of Financial System – Financial System and Economic development.

II. MONEY MARKET:

Features of Money Market – Instruments of Money Market: Call Money Market **Treasury Bills Market** – Commercial Bills Market – Market for Commercial papers – Certificate of Deposits – Money market intermediaries: Discount and Finance House of India (DFHI) – Securities Trading Corporation of India (STCI) Deficiencies and Recent developments in Indian Money Market.

III. CAPITAL MARKET:

Industrial Securities Market: Primary and Secondary Markets- Government Securities Market and Long Term Loans Market – Objectives, Functions and Regulation of Securities and Exchange Board of India (SEBI) – Stock Exchange **Over the Counter Exchange of India (OTCEI)** – Functions and Bombay Stock Exchange (BSE) – National Stock Exchange (NSE) – Reforms in Capital Market.

IV. FINANCIAL INSTITUTIONS:

Functions and performance of Industrial Finance Corporation of India (IFCI) Industrial Development Bank of India (IDBI) – Industrial Credit and Investment Corporation of India (ICICI) – Small Industrial Development Bank of India (SIDBI) – State Financial Corporation (SFCs) – Functions and **Performance of Life Insurance Corporation (LIC)** – General Insurance Corporation (GIC) and Unit Trust of India (UTI). Mutual Funds

REFERENCES:

1. Dougall, Herbert, Capital markets and institutions, Prentice Hall of India, New Delhi.
2. Hazel.J.Johnson, Financial Institutions and Markets, MC Graw Hill, London.
3. Hendrik.S.Houthakker, The Economics of Financial Markets, Oxford University Press, New Delhi.
4. H.R.Machiraju. International Financial Markets and India, Wheeler Publishing Company, New Delhi.
5. L.M.Bhole, Financial Institutions and Markets, Tata Mc Graw Hill, New Delhi
6. M.Y.Khan, Indian Financial Systems, Tata Mc Graw Hill, New Delhi.
7. M.Y.Khan and P.K.Jain, Financial Management, Tata Mc Graw Hill, New
8. O.P.Chalwla, Money and Securities Market, NIBH, Pune.
9. Peter.S.Rose, Money and Capital Markets: Financial Institutions and Instruments, Tata Mc Graw Hill, London
10. R.B.I.Bulletins, Mumbai.
11. S.C.Kucchal, Corporation Finance, Chaitanya Publishing, Allahabad.
12. S.L.N.Sinha, Capital Markets in India, Vora & Co, Bombay.
13. Vasant Desai, Indian Financial Systems, Himalaya Publishing House, Bombay.
14. V. A. Avadhani, Indian Capital Market, Himalaya Publishing House, Bombay.
15. A. Avadhani, Investment Management, Himalaya Publishing House, Mumbai.
16. V.K.Bhalla, Investment Management, S, Chand and Company, New Delhi.

M.A. ECONOMICS - THIRD SEMESTER

303 INDUSTRIAL ECONOMICS

Module I: INDUSTRIAL DEVELOPMENT IN INDIA.

Role of Industrialization - Factors Promoting Industrialisation- Trends in Industrial Production in India - Industrial Development in India during the Planning period - Industrial Pattern and changes during the Plans- Problems of Industrial Development in India - Causes and Consequences of Industrial Sickness in India - **Remedial Measures to Prevent Sickness – Special Economic Zones (SEZs) in India.**

Module II: INDUSTRIAL LOCATION

Location, Localization and Planned Location – **Weber’s Theory of Location** – Primary Causes (Regional Factors)- Secondary Causes (Agglomerative and Deglomerative Factors) Sargant Florence’s Theory of Location - Factors Influencing Location - Balanced Regional Development of Industries - **Need for Balanced Regional Development of industries in India.**

Module III: LARGE SCALE INDUSTRIES AND MICRO, SMALL, MEDIUM ENTERPRISES IN INDIA

Role of Large Scale Industries in India – Problems of Large Scale Industries in India and its Remedial Measures - Major Large Scale Industries in India- **Textile Industry** - Sugar Industry - Cement Industry - Iron & Steel Industry - Paper Industry- Role and Performance of Micro Small Medium Enterprises (MSME) in India - **Problems of MSME in India and its Remedial Measures.**

Module IV: INDUSTRIAL FINANCE AND POLICIES

Sources of Industrial Finance – Types of Industrial Finance – **Industrial Finance Corporation of India (IFCI)** – State Financial Corporations (SFCs) – National Industrial Development Corporation (NIDC) – Industrial Development Bank of India (IDBI)– Small Industries Development Bank of India (SIDBI)- Industrial Policies 1948, 1956, 1977, 1980 – New Industrial Policy 1991 - **Disinvestment Policy in Public Sector Enterprises.**

Reference:

1. Ahulwalia, I.J.: Industrial Growth in India, Oxford University Press, New Delhi. 1985.
2. Barthwal, R.R.: Industrial Economics, Wiley Eastern Ltd., New Delhi.
3. Cherunilam, F.: Industrial Economics : Indian Perspective [3rd Edition] , Himalaya Publishing House, Mumbai,1999.
4. Desai, B.: Industrial Economy in India [3rd Edition], Himalaya Publishing House, Mumbai,1999.
5. Gangadhara Rao, M.Heggade Ogayar, D., Yadapadithya: Industrial Economy : Trends Problems and Prospects,Part II, Kanishka Publishing House, New Delhi.
6. Datt, Ruddra and K.M.M. Sundaram (Current Edition) Indian Economy S.Chand & Co.,
7. Misra and Puri(Current Edn.) *Indian Economy*, Himalaya Publishing House, New Delhi.
8. Sivayya, K.V. and Das,V.B.M: Indian Industrial Economy, S.Chand&Co. Ltd. New Delhi.
9. Sharma,A.K.: Industrial Economics, Anmol Publications Pvt. Lmt. New Delhi.

M.A. ECONOMICS- THIRD SEMESTER

304 HEALTH ECONOMICS

MODULE: 1 Introductory Health Economics

Health Economics- Nature and scope of health economics, fields of health economics- Determinants of Health Status- Role of Health in Economic Development – **Characteristics of health services-health care problems.**

MODULE: 2 The National and International Health Scenario and Resource allocation:

Organization of health care delivery in India- General Issues concerning health care delivery in India- Health indicators such as infant mortality, life expectancy at birth, death rate, cause specific morbidity and mortality rates etc- Sources of health statistics usefulness and limitations- Resource allocation problems in private and government hospitals- Resource allocation problems facing a private practitioner- **The problem of multiple services of a hospital**- Pricing of these services and the choice of the mix of services-The demand for health services and the role of the Physician.

MODULE: 3 Financing of Health Services:

A review of per capita private and public expenditure on health services- - An analysis of the sources of (public) finance for health- **The need for a general health insurance**- the need for a special health insurance for the poor, disabled, and the aged Financing and Delivery of healthcare services in India-Health care financing reforms in India.

MODULE: 4 Nutrition and Health: Indian Experience

Nutrition and Health-Nutritional Status in India-Determinants of Nutritional Status-consequences of nutritional deficiencies-changes in morbidity pattern and trends immortality rates-Development Policies, health strategy and role of non-health system-Health Care Delivery of Mother and Child- **Health for All and Health Policy in India**

READING LIST

1. Dasgupta, P.S. and G.M. Heal (1958), Economic theory and exhaustible resources, Cambridge University Press, Cambridge.
2. Chopra, K. and S.C. Gulati (2000), Migration and Management of Common property resources: A Study in Western India, Sage, New Delhi.
3. Padmanabhan, C.B. (1984), Financial Management in Education Select books, New Delhi.
4. Woodhall, M. (1992), Cost- Benefits Analysis in Educational Planning, UNESCO, Paris.
5. Panchamukhi, P.R. (1980), Economics of Health: a Trend Report in ICSSR A Survey of Research in Economics, Vol.VI, Infrastructure, Allied, New Delhi.
6. Berman P. and M.E. Khan (1993), Paying for India's Health care, Sage Publications, New Delhi.
7. Baru, R.V. (1998), Private Health-care in India: Social Characteristics and Trends, Sage Publications, New Delhi.
8. Government of India, National Health Policy, New Delhi.
9. World Bank (1993), The World Development Report, 1993: Investing in Health, Oxford University Press, New York.
10. Krishna Kumar, T. and K.K.Rao (1987) Financing of Health Services in India.

M.A. ECONOMICS - FOURTH SEMESTER

401 AGRICULTURAL ECONOMICS

Module I: Agriculture and Economic Development

Nature and Scope of Agricultural Economics – interdependence between Agriculture and Industry – Traditional and Modern Agriculture – **Role of Agriculture in Economic Development** –Agricultural development, Poverty and environment

Module II: Agricultural Production & Productivity

Economics of Agricultural Production – **Resource use efficiency**; factor combination and resource substitution inter regional variation in growth of output and productivity; cropping pattern shifts; farm planning, budgeting, and programming; Resource use efficiency in traditional agriculture; Technical change, labor absorption and gender issues in agricultural services.

Module III: Agricultural Marketing and Prices:

Marketing and State Policy; Agricultural markets and marketing efficiency- Regulated markets; marketed and marketable surplus; Behaviour of agricultural Prices- State policy with respect to agricultural marketing; warehousing; prices; **Taxation and Crop Insurance**; Terms of Trade between agricultural and non agricultural prices; Need for State intervention; Objectives of agricultural price policy- instruments and evaluation.

Module IV: Agriculture and Globalization:

Food Security and Poverty reduction- **International trade in agricultural commodities**- Role of World Trade Organization,; Issues in Liberalization of domestic and International trade in agriculture – Impact of WTO on Indian agriculture.

Reading List:

1. R. N. Soni (2010): *Leading Issues in Agricultural Economics*, Vishal Publishing Co., New Delhi.
2. Ruddar Datt & KPM Sundaram (2010): *India Economy*, Deep & Deep Publications, New Delhi.
3. Bhaduri, A (1984): *The Economic Structure of Backward Agriculture*, Macmillan, New Delhi.
4. Bhalla, G.S (1994): *Economic Liberalization and Indian Agriculture*, Institute for Studies in Industrial Development, New Delhi.
5. Bilgrami, S.A.R. (1996): *Agricultural Economics*, Himalaya Publishing House, New Delhi.
6. Dantwala, M.L. etal (1991): *Indian Agricultural Development Independence*, Oxford & IBH, New Delhi.
7. Government of India (1976): *Report of the National Commission on Agriculture*, New Delhi.
8. Gulati, A and T. Kelly (1999): *Trade liberalization and Indian Agriculture*, Oxford University Press, New Delhi.

M.A. ECONOMICSS- FOURTH SEMESTER

402 ENVIRONMENTAL ECONOMICS

UNIT 1: Environmental Economics – An Introduction

Definition scope and importance – need for public awareness **National Resources** Renewable and non renewable resources- National Resources and associated problems Forest resources water, mineral Food Energy – Land Resources.

UNIT 2: Conservation of Resources

Equitable use of resources for sustainable Development

Conservation and preservation – Man's impact on resources – Adverse effects on resources – Conservation awareness – Methods of conservation – Material substitution – Product life extension – **Recycling – Optimum recycling – Waste reduction.**

UNIT 3: ENVIRONMENTAL POLLUTION

Definition – causes, Effects and Control measures of air, water, soil noise , Marine, Thermal, Nuclear hazards- Disaster Management floods, Earth,quakes, cyclones and land slides- Types of pollution and economic effects of pollution: Air Pollution, water pollution, Soil Pollution, Noise pollution. Solid Waste Management: Types of Solid waste, Factors affecting the solid waste generation, Impact of solid wastes, **Recycling and reuse population and urbanization;** Its Impact on Environment and Health: .

UNIT 4: GLOBAL ENVIRONMENTAL ISSUES

Global Environmental Issues like Climate Change, Acid Rain, Global warming, ozone layer detection Watershed management, watershed approach for sustainable development. Role of Information Technology in Environment and Human Health.

References

1. Resources and Environmental economics:. Author: A.C.Fisher ,Cambridge university press
2. Sustainable Development and Environment : Author: A.K. De, N.C. Gupta
Publication: Cosmo Publications
3. Text Book of Environmental Science &Technology :Dr. M. Anji Reddy : B.S. Publication
4. Environmental Studies: : Manoj Tiwari :Publication: J.K. International publishing house Pvt. Ltd.
5. Environmental Education for Conservation and Development: Berberet.G and DeshBhandu ,
Dehradun Natraja Publishers.
- 6.A Text book of Environmental Science: Dr. B. R. Ambedkar Open University, Hyderabad.

M.A. ECONOMICS- FOURTH SEMESTER

404 ELECTIVE-II ANDHRA PRADESH ECONOMY

Module I: LAND REFORMS IN A.P.

Land reforms Act in AP – Abolition of Intermediaries, Tenancy reforms, Land Ceiling Acts, Escheats Act, A.P. Assigned Land Act, A.P. Urban Land Act, Land grabbing control Act, **Computerization of land records** – Problems and Recommendations of Koneru Rangarao Committee.

Module II: REGIONAL DISPARITIES IN A.P. ECONOMY

Structure of A.P. Economy – Its sectoral and regional distribution of income and Employment . Magnitude of poverty (rural and urban) and Illiteracy – Causes and measures initiated to ameliorate them. **Demographic features in A.P** – Sex ratio, MMR, IMR, Density, Age composition- . Social, Political and Economic Empowerment of Women.

Module III: PLANNING IN A.P.

Five plans of A.P. – Objectives, outlays of public sector plans. Aims, objectives and resources allocation pattern in the recent five year plan. Current Budget policy – Tax structure: Direct and Indirect taxes, allocation for different sectors,. **Public debt of AP**

Module IV: SECTORAL ECONOMY

Agricultural sector- Green revolution, changes in Agri- Technology- Public Distribution System in A.P. – Procurement price, **Administered price and Support price**, Growth and Structure of industries in AP: Weakens and problems. Service sector of AP, with special reference to Transport and Communications, **Tourism and Information technology**

References:

1. R.S.Rao, Fifty years of A.P. 1956 – 2006, CDR and communications, Himayat Nagar, Hydarebad.
2. V.H.Rao, A.P. at fifty, CDR and communications, Himayat Nagar, Hyderabad.
3. C.H. Hanumantha Rao and Mahendra Dev, A.P. development, Economic Reforms and Challenges ahead, CESS, Begumpet, Hyderabad.
4. Y.V.Krishna Rao and S.Subramanyam, Development of A.P. 1956 – 2001 – A Study of Regional disparities, NER Research Central, Vishalandhra Publishers, Hyderabad.
5. Statistical Abstract of A.P.
6. Socio – Economic Survey of A.P., Govt. of A.P.
7. Govt. of A.P., Human development Report, A.P. CESS, Begumpet.
8. J.C.Dhingra, Indian Economy: Environmental policy, Sulthan Chand, New Delhi.
9. Dutt and Sundaram: Indian Economy, Sulthan Chand, New Delhi.
10. Economics Survey, Ministry of Finance, New Delhi.

M.A. ECONOMICS - FOURTH SEMESTER

405 ECONOMICS OF EDUCATION

Module 1: Conceptual Issues in Economics of Education

Meaning, Scope and Importance of Economics of Education – Education and Economic Development – Education and Human Resource Development - **The Concept of Human Capital** – **Education as Consumption and Investment** – Education as Private and Social Investment – Demand for Education – Benefits of Education.

Module 11: Educational Planning and Approaches to Educational Planning

Meaning, Need and Importance of Educational Planning – Different Approaches to Educational Planning – Social Demands Approach – Rate of Return Approach – Manpower Requirements Approach – **Educational Planning in India** – Problems of India's Educational Planning and Suggestions for Improving It.

Module 111: Costs and Financing of Education

Concept of Cost of Education – **Components of Costs of Education** - Types of Educational Costs – Direct (Money) and Indirect (Opportunity) Costs - Public (Social Costs), Private Costs – Recurring and Non-Recurring (Capital) Costs – Unit Cost of Education and Its Importance – Measurement of Unit Cost in Education and Its Problems – Cost Effectiveness in Education – Measurement of Cost Effectiveness – Nature, Scope and Principles of Educational Finance - Sources of Finance for Education – Role of Central, State and Local Bodies in Educational Financing - Public Expenditure on Education in India.

Module IV: Contemporary Economic Issues of Education in India

Equity and Inequality in Education in India and Its Problems and Remedial Measures – Quality and Efficiency of Education – Factors Determining Quality and Efficiency of Education – Causes and Remedial Measures for Poor Quality of Education in India — Wastage of Education – **Types of Wastage of Education** – Causes and Problems of Wastage of Education in India – Remedial Measures for Reducing the Wastage in India – **Globalisation and Its Impact on Indian Education.**

References

- Balsara, M. (1996) New Education policy and Development Challenge, Kanishka Publishers, New Delhi.
- Blaug, M (1972) An Introduction to the Economics of Education, London: Penguin Books, London.
- Blaug, M. (ed) (1968). Economics of Education- Selected Readings. Vol. 1 and 2, Penguin Books, London.
- Cohn, E. and Gesker (1990) T. G. The Economics of Education, Oxford Press.
- Heggade, O. D. (1992) Economics of Education, Himalaya Publishing House, Mumbai.
- Majumdar, T. (1983) Investment in Education and Social Choice, Cambridge University Press, Cambridge.
- Muzammil, M. (1989) Financing of Education, Himalaya Publishing House, New Delhi.
- Naik J.P. (1965) Educational planning in India, Allied Publishers, Bombay.
- Natarajan S. (1990) Introduction to Economics of Education, Sterling Publications, New Delhi.
- Panchamukhi P. R. (ed) (1989) Economics of Educational Finance, Himalaya publishing House, Bombay.
- Tilak J. B. G. (1992) Educational Planning at Grassroots, Ashish publishing House, New Delhi.

31015 - Elective I (Core)

(B) : SHORT STORY

BACKGROUND: Tale - Fable - Story - Novelette. Types of Stories: Detective-Social-Allegorical-Magic - Realism. Aspects of the short story: story - plot - characters - narrative techniques - unities - Tone - Setting - dialogue - telling and showing - structure - style.

UNIT-I:

- (A) Edgar Allan Poe : 1. The Tell Tale Heart
2. The Raven
- (B) O. Henry : 1. The Gift of Magi
2. The Last Leaf

UNIT-II:

- (A) Anton Chekov : 1. On Marriage

- (B) Guy De Maupassant : 1. The Necklace
2. Vendetta

UNIT-III:

- (A) Oscar Wilde : 1. The Selfish Giant
2. The Happy Prince
- (B) Washington Irving : 1. Rip Van Winkle
2. Disiree's Baby

Unit-IV:

- (A) Chinua Achebe : 1. Civil Peace
: 2. The Voter

- (B) Katherine Mansfield : 1. The Dolls House.
: 2. A Cup of Tea.

Unit: V

- (A). Mulk Raj Anand : 1. The Thief
2. The Liar.

- (B): R.K.Narayan : 1. Father's Help
2. The Blind Dog

1. Prof G. Gulam Tariq :

2. Prof. P. Padma :

3. Dr. N. Ankanna :

4. Dr. J. Mercy Vijetha :

5. Dr. RV. Jayanth Kasyap :

Prof. P. PADMA
(BOS Chairperson)
Dept. of English
Yogi Vemana University
Kadapa -516005

41015: ELECTIVE - I

SUBALTERN LITERATURE

UNIT – I

Background Study: Cultural Reflections, Social Realism in the Regional Literatures, Feminist Concerns, **Marginal Literatures.**

UNIT – 2- Poetry:

Yogi Vemana - **A True and Rare Genius** (Select Poems)
Sikhamani - He is the “Filthy” Human Being
Vimala - Kitchen

UNIT – 3- Drama:

Rashid Jahan - **Aurat (Woman)**
Neena Mehta - Brides are not for Burning

UNIT – 4 – Fiction:

Shiva Shankar Pilai - **Chemmeen**
Mahaswetha Devi - Water (Short Story)

1. Prof G. Gulam Tariq :
2. Prof. P. Padma :
3. Dr. J. Mercy Vijetha :
4. Dr. N. Ankanna :
5. Dr. RV. Jayanth Kasyap :

Prof. P. PADMA
(BOS Chairperson)
Dept. of English
Yogi Vemana University
Kadapa -516005

Department of Genetics and Genomics
Semester-II

25122: ENERGY METABOLISM

Unit I

Bioenergetics: Thermodynamic principles – Chemical equilibria; free energy, enthalpy (H), entropy (S). Free energy change in biological transformations in living systems; High energy compounds. Phosphoryl group transfer and calculation of phosphorylation potential. oxidation- reduction reactions. Electron transfer reactions in mitochondria. ATP synthesis and regulation of ATP producing pathways. **Regulation of oxidative phosphorylation**. Utilization of oxygen by oxygenases, Superoxide dismutase and catalase.

Unit II

Broad outlines of metabolism. Metabolism of carbohydrates: Glycolysis: Preparative and payoff phases of Glycolysis, Regulation of glycolysis, Fermentation: the anaerobic fate of pyruvate, **Metabolism of hexoses** other than glucose: fructose, galactose and mannose, Citric acid cycle: pyruvate dehydrogenase complex, metabolic sources of acetyl CoA, reactions and regulation of citric acid cycle, Amphibolic nature of citric acid cycle.

Unit III

Uronic acid pathway, metabolism of amino sugars, glycogen metabolism: glycogen synthesis and break down, Regulation of glycogen synthesis and breakdown. Other pathways of carbohydrate metabolism: Gluconeogenesis and maintenance of blood glucose levels, glyoxylate cycle. Pentose phosphate pathway of glucose oxidation, Disorders of carbohydrate metabolism – Glycogen, galactose, Fructose.

Unit IV

Overview of amino acid catabolism, **Biosynthesis and degradation of fatty acids** (Saturated and unsaturated), energy yield and regulation, Biosynthesis of triacyl glycerols, and membrane phospholipids. Biosynthesis and degradation of cholesterol and its regulation. Metabolism of lipoproteins and Ketone bodies.

Recommended Books:

1. LEHNINGER (2017) Principles of Biochemistry, 7th edition, NELSON & COX (Worth) Publ.
2. Principles of Biochemistry, White. A, Handler, P and Smith.
3. David E. Metzler and Carol M. Metzler (2001). Biochemistry-The chemical reactions of living cells- Vol1 & 2. (2nd edition). Harcourt/Academic press, New York.
4. Biochemistry, Lubert Stryer.
5. Review of physiological chemistry, 16th edition, Harold A. Harper.
6. Text of Biochemistry, West and Todd.
7. Outlines of Biochemistry, Conn and Stummf.
8. Metabolic pathways – Greenberg.
9. Biochemistry, 2nd Edition, G. Zubay.

Department of Genetics and Genomics
Semester-II
IInd SEMESTER PRACTICALS

25121-25122: Microbial Genetics & ENERGY METABOLISM

1. Bacterial growth curve
2. Isolation of mutants by gradient plate technique
3. Isolation of mutants by replica plate technique
4. UV survival ,curve
5. Isolation of mutations in bacteria by physical agents
6. Isolation of mutations in bacteria by chemical agents
7. Bacterial conjugation
8. Bacterial transformation
9. Isolation and estimation of glycogen/starch
10. Extraction and assay of extracellular enzymes from fungal source.
11. Factors influencing enzyme activity: pH, substrate concentration and Temperature.

25123-25124: MOLECULAR BIOLOGY & EVOLUTION AND POPULATION GENETICS

1. Setting of molecular biology laboratory creating of ribonuclease free environment in the laboratory.
2. Quantification of DNA and RNA by UV-spectrophotometer.
3. Isolation of total DNA from *E.coli* cells.
4. Isolation of total DNA from Plant leaf tissue
5. Isolation of total RNA from plant leaf tissue
6. Isolation of plasmid DNA from *E.coli* cells.
7. Agarose gel electrophoresis analysis of nucleic acids

Department of Genetics and Genomics
IIIrd SEMESTER
35125: Inherited diseases of Humans
(Non Core paper-2)

UNIT I

Reasons for genetic disorders, syndromes: Chromosome mutations - Chromosome rearrangement-duplication, deletions, inversion and translocation; aneuploidy and polyploidy; Gene mutations- Base substitution, base insertion and base deletion, **transposable elements in humans (SINEs and LINEs)**.

UNIT II

Genetic basis of syndromes and disorders: Introduction, **Monogenic disorders-** Cystic fibrosis, Huntington's disease, Hemophilia, Neurofibromatosis, sickle cell disease and thalassemias; chromosome disorders- cri-du-chat syndrome, Down syndrome; Inborn errors of metabolism- Albinism, Alkaptonuria, cystinuria and pentosuria; DNA repair defects- Xerodermpigmentosum; and multifactorial disorders – diabetes, coronary artery disease and congenital malformation.

UNIT III

Cancer genetics: Definition, types, relationship of the cell cycle to cancer, cancer and programmed cell death, genetic basis for cancer, oncogenes, tumor suppressor genes, role of environmental factors in cancer and genetic pathways to cancer. An overview of epigenetic modifications for cancer

UNIT IV

Diagnosis, **Genetic counseling** and treatment: Prenatal diagnosis- Ultrasonography and fetal echocardiography, Maternal serum screening, Amniocentesis and chorionic villus sampling; Genetic testing for common mutations - protein truncation test, Single stranded conformation polymorphism test and full resequencing of the gene. Genetic counseling- introduction, psychotherapeutic counseling, genetic susceptibility and treatment of genetic diseases.

Reference books:

- 1.Principles of Genetics 2007: Gardner, Simmons, Snustad; Wiley IndiaEdition
2. Human Genetics 2010: Gardner andDavies;
3. Elements of Medical Genetics, Emery's.

Department of Genetics and Genomics
Semester-IV
45121: Structural Genomics

UNIT I

Introduction to Genomics: Definitions, Classification based on system attributes, relationships to other scientific disciplines and types of organisms studied, Historical Perspective of Genomics, Genome sizes, Organization of genome of viruses, prokaryotes, eukaryotes, telomers, tandemly repeated sequences, DNA transposons, retro transposans, organelle DNA. Mapping in prokaryotes by Transformation, Mapping in prokaryotes by Transduction, Mapping in prokaryotes by Conjugation.

UNIT II

Genetic linkage mapping: DNA markers:-RFLP, AFLP, RAPD, SSRs, SNPs, CAPS, SCAR markers; Construction of the genetic linkage maps:- human, plants, Map based cloning- Mutant Mapping, LOD score, MAPMAKER.

Quantitative genetics: Two locus control, Three locus control, Study of polygenic traits, Effect of environment on QTLs, heritability and description of continuous variation of wheat kernel color and human skin color, Cloning QTLs.

Physical mapping: Cytogenetic maps of chromosomal banding, STS, FISH, restriction maps, radiation hybrid mapping (RH), clone contig maps.

UNIT III

Whole genome sequencing: DNA sequencing strategies, clone-by-clone approach, whole genome shotgun sequencing, assembly and finishing genome sequencing, Next generation sequencing and applications, Human genome project.

Sequence databases: Nucleotide sequence databases, protein sequence databases, protein structural databases, literature databases; Genomic databases- UCSC, NCBI Map viewer, ENSEMBL; data files and formats.

UNIT IV

Predictive methods using DNA sequences: Gene prediction methods and programs, promoter characterization and prediction, strategies and considerations.

Sequence comparison: Sequence alignment- pair wise sequence alignment, multiple sequence alignment and their importance.

Phylogenetic analysis: Background terminology and basics, tree construction and importance, common software

Protein structure prediction: How protein structures are determined, Secondary structure prediction; Visualizing proteins; Three-dimensional structure of protein-Homology modeling, threading or Ab initio method, protein structure evaluation and protein structure comparison

Reference books:

Genetics-A molecular approach by peter J.Russel (2006), 2nded.

1. Genomes3 by T.A.Brown(2007)
2. Principles of Gene manipulation & Genomics by S.B.Primrose&R.M.Twyman, 7thed, (2007)
3. Microbial functional genomics by Jizhgahov, Dorothea K.Thompson Ying xu, James M.Tiedje
4. Bioinformatics-Apractical guide to the analysis of Genes and proteins, by Andreas D.Baxevanis, B.F.Francis Ouellette,3rd.Bioinformatics-Tools and applications by David Edwards, Jason strajich and David Hansen(2009)

M.Sc. Geology Choice Based Credit System

25045 – Introduction to Earth Resources

Unit I

Introduction to Earth – Dynamics of Earth, the interior of the Earth – Rocks –Genesis and Types Igneous , Sedimentary and Metamorphic Rocks.

Unit II

Minerals – Definition – Mineralogy and description of Common Rock forming minerals – Industrial minerals – Cement industry, Glass industry, Ceramic industry, Fertilizer industry, Steel Industry.

Unit III

Fuel Minerals – Mineralogy, origin, distribution of Coal – Petroleum and Natural gas – Origin – Inorganic and organic theories – Reservoir rocks – Atomic minerals – Association, occurrence and distribution of Atomic minerals.

Unit IV

Water resources – Hydrological cycle – precipitation, runoff, infiltration and evapotranspiration, Subsurface and vertical distribution of groundwater – Occurrence of groundwater, classification of aquifers, springs and wells.

Reference Books

1. Introduction to Sedimentology – Sengupta, S.M.
2. The petrography of Igneous and Metamorphic rocks in India – S.C.Chatterjee.
3. Metamorphic Petrology- B. Bhaskara Rao
4. Economic Mineral Deposits – Bateman, A.M. and Jenson, M.C.
5. Indian Mineral Resources- Krishna Swamy

M.Sc. Geology Choice Based Credit System

35045 – Essentials of Remote Sensing and GIS Fundamentals

Unit I

Introduction of Remote Sensing – Types of sensors and scanners – Satellite data acquisition systems – Platforms – Airborne and Space borne sensors – Passive and Active sensors – Digital Image Processing – Introduction and Basic concepts.

Unit II

Geographical Information System (GIS) – Introduction – Components of GIS – Data structures in GIS – Raster and Vector data structures – Types of data – Points, lines and Polygons – Data conversion – Raster to Vector and vector to raster.

Unit III

Stages of Mineral Exploration – Methods of choosing target area – Criteria for accepting or rejecting the target area – Guides to ore search – stratigraphic, lithological, geomorphological, structural guides, Rock alteration and Geobotanical guides in mineral exploration.

Unit IV

Remote Sensing Applications in Environment Assessment – Visual interpretation of satellite image for forest cover mapping, Density assessment – Google maps.

Reference Books

1. Remote Sensing Principles and interpretations – Sabins, F.F.Jr.
2. Remote Sensing and Image Interpretation - Lillesand, T., and Kiefer, P.W.
3. Remote Sensing Geology – R.P. Gupta.
4. Indian Mineral Resources- Krishna Swamy

II SEMESTER (Non-Core)
Paper VI – History of India up to 1947

Unit I: Pre-History – Indus Valley Civilization – Vedic Culture – Jainism & Buddhism – Mauryan Empire – Gupta Empire.

Unit II: Delhi Sultanate – Mughal Empire – Maratha Kingdom-Sivaji.

Unit III: Beginning of European Companies – British conquest of India – Company Rule – 1857 Revolt – Socio-Cultural Awakening.

Unit IV: Freedom Struggle – INC – Vande Mataram Movement – Home Rule League – Non-Cooperation Movement – Civil Disobedience Movement – Round Table Conferences and Communal Award – Cripps Mission – Quit India Movement – Indian National Army – Achievement of Freedom – Partition of India.

Suggested Reading

1. A.L. Basham, *The Wonder That Was India*.
2. Romila Thapar, *Early India*.
3. K.A. Nilakanta Sastry, *The History of South India*.
4. Satish Chandra, *Medieval Indian History*.
5. Bipan Chandra, *India's Struggle for Independence*.
6. P.R. Rao, *History of Modern Andhra*.

Paper –IV: HISTORY OF MODERN WORLD from A.D.1453 to 1964 A.D

Unit I- Geographical Discoveries-Renaissance and Reformation-Emergence of Nation States-
French Revolution-Napoleon Bonaparte.

Unit II- Industrial Revolution-Rise of Democratic Movements in Italy and Germany-
Imperialism in Africa and Asia.

Unit III - Russian Revolution-First World War-League of Nations-Revolutions in China and
Japan.

Unit IV- World between two World Wars: Washington Conferences, Das Plan, Young Plan and
Geneva Conferences-Second World War-United Nations Organisations-Cold War.

Suggested Readings

Gordon A.Craig, *Europe Since 1815*, The Dryden Press, Illinois, 1973 (1961).

Chris Harman, *A People's History of the World*, Orient Longman, 2007 (1999).

Jawaharlal Nehru, *Glimpses of World History*, Oxford University Press,1997 (1934-35).

C.D.M.Ketelbey, *A History of Modern Times From 1789*, Oxford University Press, 1992 (1929).

E.H.Carr, *International Relations between Two World Wars, 1919-1939*.

A.J.P.Taylor, *The Struggle for Mastery in Europe, 1848-1918*.

MBT 204: BIostatistics, Research Methodology and Bioinformatics

UNIT – I

(20 hrs)

Measures of Central tendency - mean (arithmetic, harmonic and geometric) median and mode; Correlation, Co-efficient, Simple linear regression; basic idea of Significance Test, hypothesis tests, levels of significance, Student 't', 'Chi' square and goodness of fit.

Analysis of co-variance: introduction, procedure, t-Test for multiple comparisons. Line fitting through graph points, standard curves, MLR. Construction of histograms and interpretation.

UNIT – II

(15 hrs)

Research methodology- Characteristics of research-definition, steps in research process, selection of research problem, literature survey, hypothesis, ability to construct, **presentation and interpretation of research data, preparation of abstract/technical report/manuscript** for publication in scientific journals.

Project writing skills – preparation of research proposal for grants, Background analysis of problem, proposed goal, objectives, targets, implementation of plan and annual budget for project proposal. National and international funding agencies for life sciences research.

UNIT – III

(18 hrs)

Introduction to computers - Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply **Types of operating systems – DOS, UNIX and Windows.**

Basics of presentation software - Creating Presentation; Preparation and Presentation of Slides; Slide Show (Word, Excel and PPT). **Basic of Computer networks;** LAN, MAN, WAN; Concept of Internet and its applications in biology, special software for microbiological approach.

UNIT – IV

(22 hrs)

Bioinformatics: Definition, scope and relevance of bioinformatics, databases, visualization tools, genomics, proteomics, molecular mining, **molecular modeling, Drug designing, gene therapy,** structure and functional relationship of biomolecules.

Sequence analysis: Concepts, importance and alignment methods (pair wise and multiple sequence alignments). Methods of structure prediction for known and unknown folds. Applications of bioinformatics - **Ab initio methods** for determining proteins structure, *In silico* Analysis.

Specialization Paper

PHYS 15304 B: ELECTRONICS-I: Advanced Electronics

UNIT I – 8086 Microprocessors and its Architecture

8086 Microprocessor Architecture, memory paging. **Addressing modes:** Data addressing modes, program-memory addressing modes, and Stack- memory addressing modes.

Instruction Set: Data movement instructions, Arithmetic and Logic instructions, Program control instructions, Assembler details, Data conversions

UNIT II – Advanced Microprocessors

80386 Architecture – Addressing modes – Instruction sets - 80486 Architecture – Addressing modes – Instruction sets - 80586 Architecture – Addressing modes – Instruction sets – Pentium and Pentium pro basics

Unit - III: Assembler and Assembler Programs

Basic idea – PIC 16 series instruction set and ALU – Assemblers and Assembler format – creating simple programs – Adopting a development environment – Building structured programs – Flow control : Branching and Subroutines – Generating time delays and intervals – Logical instruction – Arithmetic instructions.

Unit - IV: 8051 Microcontroller and PIC 16F873A

Introduction of microcontroller 8051, Internal Architecture, Instruction set, addressing modes, PIC 16F87XA Timer 0 and Timer 1 – 16F87XA Timer 2, Comparator and PR2 register – capture/Compare/PWM (CCP) Module – Pulse width modulation – ADC module.

Interface: LED displays – Liquid crystal displays –Sensors –Actuators.

Books for Study

1. The Intel Microprocessors 8086/80-88,80186/80188.80286,80386, Pentium and Pentium pro processor architecture, programming and interfacing by B. B. Brey 4/e, PHI,1999
2. Microprocessors and interfacing, Programming and hardware by Douglas V. Hall, 2/e McGraw Hill International Edition, 1992.
3. The 80x86 IBM PC and Compatible computer (Volumes I &II) by Muhammad Ali Mazidi and Janice Gillespie Mazidi, 2/e, Prentice-Hall Inc.,1998.
4. Soft ware, Hard ware and applications by Walter A. Tribel and Avatar Singh, PHI, 1995.
5. Microcomputer systems: The 8086/8088 Family Architecture Programming and Design by Yu Cheng Lin and Glenn A. Gibson, PHI 1992.
6. Designing Embedded Systems with PIC Microcontrollers: Principles and Applications by Tim Wilmshurst, First Edition, 2007, Newnes – Elsevier – Publishers.

Reference Books:

1. Microcontrollers: Theory and Applications by Ajay V. Deshmukh, , Tata Mc Graw-Hill, New Delhi, 2005.
2. Designing with PIC Microcontrollers by John B. Peatman, Pearson Education,Inc.,1998.
3. The 8051 Microcontroller and Embedded systems, by Mahammad Ali Mazidi and Janice Gillispie Mazidi, Pearson Education Asia, Pvt. Ltd., 2000.

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

Common Course for M.A. Political Science and Public Administration

FIRST SEMESTER SYLLABUS

Revised in 2018-2019

CORE –104: URBAN GOVERNANCE

UNIT - I

- a) Meaning, Nature and Scope of Local Government.
- b) **Issues and Problems of Urbanization and Remedies.**

UNIT - II

- a) Structure and Functions of Urban Local Government.
- b) **Finances of Urban Local Government in India.**

UNIT - III

- a) Structure and Functions of Urban Development Authorities in A.P.
- b) 74th Nagar Palika Constitutional Amendment Act, 1992.

UNIT - IV

- a) Role of Political Parties in Urban Development
- b) Problems of Autonomy and State Control, Urban – Challenges

Selected Readings:

1. S.R. Maheswari, Local Government in India.
2. S.K. Sharma and V.N. Chandra, Municipal Administration in India.
3. 74th Constitution Amendment act 1992.
4. A.P. Municipalities Act 74th constitution Andhra Act (Conformity Legislation 1994)
5. Avasthi (Ed) Municipal Administration in India.
6. T.N. Chaturvedi (Ed) Local Government
7. M.A. Muttalib (Ed) Theory and Practice of Local Government
8. M.A. Hussain, Urban Politics in India.
9. Abhijit Datta (Ed) Theory and Practice of Local Government.
10. United Nations Local Government Personnel System
11. Report of the Rural – Urban Relationship Committee 1966 (Khosla Committee Report)
12. National Commission on Urbanization 198 (Charles Correa Committee Report).

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

Common Course for M.A. Political Science and Public Administration

II SEMESTER SYLLABUS

Revised in 2018-2019

CORE – 204:COMPARATIVE LOCAL GOVERNMENTS

Unit – I

- a) Local Government: Meaning Nature, Scope and Significance
- b) Decentralization and devolution - hurdles for **Decentralization**, Concept Democratic Decentralization

Unit –II English Local Governments

- a) Local Government in England Evolution and recent Trends.
- b) The Mayor of the greater London council, Powers and functions

Unit – III American Local Government

- a) Local Government in USA – Evolution and recent trends.
- b)
- b) Weak Mayor and Strong Mayor – Patterns

Unit – IV Indian Local Government.

- a) Local Government in India – Evolution and recent trends – 73rd and 74th Constitutional Amendments
- b) Issues in **Local governance** – U.K.,U.S.A. India

Selected Readings:

1. Herman Finer, English Local Government.
2. Mard John & Finer S.E., Local government in England & Wales.
3. Peter Richards, The New Local Government System
4. Lord Radcliffe, English Local Government reforms.
5. M.A. Muttalib (ed). Theory and Practice of Local Government.
6. S.R. Nigam, Local Governments in the West.
7. S.R. Maheswari, Local Government in India.
8. Robjan, W.A. Great Cities f the World.
9. Aldufu H.F. American Local Government and Administration.
10. Fisher M.J., & Bi, Hop, American Local Government.

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

Common Course for M.A. Political Science and Public Administration

THIRD SEMESTER SYLLABUS

Non-Core Paper: **Political Thought of Dr. B.R.Ambedkar** Revised in 2018-2019

Objectives: This course aims at training the students to study one political thinker in depth. It also expects students to know the anti-caste thinking on Indian context. The course is also expected to relate the thinking of Dr. B.R. Ambedkar to contemporary problems.

Unit I

1. **Indian Society: Socio, Political Perspectives**
2. Critique of **Indian Nationalism**

Unit II

3. Interpretation and critique of Caste System
4. Interpretation of Buddhism

Unit III

5. **Constitutional Democracy**
6. Reservation Policy

Unit IV

7. Theorizing Dalit Movement
8. The Emergence of Dalits in Political Power

Selected Readings:

1. Gore M.S. 1993, Socuial context of an Ideology: Political and Social Thought of Dr. Ambedkar, New Delhi, Sege
2. Jaffereot Christophe 2004, Dr. Ambedkar and Untouchability, New Delhi, Permanent Black
3. Kasabe Raosaheb, 1985, Ambedkar ani Marx, Pune, Sugava prakashan
4. Omvedt Gail, 2004, Ambedkar: Towards an Enlightend India, New Delhi, Penguin
5. Omvedt Gail, 2003, 'Buddhism in India' , New Delhi, SAGE
6. Omvedt Gail, 1994, 'Dalits and the Democratic Revolution in Colonial India', New Delhi, Sage
7. Rodrigues Valerian, (ed.), 2002, The Essential itings of B.R.Ambedkar, New Delhi, OUP
8. P.Kesava Kumar, 2014, Plitical Philosophy of Ambedkar Kalpaz Publication, New Delhi
9. Badri narayan:2014, Kanshiram, Leader of the Dalits ,London, Pengvin Books India Pot Ltd
10. Surinders J. Jodhkar:2012Caste, New Delhi, Ootid Univertyy Pera
11. B.R. Ambedkar Volumes
12. Valerian Rodrigves, 2008 Dalit-Bahryan Discourse in Muderu India, New Delhi critical event publication
13. Piyasena Dissanayake:2009 Elementary Aspects of Biddeit Political Theory New Delhi, Critical Quest
14. B.R. Ambedkar; 2004 conversion as Emancipatio: Critical Quest publication.
15. Sauda Aruna:2015 Ambedkar Varna Nirmulana-Annihilation of caste (Philosophy of Castedemocracy), Chennai saibonds Print System
16. Rahul Govind: 2018: Ambedkars Lessons, Ambedkars Challenges: Hinduism, Hindutva and the Indian Nation & PW, January 27,2018, Vol, VIII No.4

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

Common Course for M.A. Political Science and Public Administration
FOURTH SEMESTER SYLLABUS

Revised in 2018-2019

CORE – 405(a) GOOD GOVERNANCE AND INFORMATION TECHNOLOGY

Unit-I Concepts of Governance

- (1) **E-Governance** - Philosophy of Technology –
Accountability: Social Dimension - Good Governance
- (2) **IOT- (Internet of Things) - Machine Learning Based Solution - E-Judiciary**

Unit-II

- (1) Information Revolution: Strategic Restructuring Governance
- (2) **IT Policies**

Unit-III

- (1) Data-Governance
- (2) Digital Divide

Unit-IV

- (1) Issues and Challenges in E - Governance caused by Privacy Threats
- (2) **Digital Democracy**: Digitalizing the Future

Selected Readings:

1. Anthony G. Wilhelm: 2004: Digital Nation towards an inclusive information Society: The MIT press London.
2. Ernest J Wilron III : 2004: The Information Revolution and Developing Countries, MIT Press, London.
3. T.M. Vinod Kumar ed, 2017, E- Governance for smart Cities, Springer Publication
4. T.M. Vinod Kumar ed, 2014, E- Governance for smart Cities, Springer Publication
5. Gilardi, Fabrizio: 2016 Digital Democracy
6. Van Dij K J A GM 2014 Digital Democracy Vision & Reality: Public Administration in the information Age
7. Gil de Zuniga, Homero (ed) 2010 Digital Democracy” Reimagining pathways to Political participation : journal of information Technology X Politics
8. Simon Julie (ed) 2017 Digital Democracy
9. Ashwani Saith, M Vijay Baskar 2005 ICTS and Indian Economic Development
10. M. P Gupta, 2004 Promise of E-Governance operational challenges Tata MC Graw Hill Publishing Company Ltd. New Delhi
11. World Bank: Websites on Governance, E-Governance & Internet etc.
12. Roger Brownsword, Eloise Scotford, Karen Yeung: 2016 The Oxford Handbook of Law Regulation and 13. Technology: Oxford Publication, London
13. Mohit Bhatta charya 2012 Public Administration : New Issues and Perspectives jawahar Publishers Distributions, New Delhi
14. Francesco Contini Giovan Francesco: 2008 ICT and innovation in the Public sector : European studies in the making of E – Government: Palgrave publication
15. Charalambos, Vrasidas, Michalinos zembylas : 2009 ; ICT for Education , Development and Social Justice: Current Perspectives on Applied Information Technologies Information Age Publishing

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DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

FOURTH SEMESTER SYLLABUS (Revised in 2018-2019)

Elective Paper

CORE-405 (b) : HUMAN RIGHTS IN INDIA

Unit - 1

1. Philosophical Foundations of Morality and State.
(Liberal, Marxist and Humanist Perspective)
2. Human Rights and World order.

Unit - II

1. Fundamental Rights (1st generation rights)
and Cultural Rights (3rd generation rights/munity)
2. Directive Principles of State icy (2nd generation) .

Unit - III

1. Political and Legal
2. Socio-Economic disparities and Terrorism

Unit - IV

1. Complaints, Investigations, Commissions and Judicial Acts
2. Children, Women, Old, Disabled, Professional Victims,
Socially and Economically Deprived

BOOKS:

1. H.O. Aggarwal : Human Rights (3rd edition) Central Law Publications, Allahabad, 2000
2. G. Haragopal : Political Economy of Human Rights, Emerging Dimensions (Himalaya Publishing House, New Delhi, 1977)
3. Sir Francis Uallat : An Introduction to the study of Human Rights (Europa Publications, London, 1972)
4. Tim Dunne & Nichlas : Human Rights in Global Politics (Cambridge University Press, J. Wheeler Cambridge, 1999)
5. : Human Rights, The task before US (International Federation of Universal Women, London, 1951)
6. R.V.R. Chandrasekhara Rao : Human Rights for whom? A perspective on Human Rights Discourse in perspectives on Indian Development

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

FOURTH SEMESTER SYLLABUS - Revised in 2018-2019

Elective Paper

CORE:405 (c):SOCIAL WELFARE ADMINISTRATION

Unit-I

1. Social Welfare – Concept and Philosophy
2. A Brief History of Welfare and Development

Unit-II

1. Welfare Schemes for Women and Programmes Relating to SC, ST and BCs
2. Social Welfare Constitutional Provisions

Unit-III

1. Social Welfare Policy of the Union and the State Government
2. Central and State Social Welfare Boards

Unit-IV

1. Central Social Welfare Board: Composition Powers and Functions
2. Role of Non-Governmental Organizations in Socio-Economic Development and Problems in Implementation of Social Welfare Programmes.

Suggested Readings:

- 1) Sachdeva, D.R. (2004). Social Welfare Administration (English and Hindi), Kitab Mahal, Allahabad.
- 2) Davis C.March. (1965). An Introduction to Social Administration, Routledge and Kegan Paul, London.
- 3) Kulkarni, P.D. (1961). Centre Social Welfare Board, Asia Publishing House, New Delhi.
- 4) Jaganadhan, V. (1966). Social Welfare Organisation, IIPA, New Delhi.
- 5) Paul Chowdary, D. (1979). Social Welfare Administration, Atma Ram & Sons, New Delhi.
- 6) Goel, S.L. and R.K.Jain (1988). Social Welfare Administrative, Deep & Deep, New Delhi.
- 7) Chaturvedi, T.N. and S.K.Chandra (1980). Social Administration Development and Change, IIPA, New Delhi.
- 8) Chowdhary, D.P. (1992). Social Welfare Administration, Atma Ram & Sons, Delhi.
- 9) Mohinder Singh (ed)(1996). Social Policy and Administration in India, M.D. Publications Pvt.Ltd., New Delhi
- 10) Surendra Kataria (2002). Social Administration, RBSA Publishers, SMS High Way, Jhaipur

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DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

FOURTH SEMESTER SYLLABUS - Revised in 2018-2019

Elective Paper

CORE-405 (d):DISASTER MANAGEMENT

Unit-I

1. Meaning, Objectives and Importance of Disaster Management.
2. **Effectiveness of Disaster Management**

Unit-II

1. Tools, Techniques and **Theories of Disaster Management**
2. Types and Effects of Disaster Management (Drought, Earthquake, Natural Calamities, Rehabilitation, Displacement and Communal Riots).

Unit-III

1. Manmade Disaster – Bhopal Disaster.
2. Safety Provisions at Indian Nuclear Plant, Accidental Explosives and Management of Emergencies.

Unit-IV

1. **Risk and Causality Management**, Role of Red Cross Society, Armed Forces, Panchayati Raj, NGOs and ICT in Disaster Management.
2. **Resource Mobilization** and Peoples Participation for Effective Disaster Management

Suggested Readings:

- 1) Parasuraman: India Disaster Report.
- 2) Bhattacharya: Environmental Economics.
- 3) Ram Prakash: Disaster Management.
- 4) Mollinga : Integrated Water Resource Management
- 5) Narayana: Disaster Management.
- 6) N Ram Mohan Prakash, (2014) Risk Management and Insurance, Students Helpline Publishers Pvt Ltd, Hyderabad.

YOGI VEMANA UNIVERSITY

DEPARTMENT OF POLITICAL SCIENCE & PUBLIC ADMINISTRATION

FOURTH SEMESTER SYLLABUS - Revised in 2018-2019

Elective Paper

CORE-405(e):OFFICE ADMINISTRATION

Unit-I:

1. Nature, Scope and Importance of **Office Management**
2. Basic Principles of **Office Organization**

Unit-II:

1. Office Planning and Lay out of Office Management.
2. Office Equipment and Office Services

Unit-III:

1. Filing System, Record Management, Office Communication and Correspondence
2. Office Supervision , Office Stationary, Training and Staff Welfare

Unit-IV:

1. O & M –Work Study, Work simplification and Work Measurement.
2. **Office Management in Government**- Some Issues.

Suggested Reading

- 1) V.SP.Rao &P.S Narayana- TextBook of Office Management,Tata Mc Graw Hill New Delhi,1937
- 2) J.C.Denyer - Office Organisation & Management, Principle and Practice, S.Chand &Sons, New Delhi, 1990.
- 3) S.R.Chunwalla - Management R.Srinivasan Principles and Practice.
- 4) Terry and Franklen - Principles of Management
- 5) S.L.Goel - Modern Management Techniques
- 6) H.Koontz & O.Donnel - Essentials of Management
- 7) Z.K.Quible - Introduction to Administration Office Management
- 8) S.P.Arora - Office Organization and Management, Vikas Publishing House, New Delhi, 1982.
- 9) Aswathappa & Shridhara Bhat.K- Office Management
- 10) George R.Terry - Office Management & Control
- 11) Jonson and Savage - Administrative Office Management
- 12) P.N.Reddy and H.P.Appanaich -Office Organisation and Management, Himalaya Publishing House, New Delhi, 1990.
- 13) B.Sudeer & M Mohan, (2014) Management Information System, Students Helpline Publishers Pvt Ltd, Hyderabad

13004: Mathematical Foundations for Computer Applications

UNIT-I:

MATRIX ALGEBRA - Matrices - Rank of a matrix - Solving system of equations - Eigenvalues and Eigenvectors - Cayley - Hamilton theorem - Inverse of a matrix.

UNIT-II:

BASIC SET THEORY - Basic definitions - Venn diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion – Partitions - Permutation and combination – Relations - Properties of relations - Matrices of relations - Closure operations on relations - Functions - Injective, subjective and objective functions.

UNIT-III:

MATHEMATICAL LOGIC - Propositions and logical operators - Truth table - Propositions generated by a set - Equivalence and implication - Basic laws - Some more connectives - Functionally complete set of connectives - Normal forms - Proofs in propositional calculus - Predicate calculus.

UNIT-IV:

FORMAL LANGUAGES-Languages and grammars - Phrase structure grammar - Classification of grammars - Pumping lemma for regular languages - Context free languages. **FINITE STATE AUTOMATA**-Finite state automata - Deterministic finite state automata (DFA) - Non deterministic finite state automata (NFA) - Equivalence of DFA and NFA - Equivalence of NFA and Regular Languages.

TEXT BOOKS:

1. David Makinson, "Sets, Logic and Maths for Computing", Springer Indian Reprint, 2011.
2. Grimaldi, R.P and Ramana, B.V. "Discrete and Combinatorial Mathematics", 5th Edition, Pearson Education, 2006.

REFERENCE BOOKS:

1. Hopcroft J.E and Ullman,J.D, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, Delhi, 2002.
2. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", Tata McGraw Hill, 4th Edition, 2002.
3. Sengadir, T. "Discrete Mathematics and Combinatorics" Pearson Education, New Delhi, 2009.
4. Trembley, J.P. and Manohar, R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill, New Delhi, 2007.
5. Venkataraman, M.K., "Engineering Mathematics", 2nd Edition, Volume-II, National Publishing Company, 1989.

23003: Advanced Data Base Management Systems

UNIT-I:

The Entity – Relationship Model-Constraints-Entity-Relationship Diagrams, Design Issue-Weak Entity Sets- Database Design for Banking Enterprise- The Unified a Modeling Temporal Data- User Interfaces and Tools- Triggers-**Authorization in SQL.**

UNIT-II:

OBJECT- DATABASES AND XML: Object-based databases – Complex data types, structured types and inheritance in SQL, table inheritance, array and multiset types in SQL, object identity and reference types in SQL, implementing O-R features, Persistent programming languages, OO vs OR. XML – Structure of XML, Document Schema, Querying and Transformation, API in XML, XML applications.

UNIT-III:

Query Processing: Measures of Query Cost-Selection Operation-Sorting-Joint Operation-Evaluation of Expressions-Query Optimization: Transformation of Relational Expressions-Estimating Statistics of Expression Results-Choice of Evaluation Plans.

UNIT-IV:

Transactions: Transaction concept, Transaction State-Implementation of Atomicity and Durability-Concurrent Executions – Serializability - Recoverability - Implementation of Isolation - Testing for Serializability, Concurrency Control: Lock Based Protocols- Timestamp-Based Protocols-Validation-Based Protocols-Multiple Granularity- Multiversion Schemes-Deadlock handling-Insert and Delete Operations-Weak Levels of Consistency-Concurrency in Index Structures,

Recovery System: Failure Classification-Storage Structure-Recovery and Atomicity-Log-Based Recovery- Recovery with Concurrent Transactions-Buffer Management-Failure with lose of Nonvolatile Storage-**Advanced Recovery Techniques-Remote Backup Systems.**

TEXT BOOKS:

1. Silberschatz A. Korth H F, and Sudarsan S, *Database System Concepts*, 5th edition, McGraw-Hill 2002. (Chapters 1to 4, 6 to 10 and 13 to 17)

REFERENCE BOOKS:

1. Date C J, *An Introduciton to Database Systems*, 7th edition, Pearson Educaiton, 2000.
2. Elmasri R, and Navathe S B, *Fundamentals of Database Systems*, 4th edition, Pearson Education, 2004.
3. Ramakrishnan R, and Gehrke J, *Database Management Systems*, 2nd edition, McGraw-Hill, 2000.
4. Mannino M V, *Database Application Development and Design*, McGraw-Hill, 2001.

23003P: Advanced Data Base Management Systems Laboratory

1. Write a **PL/SQL Block** for demonstrating the GOTO statement
2. Write the PL/SQL Block for generating the prime numbers & also counting the no. of prime number using procedure concept.
3. Write a PL/SQL Block for calculating area & Perimeter of a rectangle.
4. Write a PL/SQL Block to find out **Factorial of a given number using functions.**
5. Write a PL/SQL program for illustrating the stored procedures
6. Write a PL/SQL Block for illustrating implicit cursors.
7. Write a PL/SQL Block for demonstrating explicit cursors.
8. Write a Trigger on insert before operation with suitable relation.
9. Write a Trigger on update operation before with suitable relation
10. Write a PL/SQL Block for illustrating the pre-defined exceptions.
11. Write a PL/SQL Block for demonstrating user defined exceptions.
12. write a PL/SQL block for illustrating the creation and **usage of a package specification & package**
body.

33004: Optimization Techniques

UNIT – I

Linear Programming Problem: Introduction – Mathematical Formulation of the Problem Linear Programming Problem Graphical Solution: Some Exceptional Cases – General Linear Programming Problem – Canonical and Standard Forms of LPP. Simplex Method: The **Computational Procedure** of Simplex Method, Big-M Method, Two-Phase method, and some simple problems.

Duality in Linear Programming: **Formulating a Dual Problem** – Primal – Dual Pair in Matrix Form – Duality and Simplex Method – Dual Simplex Method – Degeneracy and Some related problems

UNIT – II

Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Duality in Transportation Problem – Loops in Transportation Tables – LP Formulation of the Transportation Problem – Solution of a Transportation Problem – Finding an Initial Basic Feasible Solution – Testing for Optimality – Degeneracy in Transportation Problem – **Transportation Algorithm (MODI Method)**, Unbalanced Transportation Problem.

Assignment Problem: Introduction – Mathematical Formulation of the Problem – The Assignment Method – Special Cases in Assignment Problems – The Traveling Salesman Problem

UNIT – III

Sequencing Problem: Introduction – Problem of Sequencing – Basic Terms Used in Sequencing – Processing n Jobs through Two Machines - **Processing n Jobs through K Machines** - Processing 2 Jobs through K Machines

Games and Strategies: Introduction – Two – Person Zero – Sum Games – Some Basic Terms – The Maximin – MiniMax Principle – Games without Saddle Points – Mixed Strategies – Graphic Solution of $2 \times n$ and $m \times 2$ Games – Dominance Property – Arithmetic Method For $n \times n$ Games – General Solution of $m \times n$ Rectangular Games

UNIT – IV

Network Scheduling by PERT / CPM: Introduction – Network and Basic Components – Rules of Network Construction – Critical Path Method, PERT, Probability Considerations in PERT, **PERT Calculations** – Distinction between PERT and CPM, Some Samples Problems

TEXT BOOK:

1. Operations Research by – Kranti Swarup, Gupta, Manmohan – Sultan Chand & Sons, New Delhi, 2003 (11th Edition)

REFERENCE BOOKS:

1. Hiller F.S. & Liberman G.J.: Introduction to Operations Research 2nd Edn.: - Holand Day Inc. London, 1974
2. Tara H.A.: Operation Research, 3rd Edn.- McMillan Publishing Company, 1982
3. Beightler C.S. & Phillips D.T.: Foundations of Optimization,- Prentice Hall, 1979
4. McMillan Claude Jr.: Mathematical Programming, 2nd Edn.- Wiley Series, 1979
5. Gillett B.G.: Introduction to Operation Research - A Computer oriented Algorithmic approach- McGraw Hill Book Comp., 1976
6. N.S. Kambo: Mathematical Programming Techniques

PRACTICALS

33001P: Object Oriented Programming Through JAVA Laboratory

1. Programs to illustrate constructors.
2. Programs to illustrate **Overloading & Overriding methods in JAVA.**
3. Programs Illustrate the Implementation of Various forms of Inheritance. (Ex. Single, Hierarchical, Multilevel inheritance...)
4. Program which illustrates the implementation of multiple Inheritance using interfaces in JAVA.
5. Program to illustrate the implementation of abstract class.
6. Programs to illustrate Exception handling
7. Programs to create packages in Java.
8. Program to **Create Multiple Threads in Java.**
9. Program to Implement Producer/Consumer problem using synchronization.
10. Program to Write Applets to draw the various polygons.
11. Create and Manipulate Labels, Lists, Text Fields, Text Areas & Panels
12. Handling Mouse Events & Keyboard Events.
13. Using Layout Managers.
14. Create & Manipulate the Following Text Areas, Canvas, Scroll bars, Frames, Menus, Dialog Boxes.
15. Programs, which illustrate the manipulation of strings.
 - a. Ex. 1. Sorting an array of Strings.
 2. Frequency count of words & Characters in a text.
16. Programs, which illustrate the use of Streams.
17. Java Program that reads on file name from the user and displays the contents of file.
18. Write an applet that displays a simple message.
19. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Otherwise the interest rate is annual.
20. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
21. Write a Java program for handling mouse events.
22. Write a Java program for creating multiple threads
23. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
24. Write a Java program that lets users create Pie charts. **Design your own user interface (with AWT)**
25. Write a Java program that allows the user to draw lines, rectangles and ovals.
26. Write a Java program that illustrates how run time polymorphism is achieved.

43004A: Formal Language Automata Theory

UNIT 1:

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

Finite Automata : NFA with ϵ transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT 2:

Regular Languages : Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

UNIT 3:

Context Free Grammars : Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

Push Down Automata : Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT 4:

Turing Machine : Turing Machine, definition, model, design of TM, Computable functions.

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation" Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson

REFERENCE BOOKS:

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. "Elements of Theory of Computation" Lewis H.P. & Papadimition C.H. Pearson /PHI.
- 4 Theory of Computer Science – Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI

43004B: Information Systems

UNIT I

Overview of System analysis and design: Development life cycle, Requirements determination, **Logical design**, Physical design, Program design, Risk and feasibility analysis, **SRS**, prototyping

UNIT II

Information requirement analysis: Process modelling with physical and logical data flow diagrams, Data modelling with entity relationship diagrams, Addition modelling method, **Developing proposal**: feasibility studies, **cost benefit analysis**.

UNIT III

System design: Process descriptions, Input/output controls, object modelling, **Database design**, and User Interface design, Documentation

UNIT IV

Introduction to - Project management, scheduling, measurement of quality and productivity, **ISO** and capability maturity models, **Strategic planning**, system audit. Quality assurance: reviews, walkthroughs, and inspection.

REFERENCE BOOKS:

1. Analysis & Design of Information Systems, Senn,MH.
2. Information Systems :Analysis & Design, Ram Bansal 'Vigyacharya',New Age International
3. Analysis, Design of Information System,Rajaraman, PHI
4. System Analysis & Design, Parthasarathi,EPH
5. System Analysis, Design & MIS, EXCEL BOOKS
6. Analysis, Design & implementation of Information Systems, Sharma, VIKAS
7. System Analysis & Design Hand Book, V.K. Jain, Wiley Dreamtech

43004C: Machine Learning

UNIT - I

Introduction - Well-posed learning problems, designing a learning system Perspectives and issues in machine learning

Concept learning and the general to specific ordering – Introduction, A concept learning task, concept learning as search, Find-S: Finding a Maximally Specific Hypothesis, Version Spaces and the Candidate Elimination algorithm, Remarks on Version Spaces and Candidate Elimination, Inductive Bias.

Decision Tree Learning – Introduction, Decision Tree Representation, Appropriate Problems for Decision Tree Learning, The Basic Decision Tree Learning Algorithm Hypothesis Space Search in Decision Tree Learning, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning. **UNIT - II**

Artificial Neural Networks Introduction, Neural Network Representation, Appropriate Problems for Neural Network Learning, Perceptions, Multilayer Networks and the Back propagation Algorithm. Discussion on the Back Propagation Algorithm, An illustrative Example: Face Recognition **Evaluation Hypotheses** – Motivation, Estimation Hypothesis Accuracy, Basics of Sampling Theory, A General Approach for Deriving Confidence Intervals, Difference in Error of Two Hypotheses, Comparing Learning Algorithms.

UNIT - III

Bayesian learning - Introduction, Bayes Theorem, Bayes Theorem and Concept Learning Maximum Likelihood and Least Squared Error Hypotheses, Maximum Likelihood Hypotheses for Predicting Probabilities, Minimum Description Length Principle , Bayes Optimal Classifier, Gibbs Algorithm, Naïve Bayes Classifier, An Example: Learning to Classify Text, Bayesian Belief Networks, EM Algorithm. **Computational Learning Theory** – Introduction, Probably Learning an Approximately Correct Hypothesis, Sample Complexity for Finite Hypothesis Space, Sample Complexity for Infinite Hypothesis Spaces, The Mistake Bound Model of Learning.

Instance-Based Learning – Introduction, k-Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning.

UNIT - IV

Pattern Comparison Techniques, Temporal patterns, Dynamic Time Warping Methods, Clustering, Codebook Generation, Vector Quantization

Pattern Classification: Introduction to HMMS, Training and Testing of Discrete Hidden Markov Models and Continuous Hidden Markov Models, Viterbi Algorithm, Different Case Studies in Speech recognition and Image Processing

Analytical Learning – Introduction, Learning with Perfect Domain Theories: PROLOG-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operations.

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis.

TEXT BOOKS:

1. Machine Learning – Tom M. Mitchell, MGH
2. Fundamentals of Speech Recognition By Lawrence Rabiner and Biing – Hwang Juang.

REFERENCE BOOKS:

1. Machine Learning : An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

53004B: Wireless & Ad-hoc Networks

UNIT-I:

Introduction: Introduction to Wireless Networks, Various Generations of Wireless Networks, Virtual Private Networks- Wireless Data Services, Common Channel Signaling, Various Networks for Connecting to the Internet, Blue tooth Technology, Wifi-WiMax- Radio Propagation mechanism , Pathloss Modeling and Signal Coverage

UNIT-II:

Wireless Adhoc Networks: Basics of Wireless Networks, Infrastructured Versus Infrastructureless Networks – Properties of Wireless, AD hoc Networks, Types of Ad Hoc Networks, Challenges in AD Hoc Networks – Applications of Wireless AD Hoc Networks

UNIT-III:

Routing Protocols for Ad Hoc Networks:Introduction-Proactive Routing Protocols- Reactive Routing protocols-Hybrid Routing Protocols-QoS Metrics-Energy impact issues in Routing.

UNIT-IV:

Mobile Ad Hoc Networks (MANETs): Overview, Properties of A MANET, Spectrum of MANET Applications, Routing and Various Routing Algorithms. Other Wireless Technologies: Introduction, IEEE 802.15.4 and Zigbee, General Architecture, Physical Layer, MAC layer, Zigbee, WiMAX and IEEE 802.16, Layers and Architecture, Physical Layer, OFDM Physical layer.

TEXT BOOKS:

1. Principles of Wireless Networks , Kaveth Pahlavan, K. Prasanth Krishnamurthy, Pearson Publications, Asia, 2002
2. Mobile Cellular Communications, G.Sasibhusan Rao, "", Pearson Publications.

REFERENCES BOOKS:

1. Guide to Wireless Ad Hoc Networks: Series: Computer Communications and Networks, Misra, Sudip; Woungang, saac; Misra, Subhas Chandra, 2009, Springer

53004D: Grid Computing

UNIT I

Introduction – Early Grid Activities, Current Grid Activities, an overview of Grid business areas, Grid applications, **Grid infrastructure** – Grid computing organizations and their roles – Grid computing Anatomy – **Grid computing Roadmap**

UNIT II

Service-Oriented and ,Web Service Architecture- **XML Messages** and enveloping – Service message description mechanisms, relationship between web and grid service – Sample use cases that drive OGSA – The OGSA Platform components

UNIT III

A high level introduction to OGSI – Technical details of OGSI specification, Service data concepts - Grid Service: Naming and change Management – OGSA Basic Services: Common Management Model, Service domains, Policy and Security Architecture

UNIT IV

The **Grid Computing Toolkits** – GLOBUS GT3 Toolkit: Architecture - GLOBUS GT3 Toolkit: Programming Model

TEXTBOOK

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson-2004.

REFERENCE

1. Ahmar Abbas, "Grid Computing: A Practical Guide to technology and Applications", Firewall media – 2006.

53005A: Enterprise Application Integration

UNIT I

Defining EAI : What Is EAI?, Applying Technology, How Did Things Get This Bad?, Chaos Today, Order Tomorrow.

Evolution of Stovepipes: Traditional Systems, Microcomputer Systems, Distributed Systems, Packaged Applications.

Making the Business case for EAI: The Virtual System, **E-Business**, Types of EAI.

UNIT II

Data-Level EAI: Going for the Data, Data-Level EAI by Example, Database-to-Database EAI, Federated Database EAI.

Consider the Data Source: Relational Data, Object-Oriented, Multidimensional, Other Data Storage Models

Application Interface-Level EAI: Application Interfaces, What's an API?, Interface by Example, Approaching Application Interfaces, The Interface Tradeoff, Packaged Applications, Custom Applications.

UNIT III

Method-Level EAI: Method-Level Example, What's a Process?: Scenarios, Rules, Logic, Data, Objects.

Method Warehousing: Leveraging Frameworks for EAI, Enabling Technology, Sharing Methods to Bind Your Enterprise.

User Interface-Level EAI: Leveraging User Interface-Level EAI, Going to the User Interface.

UNIT IV

The EAI Process—Methodology or Madness?: Applying a Procedure/Methodology, Understanding the Enterprise and Problem Domain, Making Sense of the Data, Making Sense of the Processes, The Common Business Model, Identifying Application Interfaces, Identifying the Business Events, Identifying the Schema and Content Transformation Scenarios, Mapping Information Movement, Applying Technology, Testing, Testing, Testing, Considering Performance, Defining the Value, Creating Maintenance Procedures, Method or Madness?

TEXT BOOKS

1. David S. Linthicum, Enterprise Application Integration, Addison Wesley Information Technologies Series, printed December 2003.

53005C: Software Testing

UNIT-I:

Building a software Testing strategy, software Test Design Techniques, software Testing tools and selection of Test Automation products.

UNIT-II:

Software Testing Life cycle and software testing process, testing Effort estimation and test planning, software test effort estimation technique.

UNIT-III:

Pre-Development testing: requirements and Design phase, Best practices in program phase: UNIT Testing, System Testing and integration testing, case study on acceptance testing.

UNIT-IV:

Implementing and Effective Test Management Process, Building and Effective test organization, performance issues and optimization techniques.

TEXT BOOKS:

1. Renu Rajani and pradeep Oak,, software testing, tata Mc Graw Hill.

Semester -1
Paper – 104 – Telugu Journalism

Unit-I:

Brief History and Development of Telugu Press - Contribution of Telugu Press to freedom struggle and social reform movement - Pioneers of Telugu Press - **Kandukuri Veeresalingam**, Mutnuri Krishna Rao, Kasinathuni Nageswar Rao Panthulu, **Narla Venkateswara Rao** and others.

Unit-II:

Post emergency and Contemporary Telugu press - Study of Content and Design of contemporary Telugu newspapers - **Trends in Telugu Journalism**, Politicization of Telugu Journalism - **Magazines in Telugu**

Unit-III:

Brief overview of Telugu Radio Stations and Television Channels- **Radio Programming in Telugu – 24 Hours news channels in Telugu – T.V. Programming in Telugu Channels**

Unit-IV:

Study of language and style – SVO formula – Punctuation, Sentence Structure – Objectivity – Concision - Translation Techniques – Problems of Translation

Reference Books:

Rayaprolu AnandaBhaskar: Journalism Charitra Vikasam
Pothuri Venkateswara Rao: Telugu Patrikalu - Andhraajathi Akshara Sampada
Narla Venkateshwara Rao: Prabhanda Parijatam
Uma Shankar, Joshi & PandurangaRao: Art of Translation
Rachamalla Ramachandra Reddy: Anuvada Samasyalu
Nagasuri Venugopal: Media Nadi

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SEMESTER-2

Paper - 206: Practical -1 - Radio writing skills

The students will be tested for their writing skills for Radio programmes. The candidate needs to write a test for 50 marks in a time of one and half hours. The practical examination shall be conducted by the faculty member drawn from interdisciplinary departments of Yogi Vemana University / from other Universities and marks would be awarded by him along with the concerned faculty member of the Department. Students will be asked to write Script as mentioned below.

- **Recording and writing Script writing for 2 minute Radio Ads, Jingles, Spots etc.**
- Recording and writing Script for a 15 minute News Feature with headlines & news
- **Recording and writing script for 15 minutes Radio Documentary.**
- **Recording and writing script for Radio Interview**
- Recording and writing script for a musical or song based programme / satire etc.

SEMESTER-2

Paper - 206: Practical -2 – Television Writing Skills

The students will be tested for their Television writing skills. The candidate needs to write a test for 50 marks in a time of one and half hours. The practical examination shall be conducted by the faculty member drawn from interdisciplinary departments of Yogi Vemana University / from other Universities and marks would be awarded by him along with the concerned faculty member of the Department. The students will be asked to write Script for Television news, T.V. Feature as mentioned below

- **Writing Television News Script, Reporter, Anchor Script, T.V Documentary Script**
- Shooting and Editing VOX-POP project on any subject for 2-3 minutes
- **Shooting & Editing a news bulletin for 15 – 20 minutes in AV, AVO or AVOSOT formats**
- Shooting and Editing an Interview for 10-15 minutes.

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SEMESTER-3

Paper – 301 – Photo Journalism

Unit 1

History of Photojournalism - Difference between a Photographer and Photojournalist -**Photography for different media**- Newspaper, Magazine, Internet - Importance of visuals in Journalism - **Types of Photojournalism** – Sports, Travel, Still, Science, War and Wildlife Photojournalism

Unit 2

History of Photography -Types of Digital cameras- Key components of DSLR, Lens elements, Mirror, Viewfinder, Sensor, Resolution, Memory cards – Working of DSLR Camera, Basic Principles, Auto Focus , Light controls - Aperture, Shutter, Exposure, Lenses - Zoom, - Use of Lenses - **Lighting Methods** - Using of Camera Accessories, Filter, Reflector, Lens hood, Tripod

Unit -3

Picture Composition- Rule of Thirds, Symmetry, Geometry, Shape, – Shot, Classification of shot, Effect of Focal length on Perspective and angle of view, Frame, lens angle, Headroom, Nose room - Photo Captions - Photo Editing

Unit -4

Ethical and Legal Issues- Staging versus Truthfulness- Treating subjects with respect- Privacy - Public interest visuals - Photography in the age of new Digital technology - Photo Magazines, Photo freelancing as a profession.

Reference Books

Parrish, Fred S: Photojournalism: An Introduction
Brill, Betsy: Photo Journalism: The Professionals' Approach
Hoy, Frank P: Photojournalism: The Visual Approach.
McCartney, Susan: Mastering the Basics of Photography
Drew, Helen. The Fundamentals of Photography
Chapnick, Howard: Truth Needs No Ally: Inside Photojournalism

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SEMESTER-3

Paper - 303: Social Media

UNIT 1

Social Media – Definition, Characteristics – Concepts of Web 2.0, User Generated Content – Mainstream Media Vs. Social Media – **Globalization and Social Media** – Social Media as a tool of communication – Use and misuse of Social media.

UNIT 2

Social Media Types - Social Communities - Text Publishing Tools – Micro-blogging Tools - **Photo Publishing Tools** - Audio Publishing Tools- Video Publishing Tools - Social Gaming Tools- Really Simple Syndication - Theories of Social media – Revisiting Diffusion of Innovation, Social Exchange, Social Penetration, Social Presence

UNIT 3

Social media and their impact on Radio, TV and Newspapers - Public participation and Social Media; Networked Societies - Credibility of information – Social Media impact on Politics and Culture

UNIT 4

New Media and Society - New media and New Audience - **Social Change Communication and New Media** - Civil Society and New Media - New media and Popular Culture, New media and Networked Activism

Reference books

Leah A. Lievrouw & Sonia Livingstone: The Handbook of New Media
Albarran and Goff: Understanding the Web
Crispin Thurlow, Laura Lengel: Computer Mediated Communication
Balan K.R.: Conspectus for information & Communication
Ghosh, Avik: Communication Tech. & Human Development
Jones, Steve: Doing Internet Research
Albarran, Allan B, Goff .David H: Understanding the web
Neth, Shyama: Assessing the state of Web Journalism
Syed, M.H: Journalism and Information Technology
Hassan, Robert: The information society
Frank Webster: Theories of Information Society

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SEMESTER-3

Paper – 305 – Corporate Communications

Unit-1

Corporate Communication– Definition - Scope - Functions - Evolution of Corporate Communication in India, Corporate Communication vis-à-vis Public Relations - Professional bodies in PR / Corporate Communication – PRSI, IPRA, Professional code of ethics; PR digital platforms, Use of Social Media, PR Pioneers, P.T. Barnum, Ivy Lee, Rex Harlow, Edward Bernays, Carl Byoir, George Creel, C.V. Narasimha Reddy - Important PR Agencies in India

Unit II

Media Relations- Benefits of media relations, Public Relations and Media, Media Relations tools and techniques – Press Conference, Press Tour. Preparing Press Kits - Writing Press Releases

Unit III

Corporate Reputation Management and Crisis Communication – Corporate Reputation, Image repair theory, Building corporate identity - Crisis Management, Crisis vs. problem, Guidelines for preparedness and planning, Crisis Response Strategy

Unit IV

Various applications of Corporate Communication - Community Relations and CSR, Employee Communication, Investor Relations, Government Relations, Customer Relations, Corporate Communication in Brand Promotion - Corporate Communication and ethics, Legal aspects of Corporate Communication – CSR and Media Originations – Case Studies

Reference Books:

Jethwaney, Jaishri : Corporate Communication – Principles and Practice,
Sachdeva, Iqbal S: Public Relations – Principles and Practices,
Black, Sam: Practical Public Relations
Ries, Al & Reis, Laura: The Fall of Advertising and the Rise of PR.

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SEMESTER -3

Non –Core Paper – Paper – 307 –Basics in Photography & Videography

UNIT - 1:

History of Photography- **Various parts of camera** - Key components of DSLR- light path, lens elements, mirror, viewfinder, sensor, resolution, memory cards – Working of digital Camera - Basic Principle, Auto Focus , Light controls- Aperture, Shutter, Exposure, Lenses – Zoom - Use of Lenses – Using of Camera **Accessories** – Filter, Reflector, Lens hood, Tripod

UNIT - 2:

Picture Composition- Rule of Thirds - Headroom, Nose Room, Depth of field & Depth of Focus techniques - **Branches of photography**- Nature, Still, Architecture, Wedding, Sports, Photo Journalism – Photo Editing

UNIT-3:

Types of Video Cameras – White and Black Balance - Camera Angles – Camera Movements – 180⁰ axis of action rule - Basics of Lighting- Tripod Setting – Tracks and Trolleys –Use of lenses - **Outdoor and Indoor Shooting**

UNIT – 4:

Single and Multiple camera productions – Types of Shots, Scenes, Sequence - Types of video formats – Audio equipment – Mikes

Reference Books

- Burrows, Thomas D., et.al: *Video Production: Disciplines and Techniques*
- Zettl,H.: *Handbook of Television Production*
- Rabinger, Michael: *Directing the Documentary*
- Shelley, S.L.: *A Practical Guide to Stage Lighting*
- Compesi, Ronald J et.al: *Video field Production and Editing*

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SEMESTER-4

MJMC 402: International Media Studies

UNIT 1

Definition, Nature and Scope of International Communication - Characteristics of International Communication - Objectives of International Communication - **Types of International News** - Channels of International Communication, - International communication and National identity

UNIT 2

United Nations Educational, Scientific and Cultural Organization (UNESCO), New World Information and Communication Order (NWICO), McBride Commission, Non Aligned News Agencies Pool (NAM POOL), International Telecommunication Union (ITU), **SAARC and Mass Media** - International Press Institute (IPI), Association of Newspapers and News Publishers (WAN-IFRA), International Association for Media and Communication Research (IAMCR), Asian Media Information and Communication Centre (AMIC). International Federation of Journalist (IFJ), **International Center for Journalists (ICFJ)**, World Global Investigative Journalism Network (GIJN), International Consortium of Investigative Journalists (ICIJ)- Watergate Scandal, Pentagon Papers, Paradise Papers, Panama Papers, Reporters Without Borders

UNIT 3

International News Papers - The New York Times, The Wall Street Journal, The Times, The Guardian, and People's Daily. International News Agencies- AP, UPI, Reuter, AFP, IPS, TASS, DPA, Interfax News, Kyodo News, CCTV+ - International Magazines -Time, Forbes, Reader's Digest, Fortune, Vogue, National Geographic, **ESPN The Magazine** - International Radio Broadcasters, BBC Radio, Voice of America (VOA), Radio Moscow, United Nations Radio, International News networks CGTN, CNN, BBC, RT, CNBC, AL JAZEERA, France 24.

UNIT 4

International Communication Policies and Media Regulation, Media Policy and Globalization, **Global Media Trends**, Nielsen Holdings, Media companies - Thomson Reuters, Time Warner, **CBS Corporation**, Cox Media Group, News Corp, Viacom, Walt Disney Company, 21st Century Fox, Media Moguls- Rupert Murdoch, Richard Branson, **Stanley Hubbard**, **Anne Cox**

Reference Books

- V. S. Gupta: International Communication
- H.D. Fischer and J. C. Merril: International Communication
- Cees Hamelink: The Politics of World Communication
- Nerbert Schiller: National Sovereignty and International Communication
- Robertson: Communication and Third World

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SEMESTER-4

Paper- 403- Gender and Human Rights

Unit-1

Human Rights, Concept, Meaning, **Evolution- Kinds of Human Rights**, Civil and Political rights, Economic, Social and Cultural Rights - Universal Declaration of Human Rights - International Bill of Human Rights, India and the Universal Declaration -Human rights commissions in India - **NHRC- SHRC** – **Human Rights Organizations**, Amnesty International, Human Rights Watch, FIDH

Unit-2

Vulnerable Groups and Human rights – Rights of Women, Children - Human Rights and Media, **Coverage of Human Rights issues in Newspapers, Television, Films** - Human Rights Agenda setting by Media, Framing of Human Rights issues – Reporting Human Rights Reports.

Unit-3

Gender and Communication - Need for the Study - Gender Values - Feminism - Three waves of Feminism - **Women and International Communication** – WIN News, WINGS, FIRE- Women Communicating Globally – Women’s Magazines in India – Women’s Organizations in India, IMWF, IAWRT

UNIT-4

Feminist Communication Theories – The Structuralism Paradigm, Muted Group Theory, Stand Point Theory - Conversation Analysis - Critical Discourse Analysis - The Post Structuralism Paradigm, Performance and Positioning Theory, **Transgender and Cyborg Theories.** - Post Structuralism Discourse Analysis - Transverse Discourse Analysis

Reference Books

- Donna Allen, Susan J Kaufman, Ramona, R. Rush: Women transforming Communications
Philip Shaver and Clyde Hendrick: Sex and Gender
Karen Boyle: Media and Violence
Marian Meyers. Engendering Blame: News Coverage of Violence against Women
Pamela Creedon and Judith Cramer: Women in Mass Communication.
Charlotte Krolokke & Anne Scott Sorensen: Gender Communication: Theories and Analyses

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SEMESTER-4

Paper – 405 –Communication Research Methodology

UNIT-1

Development of Mass Communication research - Meaning of research, Scientific method – Characteristics – Types of Research – Steps in Research Process – Research areas in Print, Electronic, Advertising, **Corporate Communications, Internet and Social Media.**

UNIT-2

Basic elements of research – Concepts, Definitions, **Types of Variables, Hypothesis – Types of hypothesis, Characteristics of Good Hypothesis, Hypothesis testing - Research designs in Mass Communication, Survey research, Focus Group Method, Experiment, Content analysis, Longitudinal Studies, Historical method –Levels of Measurement** –Types of scales- Reliability, Validity

UNIT-3

Sampling in communications Research: Types, Applications and Limitations - **Tools of data Collection**, Interview, Questionnaire, Schedules, Observation and Case study, Applications and limitations of different methods

UNIT-4

Use of statistics in communication research- Quantitative, Qualitative Research, Descriptive and Inferential Statistics, Parametric and Non-Parametric Statistics - Basic Statistical Tools, Measures of central tendency, Mean, Median and Mode - Measure of Dispersion - Standard deviation, Chi-Square Test, **T- Test –Correlation - Data Presentation, Use of graphics in data presentation**

Reference Books:

- Festinger. L.andKatz. D: Research Methods in the Behavioural Science
- Kerlinger.F. N: Foundation of Behavioural Research
- Krippendorf. K : Content Analysis. An Introduction to Methodology
- Westley Bruce. N and Guido.H: Research Methods in Mass Communication
- Mosor and Kalton : Survey Methods in Social Investigation –
- Walker. J. T: Using Statistics for Psychological Research
- Wilkison and Bhandarkar: Methodology and Techniques of Social Science research
- C. R. Kotari: Research Methodology, Methods and Techniques
- Pauline: Scientific Social surveys and Research:
- Winner & Dominic: Mass Media Research, an introduction.

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ENV- 104
ENERGY RESOURCES

UNIT – I

Basic Concepts of Energy

Energy – Definition – Forms of energy – Kinetic, Potential, Mechanical, Thermal, Electrical, Chemical and Nuclear energy, Energy production and consumption in India

Energy Sources – Conventional and Non – conventional energy sources, Laws of thermodynamics, Carnot cycle.

Firewood – Fossil fuels – Origin – Coal reserves in India – Petroleum and Natural Gas – Reserves in India.

UNIT – II

Conventional energy sources

Conventional energy sources: Energy from fossil fuels, energy from major hydroelectric power, Nuclear Energy – Sources – Nuclear fission and fusion reactions.

Climatic effects of power production.

- Advantages and disadvantages of conventional energy sources.

UNIT – III

Non Conventional Energy sources:

Different Types and Need for non renewable energy sources

Solar power: Importance – Solar collectors – Concentrations – Flat Plate and parabolic Collectors, Solar towers – Non – convective solar pond, Ocean Thermal Energy Conversion (OTEC). Solar Photovoltaic Systems – semi conductors, Solar PV Panel, Solar PV systems and applications.

Wind Energy: Wind Energy Conversion Systems, Application of Wind energy. 3c.

Geothermal Energy: Geothermal Resources in India, small hydro resources in India their advantages, Ocean Energy – Tidal energy, Wave energy.

UNIT –IV

Non conventional energy sources: Emerging technologies and Conservation

Biomass energy – Biomass sources, Biofuels and Biogas –Bio ethanol, Biodiesel production Process - Gasification.

Emerging technologies – Fuel cells, Hydrogen energy

Energy conservation through efficiency and sufficiency measures.

Role of Energy Conservation Act, BEE, Energy for sustainable development.

REFERNCES:

1. Encyclopedia of Environmental Sciences – Environmental Energy Resources. Trivedi R. P and Gurudeep Raj (2005).
2. Renewable Energy Resources. Tiwari G. N and Ghosal M. K., (2005) Narosa.
3. Bioenergy. Desai A. V Wiley Eastern Limited, International Development Research Center, Ottawa, Canada.
4. Non-conventional Energy Sources. Rai G. D., (2001) Khanna Publishers.

ENVIRONMENTAL MICROBIOLOGY AND TOXICOLOGY

UNIT – I

Microbial diversity, Soil microorganisms and their functions, Aeromicroflora, Air borne diseases and allergens, Water borne diseases, Culture media, Types of media, Isolation of pure cultures, Growth curve, **Microorganisms as source of food** – Single Cell Protein – Fermented foods.

UNIT - II

Introduction to Toxicology, Toxicants, Toxicity, Acute, sub-acute and chronic Dose effect, LD₅₀, LC₅₀ and response safe limits, Dose Response relationships, Toxic chemicals in the environment. Biochemical aspects of Arsenic, Cadmium, Lead, Mercury, Carbon monoxide, MIC, Pesticides – Classification, Residual effects, Oceanic pollution by toxic wastes

UNIT – III

Xenobiotics in environment, PCB, Dioxins, Bioindicators, Bioaccumulation, Bioconcentration, Biomagnification, Cell receptors, Cell injury and Apoptosis, Toxicity Testing approaches, Environmental specimen banking

UNIT – IV

Public Health Programmes– Urban and rural health, Sanitation, Case studies with special reference to particular disease-Malarial Control Measure, AIDS, Polio, Chikungunya, Dengue, Cancer, Bacterial, viral and fungal diseases for plants

REFERENCES

1. Leslie Collier, Balows Albert and Sussman Max, Topley and Wilson's Microbiology and Microbial infections. Oxford University Press
2. Microbiology, Pelczar MJ Jr, Chan ECS, Krieg NR
3. Introduction to Soil Microbiology, Alexander, M., 1977, 2nd Edn., Wiley John
4. Introduction to Environmental Toxicology: Impacts of chemicals upon Ecological systems. Landis, Wayne and Hing-ho Yu, Boca Raton, (1995) Lewis Publishers.
5. Environmental Toxicology and Chemistry. Crosby, Donald. G. (1998) Oxford University Press.
6. Ecotoxicology, Schuurmann, G. and Market, G. (1998) A. John Wiley & Sons, Inc.
7. Information Resources in Toxicology: Wexler, Philip et al, (2000) 3rd Ed. Academic press
8. Environmental Biology & Toxicology. Sharma P.D. (1994). Rastogy publications
9. Biotechnology from A to Z 1993. William Bains, IRL Press, Oxford, England PP 358.

ENV204 - OCCUPATIONAL HEALTH AND INDUSTRIAL SAFETY

UNIT-I

Occupation health: Definition and scope. Overview of work place health hazards. Physical, chemical, biological and radiological health hazards. silicosis, asbestosis, pneumoconiosis, siderosis, Byssinosis. Ways to reduce occupational risks.

UNIT-II

Industrial hygiene: Definition, Environmental factors and their effects on Workers health. Hazards at work places. Benefits and goals of industrial hygiene program. Medical facilities in factories, Ventilation and heat stress, Significance of ventilation, Purpose of lighting, Uses of good illumination.

UNIT-III

Personal Protective Equipments (PPEs), Types of PPEs their use care and maintenance. Different air pollutants in Industries, Effect of different gases and particulate matter, acid fumes, smoke, fog on human health.

UNIT-IV

Industrial safety: Importance of Industrial safety, role of safety department, Safety committee and Function principles of safety management, fire prevention, accident prevention, handling of dangerous substances. First aid : Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, bleeding, Burns, and accidents caused by electricity, Safety activities of the ILO (International Labour Organization) Introduction to OSHAS 18001 and OSHA

REFERENCES:

- 1.Risk assessment- A Practical Guide, 1993, Institution of Occupational Safety and Health, United Kingdom
- 2.Industrial safety management By: L.M. Deshmukh Publishers: Tata Megraw Hill ,New Delhi Year: 2006 Edition: First
3. Industrial safety health and environment Management system By: R.K. Jain & Sunil S. Rao Publishers: Khanna Publishers Year: 2008 Edition: Second
- 4.R.K.Jain and Sunil S.Rao , Industrial Safety , Health and Environment Management Systems, Khanna publishers , New Delhi (2006)
5. Slote.L,Handbook of Occupational Safety and Health, John Willey and Sons, NewYork .

**ELECTIVE –I SYLLABUS
SEMESTER -II
ENV-207**

BASICS IN ENVIRONMENTAL SCIENCE

Unit –I

Ecosystem: Concept, Structure, functions, food chain, food web, Ecological pyramids, Energy flow in ecosystem, **Forest ecosystem**, grassland, desert and Aquatic (ponds, rivers, estuaries).

Unit – II

Environment: **Importance of environmental studies**, Natural resources, Forest, Water, Mineral, energy, land, Acid Rain, **Ozone depletion**, Urbanization, Eutrophication,

Unit –III

Biodiversity and its conservation, Biogeographical classification of India, India as a megadiversity nation, value of biodiversity, Hotspots of biodiversity, Threats to biodiversity, Habitat loss, man –animal conflicts, **endangered and endemic species of India**.

Unit IV

Air pollution, water pollution, soil pollution, marine pollution, noise pollution, **radioactive pollution**, thermal pollution.

REFERENCES:

1. Fundamental and Environmental Ecology, III Edition, Odum, E. P., (1971) Prentice Hall.
2. Living in the Environment – Principles, Connections and Solutions, Tyler Miller Jr. G., (1996) Wadsworth Publishing Co., New York.
3. Ecology and Environment, Sharma P. D., (1994) Rastogi Publications, Meerut.
4. Environmental Science, Daniel D Chiras., (1994) The Benjamin/Cummings Publishing Co. Inc.
5. Environmental Pollution Control Engineering, C. S. Rao, (2006) New age International Publishers.

ENVIRONMENTAL ENGINEERING

UNIT – I

Design of Pressure Pipes, Pump types, Characteristic curves, General layout of Water Treatment Plant – Aerators – Types, Flash Mixer – Design – Clari–flocculator– Filtration – Rapid sand filter and Pressure sand filter design – chlorine demand, residual chlorine and chlorine dosage, **Role of Ozone and UV as a Disinfectant.**

UNIT – II

Primary and Secondary Settling Tanks – Activated Sludge Process – Types and modifications – Design of Aeration Tanks and Oxidation Ditch – Diffusers and Mechanical Aerators, Tricking Filters and their Design. **Duncan Mara Systems (Waste Stabilization Ponds).**

UNIT – III

Sludge Processing and Disposal Methods – Design of Anaerobic Digester and Sludge Drying Bed – **Reverse Osmosis** – Ion Exchange – Incinerators, Land filling – Composting, Vermicomposting, Fly ash utilization, Case studies: Dyeing, Paper and Pulp, Distillery, Thermal, Tannery.

UNIT – IV

Air Pollution Control - **Minimum Stack Height** – Plume Rise, Design of Settling Chamber, **Cyclones**, Fabric filters and Electrostatic Precipitators. Scrubber, Exhaust.

REFERENCES:

1. Introduction to Environmental Engineering and Science. Gilbert M. Masters (2004). Prentice – Hall of India Pvt. Ltd., New Delhi.
2. Wastewater Treatment. Rao M. N. and Datta, A. K (1987). Oxford & IBH Publishing Company Pvt. Ltd., New Delhi.
3. Environmental Engineering. Mackenzie L. Davis and David A. Cornwell (1991). Mc Graw Hill International Editions, New York.
4. Water and Wastewater Technology. Hammer M. J and Hammer Jr. M. J (2001). Prentice – Hall of India Pvt. Ltd., New Delhi.
5. Wastewater Engineering: Treatment and Reuse. Metcalf and Eddy (2003). Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
6. Sewage Disposal and Air Pollution Engineering. Garg. S. K (1990) Khanna Publishers, India.
7. Advances in Industrial Wastewater Treatment. Goel P. K and Sharma K. P (1999). Technoscience Publications, Jaipur, India.
8. Chemistry for Environmental Engineering and Science. Sawyer C. N., Mc Carty P. L., and Parkin, G. F (2003) Tata McGraw – Hill Publishing Company Ltd., New Delhi.
9. Environmental Pollution Control Engineering, C. S. Rao, (2006) New age International Publishers.

ELECTIVE –II SYLLABUS
SEME STER–III
ENV-307 CLIMATE CHANGE AND SUSTAINABLE DEVLEOPMENT

Unit –I

Structure and composition of Atmosphere, Montreal protocol, El –Nino Phenomenon, Monsoon in India, urban heat island, **New weather patterns**, water resources, Agriculture.

Unit –II

Green house effect: **Global warming** – major green house gases, sources of green house gases, possible consequences of a green house warming, ozone layer depletion – stratospheric ozone, climate change: effect on organisms and human.

Unit – III

United Nations frame work convention on climate change (UNFCC), **clean development mechanism (CDM)**, Kyoto Protocol, **Intergovernmental panel for climate change (IPCC)**, Overview of Conference of Parties (CoP).

Unit IV

Sustainable development – Concept and key aspects, Sustainable Management of Water Resources, **Food security and GMOS**. Energy and sustainable development, Conservation of non- conventional energy resources – efficient use of energy,.

REFERENCES:

1. J. T. Hardy (2003) Climate change causes, effects and solutions, John Wiley and sons.
2. Tyler Miller Jr. G. (1996) Living in the environment – principles, connections and solutions, Wadsworth Publishing Co. New York.
3. Critchfield, Howard J., 1998. General Climatology, Prentice Hall Pvt. Ltd. New Delhi, India.

ENV 403: Instrumentation and Techniques

UNIT-I

Centrifugation & Separating techniques: General principles of centrifugation, Types of centrifugation, Microcentrifuge, High speed and Ultracentrifuges, Dialysis, Ultrafiltration, Reverse osmosis- Principles of electrophoresis, Agarose electrophoresis, Polyacrylamide gel electrophoresis, SDS-PAGE, 2D PAGE

UNIT-II

Microscopy and Spectroscopic techniques: Principles and applications of light, Phase contrast, Fluorescence, Scanning and Transmission electron microscopy- Titrimetry- Gravimetry- Colourimetry- Beer-Lambert's Law, UV-VIS Spectrophotometry, NMR Spectroscopy, Atomic absorption spectrophotometer (AAS), Flame photometry, X-Ray diffraction, X-Ray fluorescence

UNIT-III

Chromatographic techniques: Chromatographic techniques and types, Paper chromatography, Thin layer chromatography, Gas chromatography, Gas liquid chromatography, Ion exchange chromatography, High performance liquid chromatography

UNIT-IV

Radiochemical and Nanomaterial techniques: Radioactivity- Detection and measurement of radioactivity- Radioactive isotopes-Applications of radioisotopes in biological sciences- Autoradiography- Nanotechnology processes, Nano materials, Nanoengineering materials for pollution prevention, Nanotechnology products

REFERENCES:

- Marr, L.L. and Cresser, M.S. Environmental chemical analysis, International Text Book Company (pub), New York (1983).
- Willard, Merritt, Dean and Settle, Instrumental methods of analysis, CBS Publishers, New Delhi (1986)
- Lenore S. Clesceri, Arnold E. Greenberg, Andrew D. Eaton. Standard methods for the examination of water and waste water, APHA, Washington (1998)
- Keith Wilson and John Walker, Principles and techniques of practical biochemistry, 5th Edition, Cambridge University Press, (2000)
- Gurudeep R Chatwal and Sham K Anand, Instrumental methods of chemical analysis, Himalaya (2005)
- Murugesan and Rajakumari, Environmental science and biotechnology- Theory and Practice, MJP Publishers, New Delhi (2005)
- Keith Wilson, Kenneth H. Goulding, A biologist guide to principles and techniques of practical biochemistry, 3rd ed., ELBS Series. (2006)
- Chatwal and Anand, Instrumental methods of chemical analysis, 5th ed., Himalaya Publications, (2006)
- Douglas. A., Skoog & West, Fundamentals of analytical chemistry, 8th ed., Harcourt Publications, (2006)
- Jo Anne Shatkin, Nanotechnology: Health and Environmental Risk, CRC press, (2008)
- Mao Hong Fan, Chin-Pao Huang, Alan E Bland, Z Honglin Wang, Rachid Sliman, Ian Wright, Environanotechnology, Elsevier, (2010)

BIO-STATISTICS AND RESEARCH METHODOLOGY**UNIT-I**

Fundamentals of Statistics: Collection of data, Classification and Tabulation, diagrammatic representation. **Measures of central tendency**-Mean, Median, Mode, Normal distribution, Skewness, Kurtosis, Measures of Dispersion – Standard deviation, standard error. Statistical hypothesis, **Null hypothesis, level of significance,**

UNIT-II

Statistical analysis: Statistical tests-Z, t, **Chi-square,** Contingency test, One-way analysis of variance, Correlation and Regression. Environmental models-Lotka-volterra model, Guassian air pollution model.

UNIT-III

Scope of research in Environmental Science: Definition of research, Characteristics of research, **Code of research ethics,** Importance of controls and standards, Steps in research process, Selection of research problem, **Objectives, Literature collection.**

UNIT-IV

Research data generation and Grants: Design, planning and execution of investigation, Presentation and interpretation of research data, **Preparation of research articles and review papers for scientific journals,** Research thesis writing, Preparation of research proposal for grants.

REFERENCES:

- Statistical Methods. Gupta S. P (1996) Sultan Chand & Sons Publications. New Delhi.
 Instrumental Methods of Chemical Analysis, Ewing G. W., (1985) 5th Edition McGraw Hill, U. K.
 Fundamentals of Bio-Statistics. Khan I. A and Kanum A (1994) Ukaaz Publication, Hyderabad.
 Business Mathematics and Statistics. Vittal R. R (1986) Murgham Publications.
 Statistics for people who hate statistics. Neil J Salkind (2000) Sage Publications. Inc. New Delhi.
 Introduction to Bio-Statistics. Gurumani (2005) MJP Publications, Chennai.
 Kothari, C. R. (1980). Research Methodology: Research and techniques, New Delhi: New Age International Publishers
 Leedy, P. D. (1980). Practical Research: Planning and design. Washington: Mc Millan Publishing Co., Inc
 Research Methodology-Methods and Techniques. Kothari, C.R., (1989), Wiley Eastern, New Delhi. 16.
 Introduction to Research Methodology in Agricultural and Biological Sciences, V.Venkatasubramanian (1999), New Century Book House (P) Ltd., Chennai
 Wallinman, N. (2006). Your Research Project: A step-by-step guide for the first-time researcher. London: Sage Publications
 Kumar, R. (2011). Research Methodology: a step-by-step guide for beginners (3rd edition). London, UK: TJ International Ltd, Padstow, Cornwall.

APPENDIX – A

M.A.URDU

SEMESTER –I

CORE COURSE – 1

URD - 101: MUBADIYAT-E-LISANIYAT AUR TAREEQ-E-ZABAN-E-URDU

UNIT –I : ZABAN KA MUTALEA

- (a) ZABAN KI MAHIYAT
- (b) ZABAN KI KHISMEIN
- (c) ZABAN AUR BOLI

UNIT –II : MUBADIYAT-E- LISANIYAT

- (a) LISANIYAT KI TAREEF
- (b) LISANIYAT KI IFADIYAT
- (c) LISANIYAT KI SHAKHEIN

UNIT – III: HIND ARYAI KI TEEEN (3) MANZILEIN

- (a) AHAD – E – QADEEM
- (b) AHAD – E – WASTA
- (c) AHAD – E – JADEED

UNIT- IV: JADEED ARYAI ZABANON KA IRTEQA AUR URDU ZABAN
KE AGAZ KE NAZRIYAT

REFERENCE BOOKS:

1. AAM LISANIYAT – Prof. GYANCHAND JAIN
2. LISANI MUTALIYE - Prof. GYANCHAND JAIN
3. PUNJAB MEIN URDU – HAFIZ MAH MOOD KHAN
SHEERNI
4. AAB – E – HAYAT – MOHD HUSSAIN AZAD
5. MUQADDAMA – E – ZABAN –E- URDU –
Prof. MASOOD HUSSAIN
KHAN
6. DASTAN –E- ZABAN –E- URDU –
Dr. SHOUKAT SABZWARI

A

URD - 103 : FANN-E-SHER AUR JADEED ASNAF -E- SHAIRI

UNIT-I : ILM- E- BAYAN AUR ALAMAT NIGARI

- 1) TASHBIH AUR USKI KHISMEIN
 - (a) TASHBIH KHAREEB
 - (b) TASHBIH BAEED
 - (c) **TASHBIB -UL - IZARATH**
- 2) ISTEARA AUR USKI KHISMEIN
 - (a) ISTEARA BIT TASREEH
 - (b) ISTEARA TABAEYA
- 3) **MAJAZ - E - MURSAL**
- 4) KINAYA AUR USKI KHISMEIN
 - (a) KINAYA KHAREEB
 - (b) KINAYA BAEED
 - (c) **TALMEEH**
 - (d) TAREEZ

UNIT - II: SANAYE -O- BADAYE

- (a) TEHTUN NUKHAT
- (b) **FAUQUN NUKHAT**
- (c) SANAT - E - WASU - USH - SHAFATAIN
- (d) SANAT - E - WASILUSH SHAFATAIN
- (e) SANAT - E - ISHTEQAQ
- (f) SANAT - E - SHUBA -E- ISHTEQAQ
- (a) **SANAT - E - EEHAM**
- (b) SANAT - E - MIRATUN NAZEER
- (c) SANAT - E - HUSN -E- TALEEL
- (d) **SANAT - E - TAZAD**
- (e) SANAT - E - LAF -O- NASHR
- (f) SANAT - E - MUBALIGHA

URD-202 : CLASSIKI SHAIRI

UNIT – I : **MASNAVI KA FANN AUR SEHARUL BAYAN
BY MIR HASAN**

UNIT– II : MARSIIYE KA FANN AUR ANEES KI MARSIIYA NIGARI

UNIT–III : MIR KI GHAZAL GOYI

UNIT–IV : **GHALIB KI GHAZAL GOYI**

REFERENCE BOOKS;

1. URDU MASNAVI KA IRTEQA BY ABDUL KHADER SARVARI.
2. ANEES KE MARSIIYE BY SALEHA ABID HUSSAIN.
3. INTEQABE KALAAME MIR BY MAULVI ABDUL HAQ
4. DEEWANE GHALIB MA SHARA BY YUSUF SALEEM CHISHTI.

URD-203 : CLASSIKI NASR

UNIT – I : URDU DASTAN : AGAAZ –O- IRTIQA

UNIT – II : **BAGH –O- BAHAR BY MIR AMMAN**

UNIT – III: FASANA –E- AJAYEB BY RAJAB ALI BAIG SUROOR

UNIT – IV: **ADABI QUTOOT –E- GHALIB BY MIRZA ASKARI**

REFERENCE BOOKS:

1. DASTAN SE AFSANE TAK - VIQAR AZEEM
2. URDU DAASTAN : TEHQEEQ –O- TANQEED- QAMAR –UL-HUDA

URD 204 : TAREEK-E-ADBE URDU

UNIT- I : SHUMALI HIND MEIN URDU SHAIRI KA
IBTEDAI DAUR

UNIT- II: URDU NASR KA IRTEQA UNNESWEEN SADI TAK.

UNIT-III : DABISTAN-E- DELHI AUR DABISTAN-E- LUCKNOW

UNIT-IV : BEESWEEN SADI MEIN URDU ADAB

URD- 205 : GHAIR AFSANAVI ADAB

UNIT – I : MAKTOOB NIGARI : TAREEF, AGHAZ –O- IRTIQA
MAKTOOBAT – E- RASHEED.

UNIT – II : INSHAIYA : TAREEF, AGHAZ -O- IRTIQA
(1) JHINGER KA JANAZA – KHWAJA HASAN NIZAMI
(2) AAINE MEIN – YOUSUF NAZIM

UNIT – III : KHAKA : TAREEF, AGHAZ -O- IRTIQA
(1) NAZEER AHMED KI KAHANI – FARHATULLAH
BAIG
(2) GUDADI KA LAL – MAULVI ABDUL HAQ

UNIT – IV : SAFARNAMA : TAREEF, AGHAZ -O- IRTIQA
CHALTE HO TO CHEEN KO CHALIYE – IBN –E- INSHA

REFERENCE BOOKS:

1. INSHAIYA AUR INSHAIYE BY SYED MOHD HUSMAIN
2. INSHAIYE KE KHAD-O-KHAL BYWAZEER AGHA
3. URDU ADAB MEIN KHAKA NIGARI BY SABIRA SAYEED

NON CORE

206: COMPUTER APPLICATIONS

UNIT : 1

- a) Exploring computers and their uses
- b) Types of storage Devices
- c) Operating System Basics

UNIT: II MS – Word

- a) Word Basics
- b) Header and Footer
- c) Tables
- d) Graphics
- e) Macros
- f) Mail Merge

UNIT: III MS –Excel

- a) Excel Basics
- b) Formatting
- c) Introduction to Functions
- d) Excel Charts

UNIT: IV MS – Power Point

- a) Power point Basics

APPENDIX – B

SEMESTER –III

URD 301 : JADEED NASR

UNIT - I : JADEED NASR KA AGHAZ O IRTIQA

UNIT- II : IFADAT-E- MEHDI BY NAZAMEEN

FIRST 3 SELECTED ONLY

UNIT –III : UMRA –O- JAN ADA – MIRZA RUSWA

UNIT - IV : GHUBAR –E- QATIR : MAULANA ABUL KALAM AZAD

SELECTED ANY FIVE ONLY.

URD 302 : JADEED NAZM

UNIT – I : MAGHDOOM MOHIDDIN – NAZMEIN

- (1) SUBH-E-AZADI
- (2) SIPAHI

UNIT –II : NOON MEEM RASHID – NAZMEIN

- (1) KHUD KHUSHI
- (2) RAQS

UNIT – III: SAHIR LUDHIYANAVI - NAZMEIN

- (1) TAJ MAHAL
- (2) AYE SHAREEF INSANO

UNIT – IV : AKHTAR –UL- EEMAN - NAZMEIN

- (1) EK LADKA
- (2) AGAHI

REFERENCE BOOKS:

1. NAYI NAZM KA SAFAR – Edited by KHALEEL –UR – REHMAN AZMI.
2. NAZM –E- JADEED KI KARWATEIN – Dr. WAZEER AGHA
3. KULIYATE SAHIR – SAHIR LUDHIYANAVI

URD 303 : URDU TANQEED

UNIT – I : **TANQEED** : MAHIYAT – IFADIAT AUR AHMIYAT

UNIT – II : HALI AUR SHIBLI KE TANQEEDI NAZRIYAT

UNIT – III: **TASURATI TANQEED AUR NAFSIYATI TANQEED**

UNIT – IV : **MARXI TANQEED AUR SCIENTIFIC TANQEED**

REFERENCE BOOKS:

1. URDU TANQEED KI TAREEQ – MASOOD HUSSAIN
2. ADABI TANQEED – Dr. MOHD. HASAN
3. FANN –E- TANQEED AUR URDU TANQEED NIGARI – NOORUL HASAN NAQVI
4. URDU TANQEED HALI SE KALEEM TAK – Dr. IRTEZA KAREEM

URD 304 : URDU AFSANA

UNIT - I : AFSANA : FANN AUR TECHNIQUE

UNIT – II : URDU AFSANA : AAGAZ –O- IRTIQA

UNIT – III: PREMCHAND KA AHAD

- (1) SAJJAD HYDER ELDARAM
- (2) **ALI ABBAS HUSSAINI**

UNIT- IV: TARAQQI PASAND AUR JADEED AFSANA

- (1) KRISHAN CHANDR – MAHA LAKSHMI KA PUL
- (2) MANTO – MAMMAD BHAI
- (3) ISMAT CHUGTAYI – CHOWTHI KA JODA
- (4) RAJENDRA SINGH BEDI – BHOLA
- (5) NAZARA DARMIYAN HAI BY QURATTUL AIN HYDER
- (6) **AAKHRI AADMI BY INTIZAR HUSSAIN**

REFERENCE BOOKS:

1. NAYA AFSANA – VIQAR AZEEM
2. URDU AFSANA RIWAYAT AUR MASAIL – Prof. GOPI CHAND NARANG
3. MUKHTASAR AFSANE KA FANNI TAJZIYA – Dr. FIRDOSE FATIMA

URD 305 ELETIVE –I

SIR SYED KA KHUSOOSI MUTALEA

UNIT I : SIR SYED: HAYAT AUR SHAKSIYAT

UNIT – II : SIR SYED KI ADABI KHIDMAT

UNIT – III: SIR SYED KI TALEEMI KHIIDMAT

UNIT – IV : SIR SYED KE RUFQA

REFERENCE BOOKS:

1. HAYAT –E- JAWEED – HALI
2. SIR SYED AUR ALIGARH TEHREEK – KHALIQ AHMED NIZAMI
3. SIR SYED AUR UNKE NAMVAR RUFQA – SYED ABDULLA.

URD 305 ELECTIVE –II

IQBAL KA KHUSOOSI MUTALEA

UNIT - I : IQBAL : HAYAT AUR SHAKHSIYAT

UNIT – II: **IQBAL KA SAFAR – E- EUROPE**

UNIT – III : BAL –E- JIBRAIL KI IBTEDAYI PANCH GHAZ LEIN

UNIT – IV: BAL –E- JIBRAIL KI NAZMEIN

- (1) **ZAUQ – O- SHAUQ**
- (2) **MASJID – E- QARTABA**
- (3) SAQINAMA

NON – CORE
COMPUTER APPLICATIONS

U NIT: I

- a) **Telecommunications and Networks**
- b) The Internet, Internets and Extranets

UNIT: II

- a) **Internet communication protocols**
- b) Types of Internet connections

UNIT: III

- a) **Web Browsers**

UNIT: IV

- a) **Email Concepts**

IV – SEMESTER

URD 401 : URDU DRAMA

UNIT - I : **DRAMA : FANN AUR TECHNIQUE.**

UNIT – II : DRAME KI AQSAAM URDU ME DRAME KI RIWAYAT

UNIT – III : **ANARKALI – IMTIYAZ ALI TAJ**

UNIT – IV: **AGRA BAZAR BY HABEEB TANVEER**

REFERENCE BOOKS:

1. URDU DRAME KI TANQEED –O-TAREEQ – ISHRAT REHMANI
2. DRAMA NIGARI KA FANN – Dr. MOHD ASLAM QURESHI
3. URDU DRAME KA IRTIQA – ISHRAT REHMANI

URD 402 : ADABI TEHREEKAT AUR RUJHANAT

UNIT – I : ALIGARH TEHREEK

UNIT – II: **ROOMANI TEHREEK**

UNIT – III: TARAQQI PASAND TEHREEK

UNIT – IV: JADEEDIAT

BOOKS RECOMMENDED:

1. ALIGARH TEHREEK ; SAMAJI AUR SIYASI MUTALEA- MAZHAR
HUSSAIN
2. URDU MEIN TARAQQI PASAND ADABI TEHREEK - KHALEEL-UR-REHMAN
AZAMI
3. JADEEDIAT KI FALSAFIANA ASAS – Dr. SHAMEEM HANAFI
4. JADEEDIAT AUR MA BAAD JADEE DIAT – Prof. GOPI CHAND NARANG
5. .ADABI TEHREEKAT AUR RUJHANAT – ANWAR PASHA

URD 403 : TANZ – O – MIZAH

UNIT - I : TANZ –O- MIZAH : FANN AUR RIWAYAT

UNIT – II : **AKBAR ILLAHABADI**

UNIT – III : RASHEED AHMED SIDDIQUI

(1) ARHAR KA KHET

(2) **CHAR PAYI**

UNIT – IV : MUSHTAQ AHMED YOUSUFI

(1) PADIYE GAR BEEMAR

(2) **CRICKET**

REFERENCE BOOKS:

1. URDU ADAB MEIN TAN –O- MIZAH – WAZEER AGHA
2. TANZIYAT –O- MAZHAKAT – RASHEED AHMED SIDDIQU.

URD 404 : URDU TARSEEL –O-IBLAGH KE ZARAYE

UNIT – I : URDU SAHAFAT-AGAZ-O-IRTIQA

UNIT – II : RADIO

(a) **RADIYAI TEHREER** : : MAHIYAT, IFADIYAT
AUR AHMIYAT

(b) **RADIYAI DRAME KA FANN**

(c) **RADIO AUR URDU**

UNIT – III : TELEVISION

(a) SCRIPT NAVEESI

(b) **URDU AUR TELEVISION**

UNIT – IV : URDU AUR INTERNET

(a) **INTERNET**

(b) URDU KE WEBSITE.

REFERENCE BOOKS:

1. URDU SAHAFAT KI TAREEQ – IMDAD SABRI
2. IDARIY NAVEESI – MISKEEN ALI HIJA ZI
3. URDU AUR AWAMI ZARAYE IBLAGH – (EDI) MOHD SHAHID
HUSSAIN & IZHAR USMAN.
4. IBLAGHIYAT- Dr. MOHD. SHAHID HUSSAIN

URD 405 ELECTIVE- I
TEHQEEQ KA FANN

UNIT - I : TEHQEEQ AUR TEHQEEQ KAAR

- (a) TEHQEEQ KYA HAI
- (b) TEHQEEQ –O- TANQEED KA TALUQ

UNIT – II : TEHQEEQI MAQALA

- (a) MAQALE KI QISMEIN
- (b) MAQALE KI TAREEF
- (c) MAQALE KE AJZA

UNIT – III : MAUZU AUR KHAKA

- (a) KAISA MAUZU MUNASIB HAI
- (b) MAUZU KAISA NA HONA CHAHIYE
- (c) FARD PAR TEHQEEQ KE KHAKHE
- (d) ASNAFE ADAB KE KHAKHE

UNIT – IV : MAWAD KI FARAHAMI

- (a) URDU KITA BEIN
- (b) RASAEEL
- (c) MAKHTUTAT

REFERENCE BOOKS ;

1. TEHQEEQ KA FANN- GYAN CHAND JAIN

URD 405-ELECTIVE-II

URDU TARJUME KA FANN

UNIT – I : TARJUMA NIGARI - FANN AUR USKI AKHSAAM

UNIT – II : TARJUMA NIGARI - USOOL AUR MASAIL

UNIT - III : URDU MEIN TARJUME KI RIWAYAT AUR AHMIYAT

UNIT – IV: URDU MEIN ADABI TARAJIM

REFERENCE BOOKS:

1. TARJUME KA FANN AUR RIWAYAT EDITED BY PROF. QAMAR RAYEES
2. FANNE TARJUMA NIGARI EDITED BY DR. KHALEEQ ANJUM
3. USOOLE WAZE ISTILAHAAT BY WAHEEDUDDIN SALEEM.

The following courses introduced in M.Sc., Mathematics programme have relevance to promotion of employability in industry, Medical research Agriculture, Insurance, Marketing, Computer Science and other branches of Engineering .

1. Business Mathematics (Non-Core)
2. Operations Research
3. Coding Theory
4. Graph Theory
5. Number Theory
6. Fluid Dynamics
7. Semigroups

T. Vasanthi
HEAD
Department of
Applied Mathematics
YOGI VEMANA UNIVERSITY
KADAPA - 516 003



YOGI VEMANA UNIVERSITY

Department of Botany

Vemanapuram, Kadapa- 516005 Andhra Pradesh, India

Dr. A. Madhusudhana Reddy
Head Department of Botany

Mobile: 994-977-9166
Email: grassced@yahoo.com

Activities of Department on promoting employability/Entrepreneurship/Skill development

The course Plant Tissue Culture introduced in M.Sc., Botany programme has direct relevance to promotion of employability in industrial sector and Agriculture. Department invited persons from industry who have rich expertise and arranged talks in various aspects in Plant Tissue Culture. Plant tissue culture has a lot of applications in crop improvement like making successful distant crosses, shortening breeding cycles, somaclonal variants, germplasm exchange etc.,

HEAD
Department of Botany
YOGI VEMANA UNIVERSITY
KADAPA - 516 005.

Saleem/ Subhosh Sir



YOGI VEMANA UNIVERSITY

(If Know thyself, Thou Art the Divinity)

Department of Biotechnology & Bioinformatics

Vemanapuram, Kadapa, AP-516005

Dr. K. Riazunnisa
HEAD

Phone: 9966863416, Fax. 08562-225419
E-mail: khateefriaz@gmail.com

Activities of Department on promoting employability/Entrepreneurship/Skill development

The Course/Papers "Principles of Management & Entrepreneurship and Bioethics, Biosafety and IPR" introduced in 5 Years Integrated M.Sc. Biotechnology and Bioinformatics programme has direct relevance to promotion of employability in industrial sector. Department invited persons from University/institute/industry who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.

HEAD
Head
Dept., of Biotechnology & Bioinformatics
Yogi Vemana University,
Vemanapuram, Kadapa-516 005, (A.P.) India.



DEPARTMENT OF BUSINESS MANAGEMENT
YOGI VEMANA UNIVERSITY :: KADAPA

Dr.S.Venkata Subba Reddy Ph.D
Asst.Professor & Coordinator

C : +91-9848393469
e-mail : svreddyseelam@gmail.com

Activities of Department for Promoting Employability/Entrepreneurship/Skill Development

The Course/papers entitled, “Entrepreneurship and Small business Development, Logistics and Supply Chain Management, Taxation Management and Advertising and Sales Promotion” introduced in MBA programme had direct relevance to promotion of employability in industrial sector and also the Department has invited persons from various Universities/Institutes/industries, who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.


COORDINATOR
Co-ordinator
DEPARTMENT OF BUSINESS MANAGEMENT
YOGI VEMANA UNIVERSITY
KADAPA - 516 003



YOGI VEMANA UNIVERSITY

Vemanapuram, Kadapa – 516 005, Andhra Pradesh, INDIA

COORDINATOR

Coordinator & Assistant Professor
Department of Chemistry

(Tel): 91-(8562)-225410

(Mobile): 91-9966927978

e-mail: sarma7@yogivemanauniversity.ac.in

27th August 2021.

To

The Director
IQAC
Yogi Vemana University
KADAPA – 516 005.

Sir,

Sub: Dept of Chemistry – M. Sc (Chemistry) – Course focusing on employability/ entrepreneurship/skill development – activities of the department - Regarding.

Department of Chemistry is running a two year M. Sc (Chemistry) programme. The course “*Synthetic Strategies and Drug Design (CHEM – 45032)*” introduced in M. Sc Chemistry has direct relevance to promotion of employability in industrial sector. Department invited persons from industry/scientific organizations who have rich expertise and arranged lectures on various aspects of organic synthesis and drug design. The following persons during the years **2015 – 2021** visited the department and delivered lectures.

- 1) Prof. N. Chandrakumar, Dept. of Chemistry, IIT Chennai, Chennai (17-10-2015).
- 2) Dr. K. Mallikarjuna Reddy, Himalaya Drug Company, Bengaluru (20-02-2016).
- 3) Dr. G. Rajkumar, ARON Universal Pvt. Ltd., Bengaluru (11-04-2016).
- 4) Dr. A. Somasekhar Reddy, Perrigo Pharmaceuticals, Michigan, USA (01-09-2016).
- 5) Dr. K. Gopalaiah, Dept. of Chemistry, University of Delhi, Delhi (11-07-2017).
- 6) Dr. A. V. R. Reddy, BARC, Mumbai (21-03-2018).
- 7) Prof. M. Periaswamy, University of Hyderabad (25-01-2019).
- 8) Dr. Ekambaram Balarman, IISER, Tirupati (24-02-2021).
- 9) Dr. K. Narayana Swamy, ICGM – University of Montpellier, France (09-08-2021).

Thanking you

Yours sincerely


COORDINATOR 27.8.21



YOGI VEMANA UNIVERSITY

Vemanapuram, Kadapa, Andhra Pradesh-516005.
www.yogivemanauniv.com

Dr.G.Haranath., *M.Com, MBA,PhD.*,
Assistant Professor, Co-ordinataor, Department of Commerce.

Date: 04-03-2021

Activities of Department on Promoting Employability/Entrepreneurship/Skill

Development

The course/papers “**Corporate Financial Accounting, E-Commerce, Corporate Tax and GST, Soft Skills for Career Development, Entrepreneurship Development, Banking and Insurance Services**” introduced in M. Com (Commerce) has direct relevance to promotion of employability in industrial sector. Department invited eminent persons from University/Institute/Industry who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.


Co-ordinator

Dr.K.Srinivasa Rao B.Tech, M.Tech, Ph.D.
Coordinator



Department of Computer Science & Technology
Yogi Vemana University
Kadapa-516 005
Phone No: 09618712660 (Mobile)
E-mail: kanususrinivas@yahoo.co.in

Activates of Department of Computer Science and Technology on promoting employability/
Entrepreneurship/Skill development

The course/paper “Clouding Computing , Artificial Intelligence“ introduced in Department of Computer Science and Technology has directed relevance to promotion of employability in IT sector. Department invited persons from University/Institute/IT industry who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.

Thank you sir

Yours faithfully

Coordinator
Dept. of Computer Science & Technology
Yogi Vemana University
Kadapa - 516 005



YOGI VEMANA UNIVERSITY
Department of English
KADAPA – 516 005, ANDHRA PRADESH, INDIA

Dr. Jillella Mercy Vijetha
Associate Professor & Chairperson, BOS
Department of English

Activities of Department on promoting employability/Entrepreneurship/Skill development

The Course/Paper **Communicative English** was introduced in the M.A. English programme. The subject/paper is prescribed to acquire knowledge of "communication skills" to develop social and professional new challenges in a contemporary globalised world. The Department has invited people from universities and institutes who have rich expertise. Experts' talks on the perspectives of the subject are arranged.

Chairperson, BOS
CHAIRPERSON
BOARD OF STUDIES
DEPARTMENT OF ENGLISH
Yogi Vemana University,
KADAPA - 516 005, A.P.

YOGI VEMANA UNIVERSITY: KADAPA

Dr. L. VEERANJANEYA REDDY
Head & BOS Chairman
Department of Microbiology



Mobile: 91-9182522772
E-mail: lvereddy@yahoo.com

Activities of Department on promoting employability/Entrepreneurship/skill development

The course “**Microbial Technology and Entrepreneurship**” introduced in M.Sc Microbiology programme has direct relevance to promotion of employability in industrial sector & to start once Entrepreneurship. Department invited persons from industry who have rich expertise and arranged talks in various aspects of industrial products and fermentation techniques.

L. V. Reddy

HEAD
Department of Micro Biology
YOGI VEMANA UNIVERSITY
KADAPA.

YOGI VEMANA UNIVERSITY :: KADAPA

Minutes of the meeting Board of Studies (PG) for Dept of Genetics and Genomics, conducted in the co-ordinator office, Department of Genetics and Genomics, Yogi Vemana University College, Kadapa at 3PM on 15th April, 2015.

External Members:

1. Prof. Chinta Sudhakar, Dept of Biotechnology, S.K.University, Anantapur
2. Prof. O.V.S. Reddy, Dept of Biochemistry, S.V.University, Tirupati

Internal Members:

3. Dr. P. Chandramathi Shankar, Assoc. Prof., Dept of Biotechnology – Chairperson & Convener
4. Dr. A. Muni Kumari, Asst. Prof., Dept of Genetics and Genomics - Member
5. Dr. L. Dakshayani, Asst. Prof., Dept of Genetics and Genomics - Member
6. Dr. E.C.Surendranatha Reddy, Asst. Prof., Dept of Genetics and Genomics- Member
7. Dr. B. Remesh, Asst. Prof., Dept of Genetics and Genomics- Member
8. Dr. P. Osman Basha, Asst. Prof., Dept of Genetics and Genomics- Member

SUBJECT:

1. Introducing Choice Based Credit System with one Open Elective in II and III semesters.
Open Elective in II semester: Basics in Genetics
Open Elective in III semester: Inherited genetic diseases in Humans
2. Including Project in IV semester in place of two practical and one theory paper with modifications of existing syllabus.

RESOLVED:

All the members unanimously resolved to continue the existing Syllabus with the above necessary modifications and to continue the existing pattern of examinations for all the Semesters i.e., I,II, III and IV of M.Sc., Genetics and Genomics for the Academic years 2015-16 onwards.

SIGNATURE OF THE MEMBERS:

External Members:

1. Prof. Chinta Sudhakar,
2. Prof. O.V.S. Reddy

Internal Members:

1. Dr. P. Chandramathi Shankar
2. Dr. A. Muni Kumari
3. Dr. L. Dakshayani
4. Dr. E.C.Surendranatha Reddy
5. Dr. B. Remesh
6. Dr. P. Osman Basha

Chinta Sudhakar
O.V.S. Reddy
- *P. Chandramathi*
- *A. Muni Kumari*
- STUDY LEAVE
- *E.C. Surendranatha Reddy*
- *B. Remesh*
- *P. Osman Basha*

P. Chandramathi
CHAIR PERSON
Board of Studies (Combined)
Biotech, Biotech & Bioinformatics
Genetics & Genomics
YOGI VEMANA UNIVERSITY



YOGI VEMANA UNIVERSITY
Department of Materials Science & Nanotechnology
Vemanapuram, Kadapa – 516 005

Dr.M.V.Shankar,FRSC
Professor &Head

shankarnano@yvu.edu.in
headnanotechnology@yogivemanauniversity.ac.in

Activities of Department on promoting employability/Entrepreneurship/Skill development

The Course/Papers "**Alloys and Paints, Nanocatalysis and its Applications, Energy Conversion Technologies**" introduced in M.Sc. Materials science & Nanotechnology program has direct relevance to promotion of employability in industrial sector. Department invited persons from University/institute/industry who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.

Head

Professor & Head
Dept. of Materials Science & Nanotechnology
YOGI VEMANA UNIVERSITY
KADAPA-516005



YOGI VEMANA UNIVERSITY
Department of Materials Science & Nanotechnology
Vemanapuram, Kadapa – 516 005

Dr.M.V.Shankar,FRSC
Professor &Head

shankarnano@yvu.edu.in
headnanotechnology@yogivemanauniversity.ac.in

Activities of Department on promoting employability/Entrepreneurship/Skill development

The Course/Papers "**Alloys and Paints, Nanocatalysis and its Applications, Energy Conversion Technologies**" introduced in M.Sc. Materials science & Nanotechnology program has direct relevance to promotion of employability in industrial sector. Department invited persons from University/institute/industry who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.

Head
Professor & Head
Dept. of Materials Science & Nanotechnology
YOGI VEMANA UNIVERSITY
KADAPA-516005



YOGI VEMANA UNIVERSITY

Vemanapuram, Kadapa - 516005, A.P.

Prof. Y. NAZEER AHAMMED
Chairman
Board of Studies in Physics

Phone: 9491944454
E-mail: ynahammed@gmail.com

Date: 08-01-2021

To

The Director
IQAC Cell
Yogi Vemana University,
Kadapa-516005

Sir,

Sub: Department of Physics – Board of Studies in Physics – Activities of the Department on promoting employability/Entrepreneurship/Skill development in the M.Sc. Physics graduates - Information – Regarding.

This is to inform you that the course on “Advanced Analytical Instrumentation” introduced in M.Sc. Physics programme has direct relevance in promoting employability in industrial sector. Department of Physics invited persons from industry/research laboratories/institutions, who have rich expertise and arranged talks/hands on experience in various aspects of analytical instruments to the students of M.Sc. Physics:

- 1) UV-Vis-NIR Spectrophotometer
- 2) X-RD Spectrometer
- 3) ICP-Atomic Emission Spectrometer
- 4) ICP-Mass Spectrometer
- 5) Scanning Electron Microscope
- 6) Travelling Electron Microscope
- 7) Fluorescence Microscopy etc.,

Thanking you,

Yours sincerely,

(Y. NAZEER AHAMMED)
CHAIRMAN, BOS IN PHYSICS

Copy to

1. The Head, Department of Physics, YV University, Kadapa for information.
2. The Coordinator, Academic Section, YV University, Kadapa for information.
3. The File.



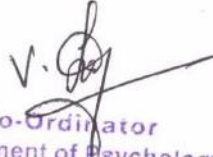
YOGI VEMANA UNIVERSITY

Dr. V.LAZAR
(Coordinator)
Assistant Professor
Dept. of Psychology
Kadapa, 516003, AP, India

Office Tel: 08562-225481/8919345442
E-mail: lazi123@rediffmail.com

Activities of department on promotion Employability/ Entrepreneurship/Skill Development

The course/ Papers: "Clinical Psychology, Counselling Psychology" introduced in 2 years M.Sc Psychology course has direct relevance to promotion of employability in Corporate sector, Hospitals, Educational Institutions and Industries. Department invited persons from university/institutes/ industries who have rich expertise and arranged talks in a various aspects of patents, entrepreneurship.


Co-Ordinator
Department of Psychology
Yogi Vemana University
KADAPA-516 003.



DEPARTMENT OF BUSINESS MANAGEMENT
YOGI VEMANA UNIVERSITY :: KADAPA

Dr.S.Venkata Subba Reddy ^{PH.D}
Asst.Professor & Coordinator

C : +91-9848393469
e-mail : svreddyseelam@gmail.com

Activities of Department for Promoting Employability/Entrepreneurship/Skill Development

The Course/papers entitled, “**Entrepreneurship and Small business Development, Logistics and Supply Chain Management, Taxation Management and Advertising and Sales Promotion**” introduced in MBA programme had direct relevance to promotion of employability in industrial sector and also the Department has invited persons from various Universities/Institutes/industries, who have rich expertise and arranged talks in various aspects of patents, entrepreneurship.


COORDINATOR
Co-ordinator

DEPARTMENT OF BUSINESS MANAGEMENT
YOGI VEMANA UNIVERSITY
K A D A P A - 516 003


21/10/2021

YOGI VEMANA UNIVERSITY:: KADAPA
Department of Biochemistry

Activities of the department on promoting employability/entrepreneurship/ skill development

The courses entitled Clinical Biochemistry (BCH-19), Immunology (BCH-20) introduced in M. Sc. Biochemistry programme and has direct relevance to the promotion of employability in Clinical Laboratories and Pharmaceutical Industries. The department invited persons from University/Institutes/Industry who have rich expertise and arranged talks in various aspects of patents and entrepreneurship.


Chairman, Board of Studies

Department of Biochemistry