MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

VELLORE-632 002

SYLLABUS FOR THE NEW COURSES

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

MASTER OF SCIENCE

DEGREE COURSE

M.Sc. ZOOLOGY

UNDER CBCS

(with effect from 2017-2018)

The Course of Study and the Scheme of Examinations

S. NO	Study Components / Course Title		Ins. hrs/ Week	Credit	Title of the paper	Maximum Marks		
SEMESTER I						**CIA**	**Uni.Exam**	**Marks**
1	MAIN	Paper-1	5	4	Life and diversity of invertebrates	25	75	100
2	MAIN	Paper-2	5	4	Life and diversity of Chordates	25	75	100
3	MAIN	Paper-3	5	4	Cell and molecular Biology	25	75	100
3	MAIN PRACTICAL	Paper 1	12	-	Life and Diversity of Invertebrates Chordates Cell and molecular Biology	-	-	-
4	ELECTIVE (**a**)Disciplinary **or** Elective (**b**)inter Disciplinary	Paper-1	3	3	(A)Aquaculture and Farm Management (B)Biostatistics and Bioinformatics	25	75	100
			30	**15**		**100**	**300**	**400**
SEMESTER II						**CIA**	**Uni.Exam**	**Marks**
5	MAIN	Paper-4	4	4	Genetics	25	75	100
6	MAIN	Paper-5	4	4	Environmental Biology	25	75	100
7	MAIN	Paper-6	4	4	Bio Technology	25	75	100
8	MAIN PRACTICAL	Paper-1	-	5	Life and Diversity of Invertebrates Chordates and Cell and molecular Biology	25	75	100

9	MAIN PRACTICAL	Paper-2	10	5	Genetics, Environmental Biology and Biotechnology	25	75	100
10	ELECTIVE (**a**)Disciplinary **or** Elective (**b**)inter Disciplinary	Paper-2	3	3	(A)Endocrinology (B) Biochemistry	25	75	100
11	Compulsory Paper		2	2	**Human Rights**	25	75	100
12	**Elective** Practical Respective Practical of the Elective Chosen	Paper 1	3	3	(a) Endocrinology or (b)Biochemistry	25	75	100
			30	**30**		**200**	**600**	**800**
SEMESTER III						**CIA**	**Uni. Exam**	**Marks**
13	MAIN	Paper-7	5	4	Animal Physiology	25	75	100
14	MAIN	Paper-8	5	4	Developmental Biology	25	75	100
15	MAIN	Paper-9	5	4	Immunology	25	75	100
16	MAIN PRACTICAL	Paper-3	12	-	Animal Physiology Developmental Biology and Immunology	-	-	
17	ELECTIVE (**a**)Disciplinary **or** Elective(**b**)inter Disciplinary	Paper-3	3	3	(A) Fisheries Science (or) (B) Biophysics	25	75	100
			30	**15**		**100**	**300**	**400**
SEMESTER IV						**CIA**	**Uni.Exam**	**Marks**
19	MAIN	Paper-10	5	5	Research Methodology	25	75	100
20	MAIN	PROJECT (OR)	5	4	Project / Dissertation with Viva Voce	25	75	100
		Paper-11	5	4	Evolution	25	75	100
21	MAIN	Paper-12	5	5	Entomology	25	75	100

					Animal Physiology			

22	MAIN	Practical 3	-	5	Developmental Biology and Immunology	25	75	100
23	MAIN	Practical 4	9	5	Research Methodology Evolution and Entomology	25	75	100
24	Elective (a) Disciplinary **or** Elective(b) inter Disciplinary	Paper 4	3	3	(A) Sericulture (or) (B) Microbiology	25	75	100
25	**Elective** Practical (Respective Practical of the Elective Chosen)	Paper-2	3	3	(a) Sericulture (or) (b)Microbiology	25	75	100
			30	**30**		**200**	**600**	**800**

* **For those not choosing Project / Dissertation with *viva voce,***
Main Paper 11 Evolution is compulsory

Subject	Papers	Credit	Total Credits	Marks	Total marks
MAIN	12	4-5	50	100	1200
MAIN PRACTICAL	4	5-6	20	400	400
ELECTIVE	4	3	12	100	400
ELECTIVE PRACTICAL	2	3	6	100	200
COMPULSORY PAPER	1	2	2	100	100
Total	**23**	**-**	**90**	**-**	**2300**

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

M.Sc. ZOOLOGY

SYLLABUS

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SEMESTER I

PAPER-1
LIFE AND DIVERSITY OF INVERTEBRATES

OBJECTIVES

To comprehend the systematic position, functional morphology, mode of life, affinities and biodiversity of invertebrates.

UNIT-I

Broad classification of the Animal Kingdom – Concepts of species, hierarchial taxonomy.

Protozoa

Feeding, Reproduction and Parasitic adaptations with suitable examples.

Economic importance of Protozoa

Theories on Origin and evolution of Metazoa.

Porifera

Functional morphology of freshwater sponges with suitable examples.

Marine sponges.

Reproduction in sponges.

Skeleton in sponges.

UNIT-II

Coelenterata

Origin and evolution, Polymorphism and Reproduction.

Corals and Coral reeves

Helminthes

Functional morphology and adaptations for parasitic mode of life. Helminthes in human diseases.

UNIT-III

Annelida

Archiannelida. Interelationship between different classes of Annelida. Origin and evolution of coelom. Adaptive radiation in Annelida.

Arthropoda

Xiphosura-structure and affinities. Larval forms in crustaceans. Economic importance of Crustaceans. Phylogeny of Arthropoda,

UNIT-IV

Mollusca

Torsion in Gastropoda - Adaptive radiation in Mollusca. Phylogeny of Mollusca,

Echinodermata

Origin and evolutionary significance of Echinoderm larvae.

UNIT-V

Minor Phyla

Structural peculiarities and affinities of, Nemertinea, Rotifera, Pogonophora, Phoronida.

Invertebrate fossils: Trilobites, Brachiopoda, Cephalopoda and Echinodermata.

REFERENCE BOOKS

1. Barnes. R.D. 1974 Invertebrate Zoology. W.B. Saunders Co.,Philadelphia.
2. Hyman L.H. 1951 The Invertebrata, Vol I to VI. Mc Graw – Hill Book Co., New York.
3. Carter, G.S.A. 1969. General Zoology of Invertebrates. Sidewick and Jackson Ltd., London.
4. Borradile, L.A. Eastham, L.E.S. and J.T. Saunders. 1977 The Invertebrate Cambridge University Press.
5. Barrington, E.J. W. 1969. Invertebrate Structure and Functions. English Language Book Society.
6. Moore, R.C. Lalicker, C.G. and Fisher, A.G. 1952 Invertebrate Fossils. Mc Graw Hill Book Co., New York
7. Gardinar, M.S. 1972 Biology of the Invertebrates, McGraw - Hill Book Co., New York.

PAPER-2

LIFE AND DIVERSITY OF CHORDATES

OBJECTIVES

To comprehend the systematic position, functional morphology, mode of life, affinities and biodiversity of chordates.

UNIT-I: TAXONOMY

Principles of taxonomy

Nomenclature- Binomial, Trinomial nomenclature.

Suffix as for super family name-(oidea), familyname (idea), use of suffixes 'i', 'orum', 'ae', 'arum', 'ensis' and 'iensis'.

Tautonyms synonyms and Homonyms.

New trends in taxonomy: Ecological approach, Ethological approach, Cytological approach, Biochemical approach and Numerical taxonomy.

Taxonomic key: Indented, Simple non-Bracket Grouped type, combination

Pictorial: Branching type, Circular and Box-type.

UNIT-II

Prochordate: Systematic position and phylogeny of Prochordates.

Ostracoderms: Silurian and Devonian Ostracoderms. Evolutionary position of the Ostracoderms.

Placoderms: Origin of Jaws- Structural peculiarities of Cyclostomata.

UNIT-III

Chondrichthyes: Fossil history of chondrichthyes, tendencies in Elasmobranch evolution.

Actinopterygii: Origin and evolution, Adaptive radiation of bony fishes.

Amphibia: Origin and evolution of Amphibia.

UNIT-IV

Reptilia: Evolution of Reptilia. Saurischian and Ornithischian Dinosaurs - Rhyncocephalia - Adaptive radiation of Reptiles.

Aves: Birds as glorified reptiles. Fossil history of birds. Palate in Birds. Adaptive radiation in birds.

Mammal: Evolution of Mammals, Structural peculiarities of Prototheria, Metatheria and Eutheria.

UNIT-V

Comparative anatomy: Origin and evolution of the vertebrate integumentary system. Paired fins and limbs, heart and aortic arches and brain of vertebrates.

REFERENCE BOOKS

1. Waterman. A.J. 1971. Chordate Structure and Function. McMillan Co. London.
2. Jolie, M. 1968. Chordate Morphology. East West Press. Pvt, Ltd,
3. Romer, A.S. and Parson, T.S. 1978 Vertebrate Body. W.B. Saunders Co.,Philaelphia.
4. Young, J.2.1969. Life of Vertebrates. Clarendon Press, Oxford.
5. Colbert, E.H. 1969. Evolution of Vertebrates. John Wiley and Sons Inc, New York.
6. Holstead. 1969 The Pattern of Vertebrate Evolution. Freeman and Co. San Francisco. U.S.A.
7. Hobart M. Smith, 1960 Evolution of Chordate Structure, Holt, Rinehart and Winston. Inc. New York.
8. Kapoor, V.C. 1998 Theory and Practice of Animal Taxonomy. Oxford and IBH Publishing Co., Pvt, Ltd. New Delhi.
9. Hyman, L.H. 1966. Comparative Vertebrate Anatomy. The University of Chicago Press, Chicago.

PAPER-3

CELL AND MOLECULAR BIOLOGY

OBJECTIVES

To understand the structure and molecular basis of cellular interactions, energy transformation, regulation and control of genes, cell cycle and information transfer.

UNIT-I: STRUCTURE AND FUNCTIONS OF CELL ORGANELLES

Plasma membrane: Structure, Membrane receptors, Membrane transport - Membrane Potentials – cell adhesion, intercellular recognition - Intercellular junctions.
Endoplasmic reticulum-intracellular transport

Mitochondria - Energetics - Cellular respiration - mitochondrial replication.

UNIT-II: NUCLEUS

Cytoplasmic interactions. Nuclear receptors, Cell fusion: homokaryons, heterokaryons.

Structure and function of Chromatin- Euchromatin and heterochromatin - Polytene and lambrush Chromosomes

UNIT-III: CELL CYCLES AND CANCER CELL

Cell cycles - its components G_O-G_1 transition - Spindle organization - Chromosome movements - Regulation and synchronization of cell division.

Cancer cell: Differences between normal and cancer cell- structural and functional characteristics -Tumour Viruses-Oncogenes - Environmental factors inducting cancer. Hormones in relation to cancer-Theories of carcinogeneis.

UNIT-IV: CHEMISTRY OF NUCLEIC ACIDS

Chemistry of DNA - Polymorphism of DNA - Mechanism and enzymology of DNA replication - DNA repair.

Chemistry of RNA - Different types of RNA and their functions.

UNIT-V: INFORMATION TRANSFER

Information transfer in Prokaryotes AND Eukaryotes. Transcription - Promotors - Initiators and terminators – Post Translation modifications- post transcriptional modifications. Trimming of introns and splicing of exons. RNA processing

REFERENCE BOOKS

1. De Robertis. E.D.F. and De Robertis. E.M.F. 2001. Cells and Molecular Biology, B.I Publications Pvt Ltd, India.
2. Lewin, B.2000 Genes VII. Oxford University Press, New York.
3. Howland J.L. 1973. Cell Physiology, McMillan Publishing Co., New York.
4. De Witt, 1977. Biology of the cell. An evolutionary approach. Saunders Company.
5. Karp, G. 1979. Cell Biology. McGraw Hill Ltd., Japan.
6. Avers. C.J., 1976. CellBiology. Van Nostrand Company, New York.
7. Korenberg. A. 1974. DNA Replication. Dorothy- W.H. Freeman and Company, San Francisco.
8. Hawkins, J.D.1996. Gene Structure and Expression, Cambridge University Press, London.
9. Shanmugam, G., 1988. A laboratory manipulation in fish. Madurai Kamaraj University.
10. Albert, B and Watson. J.D. 1990. Molecular Biology of the cell. Garland Publishing, London.
11. Malacinski, G.M. 2005. Essentials of molecular biology. Narosa Publish House, Chennai.
12. Lodish, H., Berk A .,Matsudaira, P., Kaiser, C.A., Krieger, M., Scott, M.P., Zipursky, S.L.and Darnell, J. 2004. Molecular Cell Biology. W.H. Freeman & Co., New York.

ELECTIVE

PAPER-1

(to choose either A or B)

A. AQUACULTURE AND FARM MANAGEMENT

Objectives

The objective of the paper is to understand the culture practices of both fin fish and shell fishes in India and World. This paper is planned to teach in the lines of knowing the candidate species of important fin and shell fishes. Gaining knowledge in the food and feeding habits, investigating the seed production and farm management and method of farming. And this paper also to provide scope for employment opportunities in aquaculture activities.

UNIT-I: Introduction to Aquaculture

Importance of aquaculture, Global scenario, Present status in India - Prospects and scope.

Aquaculture Farms

Site selection, topography, water availability and supply, soil conditions and quality. Design and layout, structure and construction.

UNIT II: Biology of important cultivable species and their economics

Standard guidance for choosing cultivable species - Seaweeds, Crustaceans (Prawns & Lobsters), Molluses (Clams, Cockles, Mussels and Oysters) and fishes-biological criteria - Environmental adaptability and compatibility - Economic importance - economics, market values, by-products and availability in adjacent region.

UNIT-III: Survey of seed Resources and Seed & Feed Production

Distribution and abundance of natural seed resources, collection methods and segregation.

Artificial seed production - breeding under controlled condition, induced breeding technique, larval rearing, packing and transportation.

Live feed - Microalgae, Rotifer and Artemia - their culture. Feed formulation - Conventional and non-conventional ingredients, feed additives, feed attractants and feed formulations.

UNIT-IV: Culture systems

Traditional, Extensive , Semi-intensive and intensive systems, composite fish culture, paddy-cum-fish culture, integrated fish culture, sewage water fish culture, raceway culture, cage, pen and rack culture. Culture system management - pond preparation, production and economics-employment opportunities in aquaculture.

UNIT-V: Farm Management

Water quality management - temperature, salinity, pH, O_2, CO_2 levels, nutrients and trace elements.

Control of parasites, predators, weeds and diseases in culture ponds.

Disease diagnosis - ELISA, Western blotting - DNA based diagnosis of diseases and fish vaccines.

REFERENCE BOOKS

1. Balugut, E.A.1989. Aquaculture system and practices. A selected review publishing House, New Delhi.
2. Dash, M.C. and Patnik, P.N.1994. Brackish water culture. Palani Paramount publications, Palani.
3. Michael, B.N. and Singholka, B. 1985. Freshwater Prawn Farming. A manual of culture of Macrobrachium rosenbergii. Daya Publishing House, New Delhi.

4. Paul Raj, S. 1995. Shrimp Farming techniques, Problems and solutions. Plani Paramount Publications, Palani.
5. Paul Raj, S. 1996. Aquaculture for 2000 A.D. Palani Paramount Publications, Palani.
6. Pillay, T.V.R. 1990 Aquaculture Principles and Practices. Blackwell Scientific Publications Ltd.
7. Ponnuchammy, R.1997. Practical Guide to shrimp farming. Palani Paramount Publications,palani.
8. Post, G.M. 1983. Text Book of Fish Health. TFH Publication.
9. Sinha, V.R.P. and Srinivastava, H.C. 1991. Aquaculture Productivity. Oxford and IBH Publications Co., Ltd., New Delhi.

PAPER-1

B. BIOSTATISTICS AND BIOINFORMATICS

OBJECTIVES

- To understand the basic concepts of biostatistics and bioinformatics.
- To solve biological problems through computational management.

UNIT-I: INFERFTIAL STATISTICS

Introduction: Definition of statistical population and sample in biological studies. Variables: qualitative and quantitative, Discrete and continuous.

Probability; Basic principles - apriori and aposteriori probabilities - addition and multiplication rules of probability. Conditional probability. Theoretical distribution, normal binomial and Poisson - application (computation required).

UNIT-II

Hypothesis testing - Null hypothesis - levels of significance - degrees of freedom - type I and type II errors.

Test of significance: Chi-square test for goodness of fit, homogeneity and association between attributes (Problem relating to Genetics, patterns of distribution etc. to be worked out.

Test of significance for large and small samples - comparison of sample mean with population mean comparison of two - sample (computation required)

UNIT-III: CORRELATION AND REGRESSION

Correlation: definition and types - simple, multiple -partial, linear, nonlinear, mutual, cause and effect etc.

Uses of scatter diagram and correlation graph in the study of correlation between two variables. Computation of Karl Pearson's co-efficient of correlation - testing its significance, Interpretation.

Regression analysis, derivation of regression equation between two variable regression coefficient - construction of regression lines - properties - application. ANOVA

Population Statistics -Vital statistics - natality and morality rates. Population estimation - population growth.

UNIT-IV: BASIC BIOINFORMATICS

Bioinformatics - Biological /Specialized Database - Servers for Bioinformatics (NCBI, EBI, Genoment) Virtual Library - Data mining - Data Warehousing - Searching techniques - Genomics - Proteomics.

UNIT-V: ALGORITHM IN BIOINFORMATICS

Algorithm and tools sequence analysis - Similarity Search - Genetic algorithm - Gene finding - Protein prediction - Biomolecular visualization - Phylogenetic analysis - Drug designing.

REFERENCE BOOKS

1. Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-Hill Inc, New York.
2. Schefler, W.C. 1963 Statistics for biological sciences. Addition - Wesely Publication Co., London.
3. Snedecor, G. Wand Cocham, W. G. 1967 Statistical Methods. Oxford Publication Co., New Delhi.
4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series McGraw -Hill International Book Co., Singapore.
5. Pillai, R.S.N. and Bagawathi, V.2005 Statistics. S. Chand & Co.Ltd, New Delhi.
6. Stansfield,W.O. 1984 Theory and Problems of genetics(including 600 problem) Schaum's outline series.McGraw - Hill Book, Co., New York.

7. Sokal,R.R.and Rohlf, F .J 1969 Biometry.The Principles and Practice of Statistics in Biological Research.W.H.Freman and Co.,San Francisco.
8. Mahajan, B.K. 1984. Methods in Biostatistics for Medical students and researchWorkers. Smt. Indu Mahajan, New Delhi.
9. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.
10. Westhead, D.R., Parish, J.H. and Tugman, R.M. 2003 Bioinformatics. Viva Books Pvt. Ltd., New Delhi
11. Arthur, M.L. 2003. Introduction to Bioinformatics Oxford University Press, New Delhi.
12. Higggins D.and Taylor, W. 2000 Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, New Delhi.
13. Durbin, R., Eddy, S.R., Krogh, A. and Mitchison, G. 1998. Biological sequence Analysis.Cambridge University Press, Cambridge, U.K.
14. Baxevanis, A. and Ouellette, B.F. 1998. Bioinformatics: A practical guide to the analysis of genes and proteins. Wiley Interscience, Hoboken, New Jersey, USA.
15. Arthur M. Lesk. 2006. Introduction to Protein structure. Oxford University Press, New Delhi.

SEMESTER II

PAPER-4

GENETICS

OBJECTIVES

- To understand the fine structure of genetic materials and regulation of their action.
- To know the chromosomal basis of genetic disorders, development and differentiation.
- Also, to acquire the knowledge of the importance of population genetics and nuances of genetic engineering and applied genetics.

UNIT-I: MOLECULAR STRUCTURE OF GENETIC MATERIAL

Molecular structure of DNA and RNA – Replication of DNA and RNA-theories, Gene concept - One gene one polypeptide concept.

Identification of DNA and RNA as the genetic material.

Microbial Genetics - Conjugation, transformation and transduction and Sexduction.

Chromosome mapping in prokaryotes (Virus, Bacteria) and eukaryotes (Neurospora and Man)

UNIT-II: REGULATION OF GENE ACTION

Enzyme regulation of gene action. Gene regulation of gene action - Operon concept - GAL and LAC Operon system. Evidence of regulation of gene action.

Genes and metabolism. Inborn errors of metabolism in Man (With reference to protein, carbohydrates, Lipid and nucleic acid).

UNIT-III: CHROMOSOME AND GENETICS DISORDERS

Sex chromosomes. Dosage compensation - X inactivation. Geneomic imprinting.

Human Genetics: Variations in karotypes (autosomal and sex chromosomal) with special reference to klinfelters,Turners and Down's syndromes in man. Genetic counselling - Objectives, ethics and principles.

UNIT-IV: GENES IN DEVELOPMENT, RADIATION GENETICS AND POPULATION GENETICS

Genes in development and differentiation Mechansim of chromosomal breakage - physical chemical and biological factors or agents. Mutagens and mutagenesis and carcinogenesis - genetic changes in Neoplasia in man

Population genetics:

Population and gene pool. Hardy Weinberg Law-Genetic equilibrium.

Calculation of gene frequencies for Autosomal (Complete dominance, codominance and multiple alleles) and sex linked genes. Factors affecting Hardy Weinberg equilibrium.

UNIT-V: GENETIC ENGINEERING AND APPLIED GENETICS

Genetic Engineering - Restrictive enzymes - Recombinant DNA techniques. Applications of Recombinant DNA technology.

Applied Genetics - Application of genetics in animal breeding. Application of genetics in Crime and Law - DNA fingerprinting, Genetic basis of intelligence. Studies on Twins.

REFERENCE BOOKS

1. Watson. J.D. Hopkins, N.H.., Roberts, J.W., Steitz, J.A. and Weiner, A.M. 1987 Molecular Biology of the Gene. W.A. Benjamin/Cummings Co., New York.
2. Sinnot. E.W., Dunn. L.C., Dobzhansky, T.H. 1973. Principles of Genetics. McGraw Hill Co., New Delhi.
3. Daniel L. Hartl. 1994. Geneties. Jones and Barflaff Publishing, Boston.
4. Lewin, B. 2000. Genes VII. Oxford University Press, New York.

5. Ayala, F. I. and Kieger, J.A. Jr., 1980, Modern Genetics. The Benjamin Publishing Co. London,
6. Goodenough, U. 1984. Genetics. Saundes College Publishing Co., London.
7. Curs Sten 1973 Principles of Human Genetics. W.H. Freeman and Co., New York.
8. Jenking, J.B. 1983. Human Geneties. The Benjamin Cummings Publishing& Co., Londan.
9. Market, C.L. & Ursprung, 1973. Development Genetics, Prentice Hall.
10. Gardner E.J. Simmons, M.J. and Snustad, D.P.1991 John Wiley & Sons, New York.
11. Tamarin, R.H. 1996. Princples of Geneties, WCB Publishers Munro.
12. Stickberger, M.W. 1985. Genetics. Printice - Hall of India, Pvt. Ltd., New Delhi.
13. Pandian, T.J. and Muthukrishnan, J. 1988. Workshop on Research Methods for Chormosomal Manipulation in Fish. Department of Biotechnology Govt. of India, New Delhi.
14. Pandian, T.J. and Muthukrishnan, J. 1990. Research Methods for Gene and Choromosome Manipalation in Fish. Department of Biotechnology, Govt. of India, New Delhi.

PAPER-5

ENVIRONMENTAL BIOLOGY

OBJECTIVES

- To generate up-to-date knowledge on environmental conservation and management.
- To understand the components of ecosystem, habitat ecology and resource ecology, biogeochemical cycle.
- To create awareness on pollution and its management.

UNIT-I: ECOSYSTEM AND COMMUNITY

Review of concept of ecosystem - Natural and Man-made ecosystem, with examples. Biomass-Energy flow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement.

Definition, nature and flux of energy through communities. Influence of competition, predation. Community succession - homeostasis.

UNIT-II: HABITAT AND POPULATION

Habitat- Definition-Physico-chemical features of Terrestrial and aquatic habitats

Biomass, Adaptations with reference to physico - chemical features of environment of coastal ecosystems.

Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

UNIT-II: POPULATION AND BIOLOGICAL CYCLES

Structure and distribution - Growth curves - Groups, natality, Mortality - Density indices, Life study tables - factors affecting population growth - Carrying capacity. Population regulation and human population control.

Complete and incomplete biogeochemical cycles - Sedimentary cycle - Recycle pathway of elements - Cycling of non - essential and organic nutrients.

UNIT-IV: ENVIRONMENTAL CONSERVATION AND MANAGEMENT

Principles of conservation - Rain water harvesting - Soil health and fauna inputs in agriculture Biosphere reserves - wildlife conservation and management. Biodiversity - Germplasm conservation and cryopreservation. Social forestry - tribal welfare.

UNIT-V: POLLUTION AND MANAGEMENT

Environmental pollution and its biological effects. Air, water, soil and noise pollution. Biological indicators and their role in environmental monitoring.

REFERENCE BOOKS

1. Odum. E.P. 1996 Fundamentals of Ecology. Nataraj Publishers, Dehra Dun.
2. Trivedi, P.R.and Gurdeepraj, K. 1992. Environmental Biology. Akashdeep Publishing House New Delhi
3. Berwer. A.1988 .The Science of ecology. Saunder's college publishing.
4. Bandopadhyay, J.1985. India's Environment Crisis and response. Nataraj Publishers,Dehra Dun.
5. Smith, R.L.1986. Elements of Ecology. Harpet and Row Publishers, New York.
6. Ismail, S.A.1997. Vermicology, Biology of Earthworms. Orient Longman, Chennai.
7. Alpha Soli, I. Arceivala.1998. Wastewater treatment for pollution control - Second Ed. Tata McGraw Hill Publication Company Ltd., New Delhi.
8. Asthana, D.K. and Asthana, M.2001. Environmental Problems and Solutions. S. Chand and Co., New Delhi.

PAPER-6

BIOTECHNOLOGY

OBJECTIVES

- To familiarize the use of the data and techniques of biotechnology in living organisms.
- To find solution of problems concerning human activities including agriculture, medical treatment, industry and environment.

UNIT-I: RECOMBINANT DNA TECHNOLOGY

Gene cloning - the basic steps - various types of restriction enzymes - ligase linkers and adaptors - c DNA - transformation - Selection of recombinants. Hybridization techniques chemical systhesis of oligonucleotides.

Gene probe - Molecular finger printing (DNA finger printing) - RFLP - the PCR techniques - Genomic library - Blotting techniques - Southern blotting - Northern blotting - Western blotting

UNIT-II: CLONING VECTORS

Plasmid biology - cloning vector based on *E. coli* PBR 322 and bacteriophage. Cloning vector for yeast. Cloning vector for Agro bacterium tumefaciens. Cloning vector for mammalian cells - Simian virus 40 - Gene transfer technologies. Human welfare-Genes for vaccines-monoclonal antibodies.

UNIT-III: ANIMAL BIOTECHNOLOGY

Cell culture - Organ culture - whole embryo culture - Embryo transfer - In vitro fertilization (IVF) technology - Dolly - embryo transfer in human. Transgenic animal. Human gene therapy. Cryobiology. Bioethics in animal genetic engineering.

UNIT-IV: MICROBIAL BIOTECHNOLOGY

Fermentation - bioreactor - Microbial products - Primary & Secondary Metabolites - enzymes technology - single cell protein (SCP). Biopolymers, Biopesticides and Biofertilizers. Biological control-microbial inoculants.

UNTI-V: ENVIONMENTAL BIOTECHNOLOGY AND APPLICATIONS OF BIOTECHNOLOGY

Bioremediation - bioremediation of hydrocarbons - Industrial wastes - Heavy metals - Xenobiotics - bioleaching - biomining - biofuels. Applications of biotechnology in agriculture, medicine and food science. Genetically modified organism (GMO'S) - GM foods. Biotechnology & biosafety – IPR- Patent- patenting of biological materials-product patents.

REFERENCE BOOKS

1. Purohit, S.S. and S.K.Mathur. 1999. Biotechnology Fundamentals and Application. Agro Botanica, New Delhi.
2. Alan Scragg. 1999. Environmental Biotechnoogy, Longman Publication.
3. R.C.Dubey 2001 A text book of biotechnology. Rajendra Ravindra Printer. New Delhi.
4. T.A. Brown 2004 Gene cloning and DNA analysis. Blackwell Science, Osney Mead, Oxford.
5. Dawson, M.T., Powell .R, and Gannon, F. 1996. Gene Technology. Bios Scientific Publishers.
6. Chopra, V.L. and Nanin, A.1992. Genetic Engineering and Biotechnology. Oxford and I BH Publishing Co., New Delhi.
7. Marx, J.L.1989 A Revolution in Biotechnology. Cambridge University, Press, Oxford.
8. Old, R.W.and Primrose, S.B.1985 Principlesof Gene Manipulations. An introduction to Genetic Engineering. Oxford Blackwell Publishers, London.
9. Winnacker, E.L. 2003. From Genes to Clones. Panima Publishing Corporation, New Delhi.
10. Gupta, P.K. 2004. Biotechnology and Genomics. Rastogi Publications, Meerut.
11. Das, H.K. 2004. Text Book of Biotechnology. Wiley Dreamtech India Pvt. Ltd., New Delhi.

ELECTIVE

PAPER-2

(to choose either A or B)

A. ENDOCRINOLOGY

OBJECTIVES

- To learn the objectives of endocrinology.
- To study the comparative account and functions glands of vertebrates, crustacean and insect with their functions.

UNIT-I: GENERAL ENDOCRINOLOGY

Endocrine glands and its hormones- classification-features. Endocrine glands in crustaceans, insects and vertebrates. Hormonal effects and regulation- Experimental methods of hormone research - general classes of chemical messengers-General classes of hormones.

UNIT-II: PHYLOGENY AND ONTOGENY OF ENDOCRINE GLANDS

Pituitary, Pancreas, Thyroid, Parathyroid, Adrenal, Thymus, Testis and Ovary in the following classes Pisces, Amphibians, Reptiles, and Mammals.

UNIT-III: INSECTS AND CRUSTACEAN ENDOCRINILOGY

Concepts of neurosecretions-endocrine systems in crustaceans-endocrine control of moulting and metamorphosis-neuroendocrine system in insects-endocrine control of moulting-metamorphosis, and reproduction.

UNIT-IV: VERTEBRATE REPRODUCTIVE ENDOCRINOLOGY

Structure of mammalian testis and ovary-male and female sex accessory organs-hormones of testis and ovary-estrous and menstrual cycle-hormones of pregnancy-parturition-hormonal control of lactation.

UNIT-V: HORMONES AND HEALTH

Hormonal control of metamorphosis in an anuran amphibian. Hormones and health-production of hormones as pharmaceuticals.

REFERENCE BOOKS

1. Haris, G.W. and B.T. Donovan. 1968. The Pituitory Gland. S. Chand and Co.,
2. Bentley, P.J. 1985. Comparative vertebrate endocrinology, Second Edition, Cambridge University Press. Cambridge.
3. Mac Hadley. 1992. Endocrinology, 3rd Edition. Prentice - Hall Inc. A Simon & Schuster Company, Englewood Cliffs, New Jersey. USA.
4. Ingleton, P.M. and J.T. Bangara. 1986. Fundamentals of comparative vertebrate endocrinology, Kluwer Academic Publishers.
5. Turner, C.D. and J.T. Bangara. 1986. General endocrinology. Saunders International Student edition. Toppan Company Limited. Tokyo.
6. Barrington, E.J.W. 1985. An introduction to general and comparative endocrinology. Claredon Press Oxford.

B. BIOCHEMISIRY

OBJECTIVES

- To study the chemical constituents of living matter, chemistry of food stuffs and its metabolism in animal systems.
- To know the bioenergetics and hormonal regulation.

UNIT-I: WATER

Water - Biological importance, pH and Acid - Base balance. Henderson Hasselbach equation. Buffers - Biological importance. Acidosis, Alkalosis. Electrolyte and water balance.

UNIT-II: BIOMOLECULES

Amino acids - structure, classification and function. Peptide bonds. Essential and non - essential amino acids, isoelectric point, switter ion. Protein - structure, classification, Properties of protein - Deamination, transamination, transmethylation.

Carbohydrate - structure, classification and biological significance.

Lipid - Structure classification and biological significance

UNIT-III: ENZYME AND BIOENERGETICS

Enzymes - general properties, function, classification, nomenclature. Enzyme kinetics - Factors affecting enzyme action, Mechanism of enzyme action, Enzyme regulation.

1. Glycogenesis, 2. Glycogenolysis, 3. Glyconeogenesis, 4. Glycolysis, 5. Hexose mono phosphate shunt. Biosynthesis and Oxidation of Fatty Acids. Energetics.

26

UNIT-IV: HORMONES

General function, Classification - Steroid Hormones, Protein Hormones.

Synthetic Hormones-Mechanism of Hormone action.

UNIT-V: VITAMINS

Water and Lipid soluble Vitamins - structure, classification, sources and deficiencies in man.

Reference Books

1. Murray, R. K, Granner, D.K. Maynes, P.A and Rodweli, V. W. 1998. Harper's Biochemistry. 25th Edition. McGraw Hill, New York.
2. Hames, B. D., Hoopa, N.M and Houghton, J.D. 1998. Instant notes in Biochemistry. Viva Books Pvt. Ltd. New Delhi.
3. Jain, J. L. Jain, S. and Jain N. 2005. Fundamental of Biochemistry, S. Chandra & Co. Ltd. New Delhi..
4. Vasudevan, D.M. and Sreekumar. S. 2000. Text of Biochemistry for Medical students. Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi.
5. Rama Rao, A.V.S.S. 1986. Text Book of Biochemistry. L.K. & S Publishers. A.P.
6. Ambika, S. 1990. Fundamentals of Biochemistry for Medical Students, Published by the author.
7. Lehninger, A.L. 2004. Principles of Biochemistry. CBS Publishers, New Delhi.
8. Zubay, G.1989. Biochemistry. McMillan Publishing Co., New York.
9. Voct, D and Voct, J.G. 2004. Biochemistry. John Wiley and Sons, Inc.

MAIN PRACTICAL

PAPER-1

LIFE AND DIVERSITY OF INVERTEBRATES AND CHORDATES AND CELL AND MOLECULAR BIOLOGY

INVERTEBRATA (Slides / Specimens / Xerox)

1. Identification and study of selected Protozoans and Helminthes of medical importance. (Any Two)
2. Identification and study of sections of available animals from Cnidaria, Aschelminthes and Annelida to understand the evolution of /different types of coelom.
3. Identification and study of larval forms from all major phyla of Invertebrates.
4. Identification and study of types minor phyla.
5. Identification and study of Invertebrate fossils
6. Dissection of digestive system of any insect, pila, sepia / loligo
7. Dissection of nervous system of Prawn, any insect, Pila,and Sepia/Loligo.
8. Dissection of reproductive system of any insect.
9. Mounting of:

a. Appendages or Prawn

b. *Gnathochilarium*, Radula of Pila

c. Sting of Honey bee

d. *Pedicellaria* of Sea urchin-Demonstration

e. Aristotle's lantern of sea urchin-Demonstration

10. Study of prepared slides of mouth part of Honey bee, Housefly, Mosquito, Bed bug and Butterfly to relate structure and function.

CHORDATA (Slides / Specimens / Xerox)

1. Study of the following specimen to bring out their affinities: a. Amphioxus

b. Balanogossus

c. Ascidian

d. Peteromyzon

2. Study of the following specimens with reference to their adaptive features for their respective modes of life

a. Echeneis

b. Ichthyophis / Uraeotyphlus

c. Hyla

d. Draco

e. Pigeon

f. Bat

3. Study of the following skull types with reference to jaw suspensions a. Fish

b. Frog

c. Calotes

d. Snake

e. Rat/Rabbit

4. Dissection and mounting of Webberian ossicles in Cat fish.
5. Dissection of aortic arches in Teleost
6. Dissection of aortic arches in Calotes/rat
7. Dissection and display of IXth and Xth Cranial nerves of cat fish
8. Demonstration of portal system of Rat
9. Demonstration of urinogenital system of Rat.

CELL AND MOLECULAR BIOLOGY

CYTOLOGICAL TECHNIQUES

Micrometry-measurements using ocular and stage micrometers-measurements of cell from any prepared slide.

Vital staining-Buccal smear stained with methylene blue.

CHROMOSOME

Chromosome preparation-procedure. Preparation of meiotic chromosomes from any fish (demonstration)

MOLECULAR BIOLOGY TECHNIQUES (Demonstration only)

Centrifuge, Isolation of DNA from Liver-Isolation of RNA-Denaturation of DNA-measurement of spectrophotometry-isolation and analysis of proteins-electrophoresis.

MAIN PRACTICAL

PAPER-2

GENETICS, ENVIRONMENTAL BIOLOGY AND BIOTECHNOLOGY

GENETICS

1. Preparation of culture medium Culture of Drosophila. Methods of maintenance. Sex identification. Identification of four mutants.
2. Identification of blood groups A,B, ABO and Rh.
3. Mounting of salivary glands of Drosophila larva or Chironomus larva. Analysis of banding pattern
4. Preparation of Buccal smear to show squamous epithelial cells.
5. Karyotyping using human metaphase chromosome plates (Giemsa stained). Eye Karyotyping, Identification of syndromes (Down, Klinefelter and Turner) from Karyotype Photographs showing clinical features of each syndrome case.
6. Problems relating to the application of binominal theorem in population genetics with reference to P.T.C., Earlobe attachment etc.

ENVIRONMENTAL BIOLOGY

1. Estimation of Aquatic - Primary productivity - Dark and Light bottle.
2. Estimation of Dissolved oxygen, Salinity, Nitrites, Phosphates, Calcium, Silicates and Alkalinity in water samples.
3. Analysis of Industrial effluent - TDS, TSS, BOD, (COD - Demonstration).
4. Collection, isolation and identification of Plankton.
5. Study of sandy, muddy and rocky shore fauna with special reference to the adaptation to the environment.
6. Animal Association - parasitism, mutualism and commensalisms.

7. Visit to:-

a). Drinking

b). Effluent treatment plant

c). Sewage treatment plant.

d). Sandy, Muddy and Rocky Shores.

BIOTECHNOLOGY

Visit to Biotechnology Laboratory to observe the demonstration of,

1. Tissue culture.
2. Titration and preparation of virulent phage.
3. Isolation of DNA from the plasmids.
4. Restriction enzymes digestion of DNA.
5. DNA electrophoresis in Agarose gel.

Necessary books may be referred to learn the techniques and to be recorded in the record Note books. Observation of photographs of different instruments used in Biotechnology, their principles and applications.

ELECTIVE

PRACTICAL

PAPER-1

(to choose either A or B)

A.ENDOCRINOLOGY

Dissection and localization of endocrine glands in any one suitable vertebrate.

Dissection of neuroendocrine complex in insects.

Parabiosis in insect - cockroach.

Ovariectomy in cockroach.

Histology of pituitary, thyroid, adrenal, pancreas, testis and ovary.
Permanent slide preparation of any one endocrine gland

ELECTIVE

PRACTICAL

PAPER-1

B.BIOCHEMISTRY

1. Buffer preparation and determination of PH - Demonstration,
2. Enzyme kinetics - anyone enzyme (Salivary amylase) Maltose standards, influence of enzyme concentration, time course, pH, Temperature, Substrate concentration (Lineweaver Burk Plot) on enzyme activity.
3. Qualitative analysis of urine - protein, glucose, Ketone and acetone bodies.
4. Chromatography: Determination of amino acids in body fluids and tissues of goat.
5. Quantitative estimation of glucose, protein, cholestoerol, urea and creatinine in the serum of goat.

Principles and application of spectrophotometry or colorimetry, electrophoresis, centrifuge, Chromatography.

SEMESTER III

PAPER-7

ANIMAL PHYSIOLOGY

OBJECTIVES

- To gain knowledge on organs system and functions.
- The physico-chemical coordination of the animals.

UNIT-I: NUTRITION

Nutrition - nutrients - digestion and adsorption of proteins, carbohydrates and lipids. Role of gastrointestinal hormones in digestion.

UNIT-II: RESPIRATION AND CIRCULATION

Physiology of respiration in Man. Respiratory Pigments, nervous and chemical control of respiration, BMR.

Circulation - types of hearts - physiology of cardiac muscle - heart beat and its regulation - blood coagulation and theories.

UNIT-III: EXCRETION AND OSMOREGULATION

Excretion - excretion of metabolic waste products in relation to the environment - physiology of excretion in Man

Iono - osmoregulation in Invertebrates (crustaceans), fishes, birds and mammals - hormonal control.

UNIT-IV: ANIMAL AND REPRODUCTION

Neuro muscular co-ordination - types of neurons, transmissions of nerve impulse and reflex action. Chemical composition of muscle fiber and physiology of muscle contraction. Myoneural Junction. Endocrine glands in mammals - Physiology of mammalian reproduction - reproductive cycle - hormonal control of reproduction.

UNIT-V: BEHAVIOURAL PHYSIOLOGY

Bioluminescence - chemistry and functional significance. Behaviour (types - trophism, taxis, kinesis, reflex, learning). Temperature regulation: Poikilotherms, homeotherms and heterotherms - hibernation, aestivation - diapause.

REFERENCE BOOKS

1. Hoar, W.S.1991. General and Comparative Physiology. Prentice Hall of India, New Delhi.
2. Prosser, C.L. 1973. Comparative Animal Physiology, 3rd edn. W.B. Saunders & Co., Philadelphia.
3. Barrington, E.J.W.1975. An Introduction to General and Comparative Endocrinology. Clarendon Press, Oxford
4. Bentley, P.J.1971. Endocrine and osmoregulation, Springer Verlag, New York.
5. Palmen,J.D. Brown, I.R and Hastings, J.W.1970. Biological clocks, Academic Press, London.
6. Welson, A. 1979. Principles of Animal Physiology.McMillan Publishing Co. Inc. New York.
7. Schmidt Nelssen, K.1985. Animal Physiology. Adaptation and Environment Club, London.
8. Herkat, P.C.and Mathur, P.N.1976. Text Book of Animal Physiology.S.Chand Co. Pvt, Ltd., New Delhi.

PAPER-8

DEVELOPMENTAL BIOLOGY

OBJECTIVES

- To gain knowledge on the experimental aspects of embryology.
- To study the modern tools in embryology.

UNIT-I: EARLY DEVELOPMENT

Gastrulation movements: role of egg cortex - cell surface in morphogenesis. Cell adhesion and cell communication. Chemotactic induced aggregation - aggregation in sponges. Experimental analyses in the early development of Echinoderms, Amphibians and birds.

UNIT-II: ORGANOGENESIS

Formation of organ rudiments, differentiation and development of heart and kidney in different mammals. Organiser, Inductive tissue interactions in developments.

UNIT-III: GENES AND DEVELOPMENT

Nuclear transplantation. Cellular differentiation and protein synthesis. Differential activation. Developmental genetic defects. Role of cell death in development.

UNIT-IV: REGULATION OF DEVELOPMENT

Metamorphosis - morphological and biochemical changes during amphibian metamorphosis. Hormonal control of metamorphosis in amphibians - Neuro endocrine control of insect metamorphosis - Biochemistry and mechanism of action of hormones during metamorphosis

UNIIT-V: EMBRYONIC NUTRITION

Nutritional requirements of Embryo- modes of embryonic nutrition –Food reserve and embryonic nutrition- embryonic nutrition from mother –physiology of placenta

REFERENCE BOOKS

1. Balinsky, B.I.1981 An Introduction to Embryology. W.B Saunders Co., Philadelphia.
2. Karp,G. and Berrill,N.J.1981. Development. McGraw Hill, New York.
3. Saunders, J.W.1982. Developmental Biology. MacMillan Co., London.
4. Nagabhushanam,R. and Sarojini,R.2002 Invertebrate Embryology. Oxford and IBA Publishing Co.
5. Tyagi,Rajiv and Shukla,A.N.2002. Development of Fishes. Jaya Publishing House, New Delhi.
6. Browder, W.1984.Developmental Physiology. Saunders College Publishing, Rinchert and Winston.
7. Gilbert, S.F.2003.Developmental Biology. Sinamer Associates Inc. Saunderland, Massachusets, U.S.A.
8. Oppenheimer, S.B.1980.Introduction to Embryonic Development. Allyn and Bacon,Inc. U.S.A.
9. Mitra, S.1994. Genetics, A Blueprint of Life. Tata McGraw - Hill Publishing Company Ltd., New Delhi.

PAPER-9

IMMUNOLOGY

OBJECTIVE

- To Understand the Structural and functional basis of immunogloy and immune system.
- To understand the mechanism of antigen-antibody reaction.

UNIT-I: IMMUNE BIOLOGY

The cellular constituents of the lympho reticular system-phagocytic cells-poly morpho nuclear neutophils, mono nuclear phagocytes eosinophils and lymphocytes

UNIT-II: IMMUNOGLOBULINS

Immunoglobulins-structure, isotypes and biological function. Antigenic determinant on immunoglobulin-isotype, allotype and idiotype. Immunoglobulin superfamily, monoclonal and polyconal antibodies. organization and expression of immunoglobulin genes. Synthesis of immunoglobulin and disorders of immunoglobulin synthesis.

UNIT-III: DETECTION AND APPLICATION OF ANITGEN ANTIBODY REACTION

Precipitation - agglutination - complement fixation - immunoassay using labelled reagents

UNIT-IV: MECHANISM OR IMMUNE SYSTEM

Antigen-antibody interaction. MHC- Restriction organization and inheritance of MHC, Antigen processing and presentation.

UNIT-V: MEDIATORS OF IMMUNE SYSTEM

B-cell Receptors, T-cell receptors, cytokine, adhesion molecules, complements, hypersensitivity reaction, transplantation immunology.

REFERENCE BOOKS

1. Roitt,I.M.1994. Essential Immunology. Blackwell Scientific, Oxford.
2. Richard A.Goldsby, Thomas T.Kindt and Barbara A. Osborne. 2000. Kuby Immunology.Freeman and Co., New York.
3. Stites,D.P.,Terr,A.I. and Parsloio,T.G. 1997.Medical Immunology. Prentice Hall, New Jersey.
4. Janeway,C.A and Travers,P. 1997.Immunobiology.Current Biology Ltd., London.
5. Paul,W.E.M.1989. Fundamentals of Immunobiology. Raven Press, New York.
6. Srivastava,R.,Ram,B.P. and Tyle,P.1991. Molecular Mechanism of Immune Regulation. VCH Publishers, New York.
7. Champion,M.D. and Cooke,A.1987.Advanced Immunology. J.B.Lippincott Ltd., Philadelphia.
8. Kannan,I.2007. Immunology. MJP Publishers, Chennai.

ELECTIVE

PAPER-3

(to choose either A or B)

A. FISHERIES SCIENCE

OBJECTIVES

- The aim of the paper is to understand the morphology, classification and identification of fishes and the fisheries and fishery resources of India.
- Moreover information about the biology of the fishes goes a long way in managing the fishery resources and their sustainable utilization.
- As fishes constitute perishable commodity, preservation and processing are also quite essential.
- To know the different methods of preservation and processing of fishes.

UNIT-I: BIOLOGY OF FISHES AND CLASSIFICATION

General morphology and outline classification of fishes - major groups of fishes and their characteristics - morphometric and meristic characters of elasmobranchs and teleost fishes.

Basic anatomy of fish - digestive, circulatory, respiratory, nervous and reproductive systems.

Food and feeding habits, maturity, fecundity, spawning and survival of Indian fishes.

UNIT-II: GROWTH AND POPULATION DYNAMICS

Length-weight relationship and factors influencing growth condition, age determination

Theory of fishing, unit stock, recruitment, growth, mortality, migration, fish tagging and marking.

UNIT-III: INLAND CAPTURE AND MARINE CAPTURE FISHERIES OF INDIA

Fishery zones and type of fisheries in India.

Riverine, Estuarine, Coldwater, Reservoir and Pond fisheries.

Present status and scope of inland capture fisheries - their fishery characteristics, distribution and importance.

Present status and scope of marine capture fisheries - crustaceans crabs), (prawn/shrimp, lobster and Molluscs (clam, cockle, mussel, oyster, their cephalopods) and fishes - fishery characteristics, distribution and importance.

UNIT-IV: FISHERY SURVEY METHODS

Methods of surveying the fishery resources - acoustic method, aerial method, survey of fish eggs and larvae, analyzing population features - growth mortality selection.

UNIT-V: CRAFTS AND GEARS

Principal methods of exploitation of fishes - indigenous and modern gears and crafts.

Principal methods of fish preservation and processing in India

Types of spoilage, causative factors - marketing and economics.

REFERENCE BOOKS

1. Day, F. 1981. Fishes of India, Vol.I and Vol. II. William Sawson & Sons Ltd.,London.
2. Jhingran, C.G. 1981. Fish and Fisheries of India. Hindustan Publishing Co., India.
3. Maheswari, K. 1993. Common fish diseases and their control. Institute of Fisheries Education, Powakads, M.P.
4. Santhanam,R. 1980. Fisheries Science. Daya Publishing House, New Delhi.
5. Yadav, B.N. 1997. Fish and Fisheries. Daya Publishing House, New Delhi
6. FAO Volumes for fish identification.
7. Bal D.V. and Rao, K.V. 1990. Marine Fisheries of India. Tata McGraw Hill Publishing Co. Ltd., New York.
8. Biswas, K. P. 1996. A Text Book of Fish, Fisheries and Technology. Narendra Publishing House, Delhi.
9. Srivastava, C.B.L. 1999. Fish Biology. Narendra Publishing House, Delhi.

PAPER-3

B. BIOPHYSICS

OBJECTIVES

- To gain knowledge on the principles and methods in conducting a basic research.
- To know the principle and application of various research instruments.

UNIT-I: STRUCTURE OF BIOMOLECULES

Electron configuration of an atom. Bonds - Covalent bond, Hydrogen bond, Disulphide bond, Peptide bonds. Forces between Molecules - Electrostatic force, Van der Waal's forces - hydrophobic and hydrophilic - biological importance.

UNIT-II: THERMODYNAMICS AND BIOLOGICAL OXIDATION

Laws of Thermodynamics - Concept of free energy and entropy - Exergonic and Endergonic reactions. Rate of reactions - Effect of sunlight and temperature on reactions. Energy of Activation - Arrhenius expression.

Diffusion - Fick's Laws, constant laws. Osmotic coefficient - Gibbs Donnan equilibrium.

Oxidation and reduction reactions - Redox potentials in biological system, High energy phosphate group. Biouminescence.

UNIT-III: MICROSCOPY

Principle and biological application of Light microscope, Electron microscope, Polarising microscope, Fluorescent microscope, Phase contrast microscope, Dark field microscope, Interference microscope and X-ray microscope.

UNIT-IV: PHOTO BIOPHYSICS

Electromagnetic spectrum - visible and invisible region. Principles involved in Photoelectric colorimetry. Principle of Spectroscopy - UV & IR Spectroscopy in biological investigation. Effects of UV on biological systems.

Delayed effects of radiation - Ageing, reduction in life span, cancer.

Radioactive isotopes - measurements - GM tubes, Liquid Scintillation counters. Autoradiography. Effects of radiation.

UNIT-V: BIOPHYSICAL PRINCIPLES APPLIED TO PHYSIOLOGY

Biophysical aspects of vision, hearing, nerve conduction and muscle contraction.

REFERENCE BOOKS

1. Bose, S. 1982. Elementary Biophysics. Jyoth Books,
2. Bums, D.M. and MacDonald, S.G.G. 1979. Physics for Biology and Premedical students. ELBS and Addisson - Wesley Publishers Ltd., London.
3. Casey, E.J. 1962. Biophysics concepts and Mechanism. Affiliated East-West Press Pvt. Ltd., New Delhi.
4. Das, D. 1982. Biophysics and Biophysical Chemistry. Academic Publishers. New Delhi.
5. Epstein, H.T. 1963. Elementary Biophysics, selected topics. Addisson - Wesley Publishing Company Inc. London.
6. Palanichamy, S and Shanmugavelu, M. 1991. Priniples of Biophysics. Palani Paramount, Publication; Tamil Nadu.
7. Roy, R.N. 1996. A Text Book of Biophysics, New Central Book Agency Ltd, Calcutta.

SEMESTER IV

PAPER-10

RESEARCH METHODOLOGY

OBJECTIVES

- The main objectives of this paper are to expose students to state of the art instrumentation.
- To introduce them to the principles and methods of various instruments used in biology and to prepare them to use these techniques in their own research.
- The course is a combination of lectures and demonstrations on basic principles and applications of the Spectrophotometers, Chromatographs and Electrophoresis system.
- With the aid of computer system and software, the students are also given hands on training in bioinformatics.
- Also, this paper is to acquire knowledge on the preparation of research manuscripts etc.

UNIT-I: BIOSTATISTICS & BIOINFORMATICS

Collection and analysis of biological data - mean, median, mode Standard deviation, Standard error, Coefficient of variation, Student 't' test, Skewness, Kurtosis, Chi - square, Correlation, Regression and ANOVA.

Internet - Worldwide Web - Search Engines - their functions. Boolean searching - file formats.

Biological data bases - sequence and structure - date retrieval - searching source data bases - sequence similarity searches - FASTA and BLAST, clustral and phylip.

UNIT-II: SPECTROSCOPY

Absorption and Emission principles - Principle and application of UV-visible, Spectroflurometer, flame photometer, Atomic Absorption and emission spectrophotometers, NMR and Mass spectrometer in Biology.

UNIT-III: CHROMATOGRAPHY & ELECTROPHORESIS

Principles and Application of Chromatography: Paper, Thin layer, column, Ion Exchange, Gel filtration, Gas Liquid, HPLC and affinity. Principles and Application of Electrophoresis: Paper, Agarose, PAGE, SDS PAGE and Iso-Electric focusing.

UNIT-IV: MICROSCOPY

Principles, construction and biological uses of phase contrast, fluorescence, scanning and transmission electron microscopes.

UNIT-V: PREPARATION OF MANUSCRIPTS

Preparation of index cards-Reference collection - preparation of thesis - preparation of Scientific paper for publication in a Journal. Internet and e-journals. Computer aided techniques for data analysis, data presentation and slide preparation.

REFERENCE BOOKS

1. Anderson, Durston and Polle.1970. Thesis and Assignment writing. Wiley Eastern Ltd., New Delhi.
2. Comir and Peter Wood Ford.1979. Writing scientific papers in English. Pitman Medical Publishing Co., London.
3. Ewing, G.W. 1988. Instrumental methods of chemical analysis, McGraw Hill Book Company.
4. Daniel, M. 1989. Basic biophysics for biologists. Agro-Botanical Publishers, India.
5. Skoog, A., Douglas, J. and Leary, J.J. 1992. Principles of Instrumental Analysis. Sanders Golden Sunberst Series, Philadelphia.
6. Day, R.A. 1994. How to write and publish a scientific paper. Cambridge University Press, London.
7. Palanichamy, S. and M. Shanmugavelu.1997. Research methods in biological sciences. Palani Paramount Publications, Tamil Nadu, India.
8. Wilson and Walker. 2000. Practical biochemistry - principles and techniques. Cambridge University Press.
9. Milton, J.S. 1992. Statistical methods in Biological and Health Sciences. McGraw Hill Inc., New York.
10. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.

11. Gurumani, N. 2006. Research Methodology for Biological Sciences. MJP Publishers, Chennai.
12. Veerakumari, L. 2006. Bioinstrumentation. MJP Publishers, Chennai.

PROJECT/DISSERTATION WITH *VIVA VOCE*

(For those choosing this Paper, the Main Practical 4: is compulsory)

Objectives

To promote original thinking, insemination of knowledge, modulation and innovation of thought, as an exercise, in order to transport the young minds to the expanding horizon of their chosen area of knowledge and transform them into knowledge generators.

Project / Dissertation	75 Marks
Viva voce	25 Marks

PAPER-11

EVOLUTION

(This Core Paper is compulsory for those not choosing Project / Dissertation with *Viva Voce*)

OBJECTIVES

To understanding the concepts of animal evolution through evidences, process and products.

UNIT-I: EVIDENCES

Evidences: The need of evidences for the fact of evolution - evidences from comparative anatomy, embryology, physiology and biochemistry - visual pigments, hemoglobin, protein sequences in phylogeny.

Biogeography, Platetectonics and continental drift - Evidences from systematic, evolutionary taxonomy - Evidences from paleontology - evolutionary trends in fossils, types of fossils. Process of fossilization - Evolution of homeotherms - Evidences from genetics - gene and chromosome homology, hybridization, universality of the genetic code.

UNIT-II: MECHANISM OF EVOLUTION

Mutationism - Views of De Vries and of R.B. Golschmidt; hopeful monsters. Inadequacies of mutationism.

Lamarckism - Life of Lamarck - Lamarckian postulates - inadequacies of Lamarckism.

Natural selection - In nature and laboratory - Creative aspects of natural selection - modern understanding of selection, stabilizing and diversifying and directional selection.

Adaptation - Nature and types of adaptation - Adaptive trends - Quantifying adaptation - Batesian and Mullerian mimicry and evolution.

Polymorphism - Transient and stable - Maintenance of polymorphism.

UNIT-III: GENETIC BASIS OF EVOLUTION AND SPECIATION

Mutations and their role in evolution - the neutralist hypothesis - population size and evolution - the role of genetic drift - hybridization and evolution - The role of polyploidy, isolating mechanisms - premating, post mating - problems of the origin of isolating mechanism.

Structure of species - Clones, peripheral population isolates,

Genetics and Ecology of speciations. Mayer's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation.

UNIT-IV: ORIGIN OF HIGHER TAXA - I

Definition Simpson's definition of the higher taxa - Evidence for the origin of higher taxa from living forms - Evidences for the origin of higher taxa from the fossil record.

Mechanisms in the origin of higher taxa Polyploidy - Deviation, Allometry - Carcinogenesis followed by neoteny.

UNIT-V: ORIGIN OF HIGHER TAXA - II

Modes of origin of higher taxa (1) Mosaic mode. Connecting links between vertebrate classes, (2) Quantum evolution. Simpson's adaptive grid.

Rate of evolution Horotely, Bradytely and Tachytely. Gradualism versus punctuated equilibrium - Extinction and its causes.

HUMAN EVOLUTION

Sociobiology Definition and scope - selfish gene, altruism and kin selection bioethics.

REFERENCE BOOKS

1. P.A.Moody. 1978. Introduction to Evolution. Harper International.
2. G.L. Stebbine. 1979. Process of Organic Evolution. Prentice Hall India, New Delhi.
3. E.O.Dodson. 1990. Evolution. Reinhold, New York.
4. D.S.Bendall. 1983. Evolution from molecules to man. Cambridge University Press.UK
5. M. Grene. 1983. Dimensions of Darwinism. Cambridge University Press. UK
6. E.C.Minkoff. 1984. Evolutionary Biology. Addison - Wesley. London.
7. Montagu. 1980. Sociobiology examined. Oxford University press.
8. Abraham, J.C.B. 1987. Evolution: A Laboratory Manual. Macmillan India Ltd., Madras.

PAPER-12

ENTOMOLOGY

OBJECTIVES

- To gain knowledge of insects.
- Economic importance of insects related to beneficial insects, sericulture, insect pests and their control and vector borne diseases.

UNIT-I: CLASSIFICATION

Classification of insects upto order with examples.

UNIT-II: BENEFICIAL INSECTS

Biology of honey bees, lac insects and their management.

UNIT-III: SERICULTURE

Prospects of sericulture, Biology of silkworm (Nutrition, Genetics, Endocrinology, Reproduction, Pest and Diseases).

UNIT-IV: INSECT PESTS AND THEIR CONTROL

Insects as crop pests: Types of injuries and loss caused to plants in general.
Factors governing the outbreak of pests.

Principles and methods of pest suppression: Natural, Cultural, mechanical, physical, chemical, Biological and Integrated pest management.

UNIT-V: INSECTS AS VECTORS

Vector borne diseases: Method of transmission of parasitic agents with special reference to mosquitoes and houseflies.

REFERENCES BOOKS

1. William S. Romoser and John G. Stoffolano.W. M.1994. The Science of Entomology C.Brown Publishers, England.
2. Yataro Tazima, Kodarsha .1978. The silkworm. An important laboratory tool. Scientific Book Ltd., Japan.
3. Ananthakrishnan, T.N. 2002. Insect Plant Interactions. Oxford and I.B.H, New Delhi.
4. P.G.Fenemore, Alkaprakash. 1992. Applied Entomology, Wiley Eastern Ltd., Delhi.
5. Nayar, K.K., Ananthakrishnan, T.N. and B.V.David. 1989. General and Applied Entomology. Tata McGraw Hill Publications, New Delhi.
6. Larry P.Pedigo. 1989. Entomology and Pest Mangement. Prentice Hall, New Jersey.
7. Metcalf, C.V. and Flint, W.P. 1979. Destructive and useful insects, their habitats and control. Tata McGraw Hill Publications, New Delhi.
8. Daniel Altman Robets. 1978. Fundamental of Plant Pest Control. C.R.S. Publishers and Distributors,Delhi,
9. Chapman, R.F.1988. The insect structure and Function. Cambridge University Press, U.K.
10. Richards, O.W. and Davies, R.G. 1997. Imm's General Text Book of Entomology Tenth Edition. Vol I and II. R.I Publications, New Delhi.
11. Rajeev K.Upadhyay, Mukerjii K.G. Chanda, B.P. and Dubey, O.P. 1998. Integrated Pest and Disease Management. APH Publishing Corporation, New Delhi.
12. David B.V., Muralirangan M.C. and Meera Murali Rangan. 1992. Harmful and Beneficial Insects. Popular Book Depot, Chennai.
13. Ramakrishna Ayyar T.V. 1989. Handbook of Economic Entomology for South India. Books and Periodicals Supply Service, New Delhi.
14. Frost S.W.1994. General Entomology. Narendra Publishing House, Delhi.
15. Dennis S.Hill. 1993. Agricultural Insect Pests of the Tropics and their Control. Second Edition, Cambridge University Press, U.K.
16. Saxena. A.B. 1996. Harmful Insects. Anmol Publications, New Delhi.
17. Patton. W.S. and Cragg F.W.1981. A Text Book of Medical Entomology. International Books and Periodicals Supply Service, New Delhi.
18. Rathinaswamy, T.K.1986. Medical Entomology. S.Viswanathan and Co., Madras.
19. Sundari, M.S.N. and Santhi, R. 2006. Entomology. MJP Publishers, Chennai.

ELECTIVE

PAPER -4

(to Choose either A or B)

A. SERICULTURE

OBJECTIVES

- To know the Biology of silkworm, their economic importance and methods in sericulture.
- To develop sericulture is a need based curriculum.

UNIT -I: ECONOMIC IMPORTANCE AND SILKWORM BIOLOGY

Prospects and status - Silk producing species - their distribution - *Bombyx mori* - life cycle - organization of larvae, pupae and moth - structure of the silk gland.

UNIT-II: MORICULTURE

Mulberry - varieties - distribution - methods of cultivation and preparation - Harvest - Transport and preservation of leaves. Feeding and nutrition - specificity of diet - Factors of nutrition - Diet and growth. Pest and diseases.

UNIT-III: SILKWORM REPRODUCTION AND GENETICS

Reproduction - Growth and Development of silkworms - Physiology of molting in different varieties (Uni, bi and multivoltine) - Endocrinology of reproduction and development. Genetics - mutation breeding and development of new strains.

UNIT-IV: PATHOGENIC DISEASES AND PEST

Pathology - Viral, bacterial, fungi and protozoan diseases - control mechanisms. Uzifly menace.

UNIT-V: SILKWORM REARING AND SILK REELING

Rearing operations - Selection and construction of rearing house Incubation - Hatching - brooding, Harvesting etc. Reeling techniques - lacing skinning. Re-reeling etc.

REFERENCE BOOKS

1. Ganga, G. and Sulochana Chetty, J. 1997.An Introduction to Sericulture. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Ganga, G. 2003. Comprehensive Sericulture Vol-II: Silkworm Rearing and Silk Reeling. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Hisao Aruga. 1994. Principles of Sericulture (Translated from Japanese).Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
4. Veda, K., Nagai, I. and Horikomi, M. 1997. Silkworm Rearing (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Otsuki, R. and Sato, S.1997. Silkworm Egg Production (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Eikichi Hiratsuka. 1999. Silkworm Breeding (Translated from Japanese). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Mahadevappa, D., Halliyal, V.G., Shankar, D.G. and Bhandiwad, R., 2000. Mulberry Silk Reeling Technology Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
8. Soo-Ho Lim, Young-Taek Kim, Sang-Poong Lee. 1990. Sericulture Training Manual - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
9. Wu Pang-Chuan and Chen Da-Chuang. 1994. Silkworm Rearing - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
10. Lu Yup-Lian and Liu-Fu-an. 1991. Silkworm Diseases - Published by FAO - USA. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

PAPER -4

B. MICROBIOLOGY

OBJECTIVES

- To acquire a basic knowledge of the microbes in general and of the environmental, medical and industrial important microbes in particular in order to have an integrated approach in biology.
- Also, to know the basics of sterilization and culture methods in microbiology.

UNIT-I: STRUCTURE AND CLASSIFICATION

Structure and classification of virus, bacteria and fungi.

UNIT-II: STERILIZATION AND CULTURE

Sterilization: Principles - dry heat, moist heat, filtration, Tantilization, pasteurization, Radiation - disinfection.

Culture techniques - media preparation - Aerobic and anaerobic culture techniques - Wet mount, hanging drop, Staining methods, dyes, simple differential and special staining techniques - acid fast stain, spore stain, capsule stain, staining for pure and mixed cultures.

UNIT-III: ENVIRONMENTAL MICROBIOLOGY

Microbial ecology, role of microorganisms in the productivity of ecosystems - Interactions between microorganisms and plants and animal. Microbiology of soil, water and air.

UNIT-IV: MEDICAL MICROBIOLOGY

Pathogenic microbes of bacterial, viral, fungal and protozoan diseases - cure, control and prevention. Antimicrobial chemotherapy - Antibiotics - Source - Classification Mode of action.

UNIT-V: INDUSTRIAL MICROBIOLOGY

Industrial microbiology - Industrial uses of microbes - fermentation products, bioconversions - bioremediation. Products of industrial microbiology - Penicillin, fuel ethanol, vinegar, vitamin B12, citric acid, glutamic acid, protease. Food and Dairy microbiology - Microbes in food - Role of microbes in food production. Dairy and non-dairy products - fermented foods and alcoholic beverages. Pharmaceuticals (antibiotics, vaccines etc.)

REFERENCE BOOKS

1. Tortora, G.J., Funke, R.B. and Case, C.L. 1992. Microbiology - An Introduction. The Benjamin / Cummings Publishing Co., Inc. Sydney.
2. Black, J.G. 1999. Microbiology - Principles and Explorations. John Wiley and Sons Inc. New York.
3. Atlas, R.M. 1995. Principles of Microbiology. Mosby - Year Book Inc.
4. Pelczer, M.J., Reid, R.D. and Chan, E.C.S. 1996. Microbiology. Tata McGraw Hill Co., Ltd. New Delhi.
5. Prescott L.M. Harley J.O. Klein D.A. 1990. Microbiology. WCB Publishers, Sydney.
6. Ananthanaryanan, T. and Paniker, J.C.K. 2000. Text Book of Microbiology Oriental Longman Ltd., Madras.
7. Ahmed, M. and Basumatary. S.K. 2006. Applied Microbiology. MJP Publishers, Chennai.

MAIN PRACTICAL 3

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

PHYSIOLOGY

1. Estimation of RQ in Fish with reference to Light and temperature.
2. Salt loss and salt gain in fish
3. Estimation of Proteins, Carbohydrates and Lipids in the tissues of Fish
4. Estimation of Blood Urea and Cholesterol.
5. Blood Clotting Time, Bleeding Time, Rouleaux Formation, Preparation of Haemin Crystal.
6. Principle and Application of Sphygmomanometer, Kymograph, Electrophoresis, Haemoglobinometer, ESR.
7. Estimation of Haemoglobin and ESR.

DEVELOPMENTAL BIOLOGY

1. Different stages in development - frog (egg, cleavage, Blastula, Yolk plug stage 24,48,72,96 h Gastrula)
2. Development of chick stage - slide showing C.S.of heart, kidney lens and limb.
3. Slides showing the uterine cycles in a mammal (Rat).
4. Study of slides showing of larval forms: Nauplius, Zoea, Bipinnaria, Leptocephalus.

IMMUNOLOGY

1. Haemagglutination - Quantitative analysis - haemagglutination titration.
2. Preparation of Antigen - RBC - Demonstration.
3. Ouchterlony technique - Demonstration.
4. Immunoelectrophoresis - Demonstration.
5. Slides showing T.S of Spleen, Thymus, lymphnodes and Bones

MAIN PRACTICAL 4

RESEARCH METHODOLOGY, EVOLUTION AND ENTOMOLOGY

RESEARCH METHODOLOGY

1. Problems relating to test of significance (Chi - square test and t - test)
2. Problems relating to correlation, regression and ANOVA.
3. Familiarization of biological and bioinformatics web sites.
4. BLAST search for similar nucleotide sequences.
5. Spectrophotometric estimation of any biological constituent.
6. Electrophoresis - Paper / Agarose gel / PAGE
7. Preparation of index and reference cards.

EVOLUTION (Slides / Specimens / Xerox)

1. Observation of forelimbs and hindlimbs of vertebrates (Frog, Calotes, Bird and Mammal) to study the common pattern of pentadactyl limb and common ancestry of vertebrates.
2. Observation of fossils to study paleontological evidences of evolution.
3. Observation of leaf insects and stick insects in the museum to study adaptation by cryptic colouration and natural selection.
4. Observation of Monarch and Viceroy butterflies to study Batesian mimicry.

ENTOMOLOGY

1. Study of morphology of an insect (local insects to be used).
2. Dissection of digestive, nervous, excretory, reproductive systems of any two insects of different orders.
3. Mounting of different types of mouthparts.
4. a. Field study to collect insect species

   b. Identification of at least 10 insects belonging to different orders.

5. a. Field study for various methods of pest management. b. Field visit to wearhouses and Plant protection centres.

ELECTIVE

PRACTICAL-2

(to choose either A or B)

A.SERICULTURE

1. Study of external morphology of silkworm moth, larvae and pupae.
2. Dissections of digestive and nervous systems in Bombyx mori larvae.
3. Mounting of Silk glands of Silkworm.
4. Study of silkworm rearing and reeling operations (Field visit)
5. Study of silkworm pathology: viral - bacterial - fungal diseases (Field visit - Slides/Specimens /Xerox)

ELECTIVE

PRACTICAL-2

B. MICROBIOLOGY

1. Microscopic observation and identification of microorganisms in Pond water.
2. Types of bacteriophage, bacteria, fungi and algae from the prepared slides / photographs from the book.
3. Collection and Identification of fungus: Bread mould and Coconut mould.
4. Identification of parasitic protozoans (e.g. Plasmodium, Entamoeba, Trypanosoma, Leishmania donovani)
5. Identification of bacteria - staining methods - Gram positive and Gram negative bacteria.
6. Demonstration

   a. Isolation of single colonies streak plate and serial dilution.

   b. Enumeration of microorganisms spread plate and pour platemethods.

   c. Preparation techniques of culture medium for bacterial growth

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ELECTIVE I SOFT SKILLS, LITERATURE AND MOVIES CODE 17P1EEN

UNIT I INTRAPERSONAL

Self – management, self – esteem, self-awareness, self- regulation, self – critique, Jane Eyre

UNIT II EMPATHY

Honesty, cultural diversity, ability to take other's point of view, integrating cognitive and affective skills, Nelli in "Wuthering Heights"

UNIT III INTERPERSONAL

Team work, persuasion, negotiation, conflict resolution, Reading social situations, learning to say no, active listening, Rosalind, Portia and Viola

UNIT IV COMMUNICATION

Body language, facial expression, humour, eye contact, tone of voice, etiquette

1. Antony and Cleopatra (Movie)
2. To Sir with Love (Movie)

UNIT V LEADERSHIP

Critical, lateral, strategic thinking, delegation, taking responsibility, giving praise and appreciation, giving and receiving feedback ability to motivate, problem solving in "Things Fall Apart" – Achebe.

ELECTIVE II **FILM STUDIES** **CODE 17P2E EN**

UNIT I

Introduction& Film Theories

A Brief History of Cinema, Important Film Movements, Trends & Film Theories-Auteur Theory, Gender film Theory, Formalist film Theory, Marxist film theory, Psychoanalytical, Film Theory, Genre studies.

UNIT II

Literature and Film

Language of film and fiction, Narratology in literature and cinema, Film and Theatre; Intertextuality ,Film and its interaction with other art forms.

UNIT III

Film as Text
Language of Films, Discourse Analysis of Films; Examining the ideology .

UNIT IV

Alternative Cinema
Queer cinema, Subaltern cinema, Documentary cinema, Third Cinema.

UNIT V

Indian Cinema
History of Indian Cinema, Post-LPG Indian , Cinema, Suppressed ,Discourses in Indian films, Subaltern New Cinema, Issues of communalism and secularism in films, Indian movie Stereotypes .

References

What is Cinema? –Andre Bazin, Concepts in Film Theory- Andrew, Dudley . Dr.Zhivago- Poris Pasternak Lolita- Stanley Koplins, Sergei Eisenstein-Battleship Potemkin, Jai Bheemarao - Anand Patwardhan Walter Salva-The Motorcycle Diaries.

MASTER OF COMMERCE (M.Com.)

(With effect from 2017-2018)

The Course of Study and the Scheme of Examination

S.NO.	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
	SEMESTR-I					**CIA**	**Exam**	**Total**
1	MAIN	Paper-1	6	5	Accounting for Managerial Decision	25	75	100
2	MAIN	Paper-2	6	5	Business Environment	25	75	100
3	MAIN	Paper-3	6	4	Advanced Business Statistics	25	75	100
4	MAIN	Paper-4	6	4	Modern Marketing Management	25	75	100
5	ELECTIVE	Paper-1	6	3	(to choose 1 out of 2) A. Computer Applications in Business B. Advanced Financial Management	25	75	100
			30	**21**		**125**	**375**	**500**
	SEMESTER II					**CIA**	**Exam**	**Total**
6	MAIN	Paper-5	5	4	Advanced Corporate Accounting	25	75	100
7	MAIN	Paper-6	6	4	Human Resource Management	25	75	100
8	MAIN	Paper-7	6	5	Quantitative Techniques for Business Decisions	25	75	100
9	MAIN	Paper-8	6	5	Consumer Behaviour	25	75	100
10	**Compulsory Paper**		2	2	**Human Rights**	25	75	100
11	ELECTIVE	Paper-2	5	3	(to choose 1 out of 2) A. E-commerce B. Bank Management	25	75	100
			30	**23**		**150**	**450**	**600**

S.NO.	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
SEMESTER III						**CIA**	**Exam**	**Total**
12	MAIN	Paper- 9	6	5	Advanced Cost Accounting - I	25	75	100
13	MAIN	Paper-10	6	5	Indirect Taxation	25	75	100
14	MAIN	Paper-11	6	5	Security Analysis and Portfolio Management	25	75	100
15	MAIN	Paper-12	6	5	Income Tax Law and Practice	25	75	100
16	ELECTIVE	Paper-3	6	3	(to choose 1 out of 2) A. Customer Relationship Management B. Services Marketing	25	75	100
			30	**23**		**125**	**375**	**500**
SEMESTER IV						**CIA**	**Exam**	**Total**
17	MAIN	Paper-13	6	5	Advanced Cost Accounting – II	25	75	100
18	MAIN	Paper-14	6	5	Research Methodology	25	75	100
19	MAIN	Paper-15	6	5	Total Quality Management	25	75	100
20	MAIN	Paper-16	6	5	Income Tax and Tax Planning	25	75	100
21	ELECTIVE	Paper-4	6	3	(to choose 1 out of 2) A. Logistics and Supply Chain Management B. Project	25	75	100
			30	**23**		**125**	**375**	**500**

Subject	Papers	Credit	Total Credits	Marks	Total marks
MAIN	16	4-5	76	100	1600
ELECTIVE	4	3	12	100	400
COMPULSORY PAPER	1	2	2	100	100
Total	**21**	**-**	**90**	**-**	**2100**

PAPER-2

BUSINESS ENVIRONMENT

UNIT-I

Business Environment**:** Cultural, social, political, technological, economic and legal environment - scanning - techniques of environmental forecasting - SWOT - Internal environment - their impact on policy formulation.

UNIT-II

Economic reforms in India - Liberalization - privatization and globalization - Competitive Strength of Indian industry - Impact of liberalization policy on different sectors - Foreign Investments policy in India.

UNIT-III

Multi-national corporations - Their participation in India - Their strategies, competitive strengths policies and performance.

UNIT-IV

Business policy and corporate strategy: Policies; Strategies and Tactics; Policies and procedures - Corporate strategy: alternatives - variations - Strategic choice, implementation.

UNIT-V

Business ethics and social responsibilities - relationship between business and society - Corporate power social accountability - Ethical issues and values in business - Corporate Social policies - issues and challenges - Ecological and sssenvironmental issues.

Reference Books

1. Wheelen, Concepts of Strategic Management and Business policy, 8th Ed. Pearson Education, New Delhi, 2002.

2. William Gluck & L R Jauch, Business Policy & Strategic Management,McGraw-Hill 2001.

3. Kazhmi Azhar , Business Policy, TMH,2002.

4. Gupta, Liberalisation - its impact on Indian Economy, Macmillan, 2002.

5.Business Environment ,Vijay Nichols,Chennai.

PAPER – 4

MODERN MARKETING MANAGEMENT

UNIT -1

Concept of Marketing: Evolution of Marketing Concept – Changing Concepts of Marketing – Role of Marketing in Business – Inter relationship between Marketing and Other functional areas – Marketing environment variables- Micro and Macro.

UNIT – 2

Market Segmentation – Market Segmentation Strategies – Target Marketing -Target market selection and strategies – Positioning – concept, bases and process- Consumerism – Consumer Rights – Consumer Protection Council – Functions.

UNIT – 3

Marketing mix – Product Decision – Product concept and Classification – Major Product decisions; New product Development – Pricing Decisions: Objectives of Pricing ;Factors affecting price of a product: procedure for setting price; Pricing Policies and strategies

UNIT-4

Distribution Decisions :Channels of Distribution – Concept and importance – Different types of distributions, middlemen and their functions. Promotion Decisions: Meaning and importance of Promotion; Communication process – Promotion tools and their Effectiveness; Determining optimal promotion Mix; Promoting through internet

UNIT – 5

Recent Trends in Marketing – Viral Marketing – Customer Relationship Marketing – Green Marketing – Online Marketing – Rural Marketing – Impact of Multi – nationals on retail marketing.

Reference Books

1.Stanton W.J.et.al.,-Fundamentals of Marketing ,McGraw Hill,New York,1991

2.Philip Kotler ,Marketing Management – Analysis Planning ,and Control ,Prentice Hall of India ,New Delhi,1996.

3.Ramaswami and Namakumari – Marketing Management – Analysis,Planning ,and Control,Prentice Hall of India,New Delhi,1996,

4.Christopher Lovelock ,Services Marketing,4th Edition,Pearson Education ,New Delhi,2002.

5.C.B Mamoria and R.K.Suri Marketing Management ,Kitab Mahal,New delhi,2003

ELECTIVE PAPER-1

A. COMPUTER APPLICATIONS IN BUSINESS

Objective:

To make the students to understand the importance of computers in business applications and learn the fundamental aspects of hardware and software components

Unit -1

Computer: Characteristics, Advantages, Limitations, Types and applications. Role of information in business - Types of information and information systems; Users of information system and information technology - Limitations of Information Technology.

Unit –2

Utility Software – Virus, Worms and antivirus software: System Software: Operating system - Overview, Functions of OS, Types of OS and their advantages and disadvantages.

Unit – 3

Spreadsheet: Basic Operations; Formula Copying, Moving data from selected cells, Handling operations in formulae, Rearranging Worksheet. Organizing Charts and graphs, Graphical representation of data.

Unit – 4

Growth of internet, Owner of Internet, Anatomy of Internet, Basic Internet Terminology, Net Etiquette, World Wide Web, Internet Protocols, Usage of Internet to society, Search Engines.

Unit – 5

E-Commerce: Introduction, Business Models for E-Commerce; E-Marketing: Online Marketing, E-Advertising, Marketing Analysis and issues; E-Payment System: Fundamentals

Text Book:

- Leon, (2006), Introduction to computers, Vikas Publishing House Pvt. Ltd., New Delhi.
- Alexis Leon and Mathew Leon, (2005), Introduction to computers with Ms Office 2000, TMH, New Delhi.

Reference Books:

- SrinivasaVallaban SV, (2005), Computers in Business, Sultan Chand and Sons, New Delhi.
- Sanjay Saxena, (2005), MS Office for Everyone, Vikas Publishing House Pvt Ltd, New Delhi.

Note: Latest Edition of Text Books may be used.

ELECTIVE PAPER-2

A .E-Commerce

Objective:

To provide technical knowledge about the applications of E-Banking and E-Commerce

Unit I:

E-Commerce - Concept - Elements - E-Commerce in Indian Scenario - Economic potential of E-Commerce - M-Commerce - Implementation of E-Commerce - Creation of Website - Technology - Constraints in Implementation - Advantages of E-Commerce - Business models of E-Commerce - B2B, B2C, C2B, G2B and E-Governance.

Unit II:

Evolution of Internet - Growth - Internet Governance - Dynamics of Internet Banking - Internet Portals - a new way to Bank - Net Telephony - Advertisement and Marketing through Internet – Banking Management Information System - importance – Difference between Drive Protection system and Management information System.

Unit III:

Electronic Cheques and Other E-Payment Channels - Banking network in online commerce - Electronic Cheques, Cash, Purse, Electronic Credit - Smart Cards - SWIFT – Operational Risks and Legal Issues with Electronic cash.

Unit IV:

Security Aspects of E-Banking - Physical Vs Electronic security - Data security - Cryptography - Key Secrecy - Digital Signature - Creation and Security - Firewall - Types.

Unit V:

Model of E-Commerce for Implementation in a Public Sector Banks - Level of Computerization of Banks - Challenges before Public Sector Banks - Impact of Technology in Banking Sector - Proposed Model of E-Commerce for Implementation in a Public Sector Banks.

Reference Books:

Bhasin T.M. Tarun Offset, Delhi, Reprint – 2013

Dr. K. Abirami Devi and Dr. M. Alagammai - E- Commerce - Margham Publications, Chennai. Reprint 2016

PAPER-11

SECURTIY ANALYSIS AND PORTFOLIO MANAGEMENT

Unit-I

Investments: Nature, Scope, Avenues And Elements of Investment, Approaches to Investment Analysis; Tax and Transactions Cost in Investment, Financial Assets: Types, Characteristics and Alternatives; Sources of Financial Information.

Unit-II

Security Markets: Secondary and Primary, Public Issue: IPO and other types of issues in securities in India. Participants in the securities market; Stock-Market: - Stock-Exchanges, Trading and Settlement, Stock market quotations and Issues; SEBI and Future challenges in the settlement of securities market, SEBI guidelines in primary and secondary capital markets.

Unit-III

Intermediaries in the capital markets (including Depositories); Valuation of Debt and Equity instruments (with numericals); Valuation of Options and Futures.

Unit-IV

Fundamental analysis (Industry, Company and Macroeconomic analysis); Technical analysis (Charting techniques, Dow-theory, Moving average analysis, Moving average convergence divergence(MACD); Relative strength analysis, Technical indicators of Breadth, sentiments), Testing technical trading rules, Evaluation of Technical Analysis.

Unit-V

Portfolio performance evaluvation – Risk adjustment – Measures of Returns – Stratergies of the Great Masters.

Reference Books:-

1. Ranganatham, M. and Madhumati, R.”Investment Analysis and Portfolio Management”, Pearson education. Delhi-92.

2. Jordon, Fisher,” Security Analysis and Portfolio Management”, 6th Ed. Phi-New Delhi-110001.

3. Bodie, kane, Marcus and Mohanty, “Investments”. TMH New-Delhi.

4. Chandra, P. “Investment Analysis and Portfolio Management”. CFM-Mc Graw Hill professional series in finance. 4th Ed.

ELECTIVE

PAPER - 4

A. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

OBJECTIVE

To understand the comprehensive nature of Logistics Management

UNIT I

Fundamentals of Logistics - Definition and Activities - Aims and importance - Progress in Logistics and Current trends - Organization and achieving integration.

UNIT II

Logistics Strategy - Implementing the Strategy - Locating Facilities - Planning Resources – Controlling Material Flow.

UNIT III

Procurement - Inventory Management - Warehousing and Material Handling – Transport – Global Logistics

UNIT IV

Basic Concepts of Supply Chain Management - Planning and Sourcing - Making and Delivering – Returns - IT and Supply Chain Management

UNIT V

Financial Supply Chain - Elements of Financial Supply Chain Management - The Evolution of e- Financial Supply Chain - E-Financial Supply Chain' (Banks Perspective) - Legal Aspects of e Financial Supply Chain

Reference Books

1. Waters Donald, Logistics: Introduction to Supply Chain Management, Palgrve Macmillan.
2. Christopher Martin, Logistic and Supply Chain Management: Creating Value- Adding Networks, PT Prentice Hall.
3. Dalmia Sanjay, Financial Supply Chain Management, McGraw Hill Publishing Co Pvt.Ltd.

MUTHURANGAM GOVERNMENT ARTS COLLEGE

(AUTONOMOUS)

VELLORE - 632002

MASTER OF PHILOSOPHY

M.Phil TAMIL (FULL TIME & PART TIME)

SYLLABUS

UNDER CBCS

(with effect from 2017-2018)

MUTHURANGAM GOVERNMENT ARTS COLLEGE(AUTONOMOUS)

VELLORE-632002

MASTER OF PHILOSOPHY

M.Phil TAMIL (FULL TIME & PART TIME)

DEGREE COURSE

SYLLABUS

UNDER CBCS

(with effect from 2017-2018)

The course of study and the scheme of examinations

Semester	Subject	Paper	Subject code	Title of the Paper	Credit	Exam Hrs	Max. Marks		Total
							IA	Univ Exam	
I SEM	Core Theory-I	1	17MTA1	ஆராய்ச்சி நெறிமுறைகள்	5	3	25	75	100
	Core Theory-II	2	17MTA2	தமிழ் ஆராய்ச்சி வரலாறு	5	3	25	75	100
	Guide Paper Elective-1	1	17ME-TA1	தமிழர் நாகரிகமும் பண்பாடும்	5	3	25	75	100
II SEM	Dissertation and Viva-Voce	1	17MTAD	ஆய்வுத் தலைப்பு (Title of the dissertation)	21	-	-	-	100
					36	09	75	225	400

தாள்-1

17MTA1 - ஆராய்ச்சி நெறிமுறைகள்

அலகு-1 : ஆய்வியல் - அறிமுகம் - ஆய்வின் இலக்கணம் - ஆய்வுப் பொருள் - ஆய்வாளர் பண்புகள் - ஆய்வு முறைகள் - தலைப்புத் தேர்வுகள் - தலைப்புப் பண்புகள் - உத்திகள் - வகைகள் - உள்ளடக்கம் - வகை - வகைமை.

அலகு-2 : ஆய்வுத்திட்டமிடல் - கருதுகோள்கள் - செய்திகள் - கொள்கை – வகைகள் - ஆய்வின் வகைப்பாடுகள் - கோட்பாட்டாய்வு – வகைப்படுத்துதல் ஆய்வு – பொருத்திக்காட்டல் ஆய்வு – அணுகுமுறை.

அலகு-3 : ஆய்வு நெறிமுறைகள் - தகவல் திரட்டுதல் - தரவு திரட்டுவதற்குரிய மூலங்களைக் கண்டறிதல் - தரவுகளைத் தொகுத்தல் - குறிப்பெடுக்கும் முறை – வகைப்படுத்தும் முறை – அடிக்குறிப்பு – மேற்கோளாட்சி – நேர்காணல் - வினாநிரல் - கள ஆய்வு.

அலகு-4 : ஆய்வேட்டின் அமைப்பும் வரைவுமுறையும் - திட்டமிடுதல் - இயல் வகுத்தல் - உட்பிரிவுகள் - முன்னுரை – முடிவுரை – ஆய்வு மொழிநடை – நிறுத்தக் குறியீட்டு ஆட்சி – பிழையின்மை – எளிமை – தெளிவு – மேடைப்பேச்சு நடைமுறை விலக்கல் - சொல்லடுக்கு பொருளடுக்குகளை விலக்கல் - குறுக்க விளக்கம் - துணைநூற் பட்டியல் - பின்னிணைப்புகள் - படங்கள் - அட்டவணைகள் - பொருட்குறிப்பு – அகராதி.

அலகு-5 : தமிழாய்வுப் பரப்பு - இலக்கிய ஆய்வு – ஒப்பிலக்கிய ஆய்வு - இலக்கிய வரலாற்று ஆய்வு – நாட்டுப்புறவியல் ஆய்வு - இலக்கண ஆய்வு – மொழி வரலாற்று ஆய்வு – அகராதி ஆக்கம் - தமிழியலும் மொழியலும் - தமிழியலும் தத்துவமும் - தமிழியலும் பண்பாட்டியலும் - தமிழியலும் நுண்கலைகளும் - தமிழியலும் தொல்பொருள் ஆய்வியலும்.

பார்வை நூல்கள்:

1. ஆய்வியல் அறிமுகம் - டாக்டர் தமிழண்ணல்,
டாக்டர் இலக்குமணன்,
மீனாட்சி நிலையம் ,
மதுரை – 1977.

2. ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் ச.வே. சுப்பிரமணியன்(ப.ஆ.,),
உலகத் தமிழாராய்ச்சி நிறுவனம் ,
சென்னை – 1975.

3. ஆய்வு நெறிமுறைகள் - டாக்டர் ஈ.சா. விசுவநாதன் ,
சென்னை – 1975.

4. இலக்கிய ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் முத்துச் சண்முகம்,
டாக்டர் சு. வேங்கடராமன் ,
முத்துப் பதிப்பகம் ,
மதுரை – 1975.

5. ஆராய்ச்சி நெறிமுறைகள் - டாக்டர் பொற்கோ,
ஐந்திணைப் பதிப்பகம் ,
திருவல்லிக்கேணி,
சென்னை – 1995.

தாள்-2

17MTA2 - தமிழ் ஆராய்ச்சி வரலாறு

அலகு -1 : தமிழியல் ஆராய்ச்சி வரலாறு - அறிமுகம் - மறைந்துபோன நூற்கள் - வெளிவந்துள்ள தமிழியல் ஆராய்ச்சி குறித்த நூல்கள் - மரபுவழிபட்ட தமிழியல் ஆய்வு - தொல்காப்பியக் காலத்திற்கு முற்பட்ட ஆய்வு - தொல்காப்பியக்கால ஆய்வு.

அலகு -2 : சங்ககால ஆய்வுகள் - இலக்கிய உருவாக்கம் - தொகுப்பு முறைகள் உருவாக்கம் - திருவள்ளுவரும் அவருக்கு முற்பட்ட, பிற்பட்ட நீதி நூல்கள் உருவாக்கம் - சமய நூல்கள் உருவாக்கம் - சூழல் - மத செல்வாக்கும் தமிழியல் தொடர்பான இலக்கண இலக்கிய உருவாக்க வரலாறும் - கால ஆய்வு.

அலகு -3 : காப்பியங்கள் - காப்பிய உருவாக்கம் - இளங்கோ அடிகளும் அவருக்கு முற்பட்ட, பிற்பட்ட காப்பிய படைப்பு வரலாறு – ஆய்வுகள் - சிறுகாப்பிய அமைப்புகள் - சமய செல்வாக்கு – சமய ஆய்வு – கால ஆய்வு.

அலகு -4 : உரைநூல்கள் உருவாக்கம் - இலக்கண - இலக்கிய உரைநூற்கள் - உரையாசிரியர்கள் ஆய்வுமுறை சிந்தனைகண்டு மீட்டுருவாக்கம் செய்தல் - ஒப்புமைப் பகுதிகளைக் கண்டுகூறுதல் - அகராதிகள் நிகண்டுகள் உருவாக்கம் - சிற்றிலக்கிய மீட்டுருவாக்கம் - சிற்றிலக்கிய ஆய்வுகள் - கால ஆய்வு.

அலகு -5 : இக்காலத் தமிழியல் ஆய்வு – புனைகதை ஆய்வுகள் (நாவல், சிறுகதை) – கவிதை ஆய்வுகள் - நாடக ஆய்வுகள் - நாட்டுப்புறவியல் ஆய்வுகள் - மொழியியல் ஆய்வுகள் - 20 ஆம் நூற்றாண்டில் உருவான புதிய கருத்தோட்டங்கள் வழி உருப்பெற்ற ஆய்வுகள் - நிறுவனமயப்பட்ட ஆய்வுகள் - தமிழ் இலக்கிய ஆய்வுகள் - கால ஆய்வு.

பார்வை நூல்கள்:

1. தொல்காப்பிய ஆராய்ச்சி - பேரா. சி. இலக்குவனார் , வள்ளுவர் பதிப்பகம் , புதுக்கோட்டை – 1991.

2. தொல்காப்பியக் கடல் - டாக்டர் வ.சுப. மாணிக்கம் , மணிவாசகர் பதிப்பகம், சிதம்பரம் - 2002.

3. தமிழ் ஆராய்ச்சியின் வளர்ச்சி - ஏ.வி. சுப்பிரமணி அய்யர் , அமுத நிலையம் பிரைவேட் லிட், சென்னை – 1959.

4. இலக்கணச் சிந்தனைகள் - எஸ். வையாபுரிப் பிள்ளை, பாரி நிலையம், சென்னை – 1956.

5. தற்காலத் தமிழ் இலக்கியம் - ஏ.வி. சுப்பிரமணி அய்யர், மக்கள் வெளியீடு, சென்னை.

6. தற்காலத் தமிழ் இலக்கியம் - டாக்டர். ரா. தண்டாயுதம் , தமிழ்ப் புத்தகாலயம், சென்னை – 1973.

7. தமிழ் உரைநடை - மு. அருணாசலம் , தினமணி வெளியீடு.

8. இலக்கண வரலாறு - ஆ. வேலுப்பிள்ளை.

9. தொகுப்புக்கலை - சுந்தர சண்முகனார்.

10. உரையாசிரியர்கள் - மு. வை. அரவிந்தன்.

11. பண்டைத் தமிழர்வாழ்வும் வழிபாடும் - க. கைலாசபதி.

12. தமிழ் அகராதிக்கலையின் வளர்ச்சி வரலாறு – வ. ஜெயதேவன்.

13. பாட்டியல் நூல்கள் - சு. அரங்கராசன்.

14. காவியகாலம் - எஸ். வையாபுரிப் பிள்ளை.

15. பக்தி இலக்கியம் - ப. அருணாசலம்.

தாள்-3

17ME-TA1- தமிழர் நாகரிகமும் பண்பாடும்

அலகு-1 : நாகரிகமும் பண்பாடும் - சங்க காலத்து அரசியல் நிலை - சங்க காலப் போர் முறை - சங்க காலத் தொழிற்பிரிவினரும் சமூக அமைப்பும் - பண்டைத் தமிழரின் திருமண முறை - குடும்ப வாழ்வு பற்றிய தமிழர் கொள்கை - தமிழ்நாட்டு வணிக வளம் - பண்டைத் தமிழரின் உணவு, உடை, உறையுள் -இறப்பு, ஈமச்சடங்கு நடுகல், தென்புலத்தார்கடன்.

அலகு-2 : பண்டைத் தமிழரின் கல்வி நிலை - பண்டைத் தமிழரின் வானியல் அறிவு - பண்டைத் தமிழரின் விளையாட்டும் பொழுதுபோக்கும் - சங்கத் தமிழரின் சமய வாழ்வு - ஆரிய வேள்வி நெறி - சங்க கால விழாக்கள் - சங்கப் புலவர் பண்பாடு - பழந்தமிழரின் நம்பிக்கைகள் - தமிழர் கண்ட நல்லறம்.

அலகு-3 :இசைக்கலையின் வரலாறு - தமிழகச் சிற்பக்கலை - தில்லைக் கூத்தனின் திருநடனம் - தமிழகக்கோயில் கட்டிடக்கலை வளர்ச்சி - ஓவியக்கலை - கூத்துக்கலை - மருத்துவக்கலை - நாடகக்கலை.

அலகு-4 : சைவ சமயம் - தமிழ்ப் பண்பாட்டில் வைணவம் - தமிழ்ப் பண்பாட்டில் சமணம் - தமிழ்ப் பண்பாட்டில் பௌத்தம் - தமிழ்ப் பண்பாட்டில் இசுலாம் சமயம் - நீதித்துறையின் வரலாறு - இடைக்காலக் கோயில்களின் பணிகள் - தமிழ்நாட்டரசியலில் வரிகள் - தமிழகக் காசுகளின் வரலாறு - உள்ளாட்சி மன்றங்களின் வரலாறு - இடைக்காலத் தொழிற் சங்கங்கள்.

அலகு-5 : சங்ககாலத்திற்குப்பின் சாதிகளின் வளர்ச்சி - சாதியொழிப்பு முயற்சிகள் - மகளிர் நிலை - மார்க்கோபோலோ கண்ட பாண்டிய நாட்டு நிலை -இந்திய நாகரிகத்தில் தமிழ்ப் பண்பாட்டுக் கூறுகள் - தமிழ்ப் பண்பாட்டில் ஆங்கில ஆட்சியின் செல்வாக்கு - மராட்டியர் செய்த நன்மைகள் - வாய்மொழி இலக்கியங்களும் தமிழ்ப் பண்பாடும் - பழமொழியும் பண்பாடும் - சமயப் பொதுநோக்கு - பண்பாட்டு ஊடாட்டம்.

பார்வை நூல்கள்:

1. தமிழர் நாகரிகமும் பண்பாடும் - டாக்டர் அ. தட்சிணாமூர்த்தி.
2. தமிழர் பண்பாடும் அதன் சிறப்பியல்புகளும் - தனிநாயகம் அடிகள்.
3. தமிழர் வரலாறும் பண்பாடும் - சி. மௌனகுரு.
4. தமிழ்ப் பண்பாடு - முனைவர் த.அருள்பத்மராசன்.
5. தமிழக வரலாறும் மக்களும் பண்பாடும் - டாக்டர் கே.கே. பிள்ளை.
6. தமிழர் நாகரிகமும் பண்பாடும் - டாக்டர் மா.ரா. ராசமாணிக்கனார்.
7. எட்டுத்தொகையும் தமிழர் பண்பாடும் - சாமி . சிதம்பரனார்.
8. பத்துப்பாட்டும் தமிழர் பண்பாடும் - சாமி . சிதம்பரனார்.
9. தமிழர் வாழ்வியல் - டாக்டர் சி.இலக்குவனார்.
10. சங்ககாலத் தமிழர் வாழ்வு - லெ.ப. கரு. ராமநாதன் செட்டியார்.
11. தமிழர் நாகரிகமும் பண்பாடும் - ஞா. தேவநேயன்.
12. சமுதாயமும் பண்பாடும் - அ.மு. பரமசிவானந்தம்.
13. தமிழக வரலாறும் பண்பாடும் - வே.தி. செல்லம்.
14. தமிழர் சால்பு - டாக்டர் சு. வித்தியாநந்தன்.

M.Phil. தமிழ் - பருவ முறை

வினா பகிர்வு

மொத்த மதிப்பெண் : 75

அலகு வரிசை	பகுதி - 1		பகுதி - 2	
	வினா எண்ணிக்கை	மதிப்பெண்	வினா எண்ணிக்கை	மதிப்பெண்
அலகு 1	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 2	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 3	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 4	2 A (அ) B	1 x 6 = 6	1	1x15=15
அலகு 5	2 A (அ) B	1 x 6 = 6	1	1x15=15
		5 x 6 = 30		3x15=45

(பகுதி - 1 = 30) - (பகுதி - 2 = 45) = 75

M.PHIL. HISTORY

17MHS1

(FT/PT)

PART I

CORE PAPER I

RESEARCH METHODOLOGY AND THESIS WRITING

UNIT-I:

Meaning of Research - Types of Research - Science and its method - Social and its method - Social Science as science - New science and new social science.

UNIT-II:

Impact of Science on Historical Method - History as Social Science - Interdisciplinary approach to History.

UNIT-III:

Philosophy and Hermeneutics - Phenomenology - Historical Method - Objectivity - Subjectivity - Causation in History

UNIT-IV:

Combining Qualitative and Quantitative Method in Social Inquiry - De-construction as a Method of Research - From Hermeneutics to Post structuralism to Psychoanalysis - Feminism / Post structuralism - The Foundations of Experimental/Empirical Research Methods - The Positivist Paradigm in Contemporary Social Science Research - Introduction to Quantitative Methods.

UNIT-V:

Thesis writing: Choosing a Research topic - Data collection - Sources - Secondary & Primary - Internal and External criticism. Analytical and Synthetic operations - Documentation - Footnotes - Bibliography - Tables and Charts - Writing.

REFERENCES:

1. Bridget Somekh and Cathy Lewin, *Research Methods in the Social Sciences,* (New Delhi: Vistaar Publications, 2005).
2. Floud, Roderick.(1983) *An Introduction to Quantitative Methods for Historians,* London: Methuen (R.P).
3. Malcolm Williams, *Science and Social Science: An Introduction,* (London and New York: Routledge, 2000).
4. Martin Hollis, *The Philosophy of Social Science: An Introduction,* (New Delhi: Cambridge University Press, 2000).
5. *M.L.A. Hand Book for Researchers Thesis & Assignment Writing* (1990) New Delhi: Wily Eastern.
6. Topolski, Jerzy (1976) *Methodology of History,* Holland: Reidal Publishing Co.
7. Watson, George (1987) *Writing a thesis: A Guide to Long Essays and Dissertations,* Longman, London.

PART I

CORE COURSE II

17M HS2

HISTORIOGRAPHY

HISTORIOGRAPHY

UNIT-I

The Idea of History - Enlarging Scope of History - Definition of History and Historiography - History: Nature, Scope and Value - Social necessity of History - Philosophy of History.

UNIT-II

Evolution of the discipline of History: Greco-Roman History - Church Historiography - Medieval Arab Historiography: Ibn Khaldun - Enlightenment Historiography.

UNIT-III

French Historiography: Annales and Mentalities - British Marxist Historians - Evolution of Quantitative History in France and U.S.A. (Cliometrics) - Prosopography - Impact of Modernism (Namier) - Structuralism (Claude Levi Straus) and Postmodernism (Michel Foucault, Jacques Derrida).

UNIT-IV

Ancient Indian Historiographers: Bana, Kalhana - Mediaeval Indian Hisoriography: Alberuni, Barani - Western Indologists: James Mill, A.L. Basham - Vincent Arthur Smith - Indian Historians: K.P. Jayaswal, R.C. Dutt, J.N. Sarkar, D.D. Kosambi, R.S. Sharma.

UNIT-V

South Indian Historians: K.A. Nilakanta Sastri, K.K. Pillai

REFERENCES

E.H. Carr, *What is History?*, (Harmondsworth 1977)

R.G. Jones, "History the Poverty of Empiricism", in Robin Blackburn ed., *Ideology in Social Science* (Fontana, 1972)

R.G. Collingwood, *The idea of History* (Oxford 1977), Parts III, IV, V.

E.J. Hobsbawn, *Karl Marx's Contribution to Historiography in Ideology and Social Science* (Suffolk 1972)

Harvey Kay, *The British Marxist Historians* (Polity)

Stein, Burton, *History of India*, Oxford: Basil Blackwell, 1998

Champakalakshmi, R. *Trade, Jdeology and Urbanization: South India 300 B.C to A.D 1300*, New Delhi: Oxford University Press, 1996.

Romila Thapar, *From Lineage to State: Social Formations in the Mid-First Millenium B.C* New Delhi: Oxford University Press, 1984.

Sharma, Ram Sharan, *Indian Feudalism*, Madras: Macmillian India Ltd, 1965

"Theories of Nationalism and Cambridge Historiography" National Seminar on Historiography of Tamil Nadu jointly sponsored by the Department of Indian History, University of Madras and I.C.H.R southern region, Banglore, 28 & 29 March, 2001.

S. Clark, 'The Annales Historians', in Q. Skinner, (ed.), *The Return of Grand Theory in the Human Sciences*, (Cambridge 1985).

Journal of Modern History, 1972, Special No. on Annales.

Manickam S. (1977) *Theory of History & Method of Research*, Paduman Pub., Madurai Maurice Aymard and Harbans Mukhia, (eds.), *French Studies in History*, (New Delhi, 1988).

Marc Bloch, *The Historian's Craft*, (New York 1953).

Le Roy Ladurie, "The Event and the 'Long Term' on Social History" in the *Territory of the Historian.*

Ali, Sheik, (1980) History: *Its Theory and Methods*, New Delhi: MacMillan.

Floud, Roderick.(1983) *An Introduction to Quantitative Methods for Historians*, London: Methuen(R.P).

Guha, Ranajit (1994) *Subaltern Studies Vol.I, IV and VI*. Delhi: OUP.

Marwick, Aurther. (1984). *The Nature of History*. Hong Kong: Macmillan (Reprint).

M.L.A. Hand Book for Researchers Thesis & Assignment Writing (1990) New Delhi: Wily Eastern.

Stern, Fritz, (1973) *Varities of History*, New York: Vintage Books.

Stone, Lawrence, (1983) *The Past and the Present*. Boston: Routledge & Kegan Paul.

Topolski, Jerzy (1976) *Methodology of History*. Holland: Reidal Publishing Co.

Watson, George (1987) *Writing a thesis: A Guide to Long Essays and Dissertations*. Longman, London.

17MEHS

HISTORY OF TAMIL NADU A.D. 1900 – 1977

UNIT –I Theosophical Society – Home Rule Movement – Justice Party.

Unit – II Trade Union Movement – E.V.R – Self Respect Movement.

Unit – III Congress (1937 – 1967) – Sathyamoorthy – Kamaraj – Rajaji.

Unit – IV Emergence of DMK – C.N. Annadurai – M. Karunanithi – Socio – Economic Development.

Unit – V Tamilnadu in Freedom Struggle – Education in Tamilnadu – Film and Politics.

References :

1) V.T. Chellam : Thamizhaga Varalarum Panpadum.

2) K.K. Pillai : A Social History of the Tamils.

3) P.Rajaraman : The Justice Party.

4) P.Subramanian : Social History of Tamils.

Muthurangam Government Arts College (A) - Vellore

M.Sc. FOODS AND NUTRITION

DEGREE COURSE

CBCS PATTERN

(With effect from 2018-2019)

The Course of Study and the Scheme of Examinations

S. NO	Study Components		Ins. hrs/ Week	Credit	Title of the paper	Maximum Marks		
	Course Title							
SEMESTER I						**CIA**	**Exam**	**Marks**
1	MAIN	Paper-1	5	4	Applied Physiology	25	75	100
2	MAIN	Paper-2	5	4	Advanced Food Science	25	75	100
3	MAIN	Paper-3	5	4	Nutrition for Health	25	75	100
4	MAIN	Paper-4	4	4	Food Microbiology	25	75	100
5	MAIN PRACTICAL	Practical –I	6	4	Advanced Food Science & Nutrition for Health	25	75	100
6	ELECTIVE I	Paper-1	5	3	Functional Foods and Nutraceuticals	25	75	100
			30	**23**		**150**	**450**	**600**
SEMESTER II						**CIA**	**Exam**	**Marks**
7	MAIN	Paper-5	6	5	Advanced Nutrition I	25	75	100
8	MAIN	Paper-6	6	5	Advanced Nutrition II	25	75	100
9	MAIN	Paper-7	5	4	Research Methodology and statistics	25	75	100
10	MAIN PRACTICAL	Practical -II	6	4	Food Analysis	25	75	100

11	ELECTIVE II	Paper-2	5	3	Nutrigenomics	25	75	100
12	COMPULSORY PAPER		2	2	Human Rights	25	75	100
			30	**23**		**175**	**525**	**600**
SEMESTER III						**CIA**	**Exam**	**Marks**
13	MAIN	Paper-8	6	5	Diet Therapy-1	25	75	100
14	MAIN	Paper-9	6	5	Diet Therapy -2	25	75	100
15	MAIN	Paper-10	6	5	Biochemical basis of Nutrition	25	75	100
16	MAIN PRACTICAL	Practical-3	6	4	Diet Therapy -1 &2	25	75	100
17	ELECTIVE III	Paper-3	5	3	Food Processing and Preservation	25	75	100
18	VIVA VOICE			2	Internship	25	75	100
19	DEMONSTRATION		1		Journal Club			
			30	**24**		**150**	**450**	**600**
SEMESTER IV						**CIA**	**Exam**	**Marks**
20	MAIN	Paper-11	6	5	Community and Public Health Nutrition	25	75	100
21	MAIN	Paper-12	5	4	Food Standards and Quality Control	25	75	100
22	ELECTIVE-IV	Paper-4	5	3	Food Biotechnology	25	75	100
23	MAIN PRACTICAL-IV	Practical-4	6	4	Nutritional Assessment And Diet Counseling	25	75	100
24	PROJECT/ DISSERTATION		8	4		25	75	100
			30	**20**		**125**	**375**	**500**

S.NO	SUBJECT	PAPERS	CREDITS	TOTAL CREDITS	MARKS	TOTAL MARKS
1	MAIN PAPER	12	4-5	54	100	1200
2	MAIN PRACTICAL	4	4	16	100	400
3	INTERNSHIP	1	2	2	100	100
4	DISSERTATION	1	4	4	100	100
5	ELECTIVE	4	3	12	100	400
6	COMPULSORY PAPER	1	2	2	100	100
	Total	**23**		**90**		**2300**

MUTHURANGAM GOVERNMENT ARTS COLLEGE (A)-VELLORE

M.Sc. FOODS AND NUTRITION

SYLLABUS UNDER CBCS

(With effect from 2018-2019)

SEMESTER I

PAPER – 1 APPLIED PHYSIOLOGY

OBJECTIVES

Enable the Students :

To understand the general structure and functions of various systems and organs of our body.

To understand the abnormal changes in tissues and organs in diseased condition.

UNIT-I CELLULAR BASIS OF PHYSIOLOGY

Body fluid compartment, Membrane potential, Inter cellular communication - Homeostasis. Biochemical aspects of muscle tissue - structure, chemical composition, Mechanism and energetic of muscle contraction, muscle fatigue.

UNIT-II CIRCULATORY AND GASTRO INTESTINAL SYSTEM

Blood - composition, functions of formed elements of blood and plasma proteins, Anatomy and physiology of heart , origin and conduction of heart beat, ECG-interpretation, Latest development in cardiac condition, cardio vascular mechanism and homeostasis.

Anatomy and physiology of gastrointestinal tract, movement of intestine. Mechanism of secretion of gastric juice. Hunger, Appetite, Satiety - physiological and psychological factors affecting food intake, Circadian rhythm GI tract secretions.

UNIT-III RESPIRATORY AND EXCRETORY SYSTEM

Oxygen requirement for nutrients, composition of inspired and expired gas, partial pressure of gas, diffusion gradient and gas flow, transport of oxygen and CO_2, Haemoglobin affinity for O_2 and dissociation.

Excretion - formation of urine, characteristics of urine, normal and abnormal constituents of urine, acid - base balance .

UNIT-IV NERVOUS SYSTEM AND IMMUNITY

Nervous system – Anatomy and physiology of brain , spinal cord and neuron(briefly), conduction of nerve impulses, role of neurotransmitters; blood brain barriers, Cerebrospinal fluid, hypothalamus and its role in various body functions.

Immunity - Properties, natural and acquired Immunity, features of immune responses, antigen - antibodies - types, properties, and mechanism, Auto immune disorder and allergy (review).

UNIT-V ENDOCRINOLOGY AND REPRODUCTION

Anatomy and physiology of endocrine glands. Hormones - Mode of action, functions of hormones of the endocrine glands - Pituitary, Adrenal, Thyroid, Gonadal hormones, Pancreas, Pineal body and Parathyroid, Hypo and Hyper functions of the glands.

General anatomy –Female and male reproductive system .Testis-Spermatogenesis, male sex hormones, Ovaries-female sex hormones , menstrual cycle and menopause.

REFERENCES:

1. Guyton, A.G. and Hall, J.B. (2005): Text Book of Medical Physiology, 9th Edition, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.

2. Wilson, K.J.W and Waugh, A. (2003): Ross and Wilson Anatomy and Physiology in Health and Illness 8th Edition, Churchill Livingstone.

3. Jain, A.K.: Textbook of Physiology. Vol.I and II. Avichal Publishing Co., New Delhi. McArdle, W.D., Katch, F.I. and Katch V.L(2001): Exercise Physiology. Energy,

4. Nutrition and Human Performance, 4th Edition, Williams and Wilkins, Baltimore.

5. Best ,H and Taylor,B.,1992.The physiological basis for Medical Practice,8 th Edition,The Williams and Wilkins Company

6. Sembulingam,K and Prema Sembulingam (2000): Essential of Medical Physiology, 2nd Edition, Jay pee Brothers Medical Publishers (P) Limited, New Delhi.

7. Chaudhuri,K (1997) Concise Medical Physiology, 2nd Edition, New Central Book Agency (P) Limited, Calcutta-9.

8. Vidya Ratan (1993), Hand Book of Human Physiology, 7th Edition, Jay pee Brothers Medical Publishers (P) Limited, New Delhi.7 and 8 in the syllabus

PAPER – 2
ADVANCED FOOD SCIENCE

OBJECTIVES

Enable the Students

- To understand the principles of cooking.
- To learn the composition of various foods.
- To study the changes in food stuffs during processing and cooking.

UNIT-I Physico Chemical Changes in Foods

Physical properties of water, structure of water and ice, types of water in foods, water soluble interactions, role of water in food systems, Hydrogen ion concentration (pH), Solubility, Solutions, Crystallization, Emulsification, Osmosis, Enzyme action (SS), Oxidation – reduction, Colloids – Stabilizations and properties.

UNIT- II Cereals and pulses

Components and characteristics of food starches, Swelling of starch granules, Gel formation, factors affecting gelatinization, Retrogradation, syneresis, effect of sugar, acid, fat and surface active agents on starch . Stages of sugar cookery (SS), Crystal formation, factors affecting, types of candies, Action of acid, alkalies and enzymes.

Germination and factors affecting germination . Toxicity in pulses-Lathyrism, flavism, Gluten-formation factors affecting their formation, Leavening agents.

UNIT- III Vegetables and Fruits

Vegetables - Structure, Classification, Composition, Nutritive value, Methods of Cooking, Changes in Cooking .

Fruits - Structure, Classification, Composition, Ripening of fruits, changes on ripening, Pectic substances, Cooking changes.

UNIT-IV Egg, Meat and Fish

Egg - Structure, Composition, Nutritive value, Grading, Methods of Cooking and Role of egg in cookery.

Meat - Structure, Composition, Nutritive value, Classes and Grades of meat cuts, Changes on cooking and Rigor mortis. Poultry - Composition, Nutritive value, Grades, Methods of cooking, Effects of cooking.

Fish - Composition, Nutritive value, Types, Cuts, Selection, Spoilage, Cooking and Factors effecting cooking quality.

UNIT-V

Milk and Milk Products - Composition, Nutritive value, Constituents, Properties of milk, Effects of acid and Salt, Heat on milk proteins and coagulation. Milk products - Ice cream, Types, Crystal formation and Dairy forms.

Fats & Oils – Types, properties of fat relating to cooking, Rancidity, Tests for rancidity, Hydrogenation, Changes in fat during heating, Factors affecting fat absorption, Shortening, Use of fat in tenderness of cooked products.

Beverages - Classification, Nutritive value, Preparation of milk based beverages.

Spices and Condiments - Use of spices and condiments in Indian cookery .

REFERENCES

1. Charley, H. (1982): Food Science (2nd edition), John Wiley & Sons, New York.
2. Potter, N. and Hotchkiss, J.H. (1996): Food Science, Fifth edition, CBS Publishers and Distributors, New Delhi.
3. Belitz, H.D. and Grosch, W. (1999): Food Chemistry, (2nd edition), Springer, New York.
4. Abers, R.J. (Ed) (1976): Foams, Academic Press, New York.
5. Cherry, J.P. (Ed) (1981): Protein Functionality in Foods, American Chemical Society, Washington, D.C.
6. SriLakshmi, B. Food Science, New Age International [p] Limited, New Delhi, Third Edition, 2003
7. Potter, N.W., Food Science, AVI Publishing Co. Cunneticut, 1960.
8. Shakuntalamanay, N& Shadaksharaswamy, M, Foods, facts and principles, Wiley Eastern Ltd. 2004.
9. Christian, E.W. Essentials of Food Science, XXIV edition, WWW.Springer.com/978-14614-9137-8. 2014.

PAPER – 3
NUTRITION FOR HEALTH

OBJECTIVES

- To know the computation of allowances.
- To impart knowledge on the importance of nutrition during life span.
- To enlighten on the dietary modifications.

UNIT-I Introduction and General Concepts Of Nutrition

Recommended dietary allowances - RDA for Indians, basic requirements, computation of allowances based on energy expenditure, components of energy expenditure. General concepts about growth and development through different stages of life span.

UNIT-II Nutrition in Pregnancy

Stages of gestation, maternal weight gain, complications of pregnancy, maternal physiological adjustments, nutritional problems and dietary management, importance of nutrition during and prior to pregnancy, teenage pregnancy - nutritional problems and dietary management, planning a menu.

UNIT-III Nutrition in Lactation

Physiology of lactation, hormonal control and reflex action, efficiency of milk production, problems of breast feeding, nutritional composition of breast milk, nutritional needs and requirements during lactation, special foods during lactation, dietary modifications, planning a menu.

Nutrition in Infancy

Infant feeding, nutritional needs for premature infant and their feeding, weaning foods. Feeding problems, over infant formulas, lactose intolerance, and menu planning. Nutrition in Pre-school - Physiological development related to nutrition, feeding problems, behavioural characteristics, nutritional requirement and planning diet.

UNIT-IV Nutrition in school children

Nutritional requirements for school children and factors to be considered for menu planning, feeding problems, and packed lunch.

Nutrition during Adolescence

Changes in growth and development, hormonal influences and changes, Menarche - factors affecting menarche, psychological problems, and body image, eating disorders, behaviour, and nutritional problems, and planning a menu.

UNIT-V Nutrition in Adult and Elderly

Nutrition and work efficiency, Premenstrual Syndrome, Menopausal and Post Menopausal complications and treatment, hormonal changes, nutritional requirements, and menu planning .

Physiological changes in ageing - Psycho-social and economic factors, factors influencing eating behaviour, social situation, knowledge and belief, institutionalization, common health problems, nutritional requirements, and diet modification.

REFERENCES:

1. Melvin H. Williams., Nutrition for health fitness & Sport. 5th edition Mcgraw –Hill, publishing Co., 1999.
2. Judith E. Brown., Nutrition Now, 2nd edition, West / Wadswroth west / Wadsworth, An International Thomson publishing company, 1998.
3. Swaminathan,M. Advanced text book on Food and Nutrition, , Anmol Publication Pvt,Ltd, Second Edition.2004.
4. Gopal,C.Kamalakrishnaswamy, Nutrition in Major Metabolic Disease, Oxford India Paper backs Publisher First Edition 2000.
5. H.P.S. Sachdev, Anna choudhry., Nutrition in children- Developing country concerns N.I. Publications Pvt. Ltd, New Delhi, 2004.
6. Sumati. R. Mudambi, M.V Rajagopal., Fundamentals of Foods & Nutrition, 4th Edition New age International publishers New Delhi, 2006.
7. Srilakshmi, B. Nutrition Science, New Age International [p] ltd, New Delhi, 2002.
8. Bahasahe and B. Dosa, Hand book of nutrition and diet.
9. Venkataiah S.D.,Nutrition Education, Anmol Publication Pvt. Ltd, Revised 2004.
10. Mahtab S.Bamji, Prasad Rao, N.Vinodini Reddy. Textbook of Human Nutrition, Oxford and IBH Publishing Co. Pvt .Ltd, Second Edition, 2003.

PAPER – 4

FOOD MICROBIOLOGY

OBJECTIVES:

Enable the students:

- To learn about the morphology of different microorganisms.
- To study the food spoilage caused by microorganism
- To understand the various types of poisoning and infection caused by microorganism.

UNIT-I

Types and classification of microorganism, role and significance of micro-organisms in foods, morphology of yeast, mould, bacteria, virus, algae and protozoa.

UNIT-II

Micro-organisms and food: Primary sources in foods, cultural characteristics , biochemical activities. Airborne bacteria, fungi ,microorganisms in soil, normal flora of skin, nose, throat, GI tract

UNIT-III

Food in relation to disease - food born diseases, food infection, intoxication, microbial toxins - types, bacterial poisoning and infection - causative agents and sources , symptoms and prevention of staphylococcal food poisoning, botulism, salmonella, bacillus infection, E.coli, food poisoning of fungal origin - ergotism, aflatoxin .

UNIT-IV

Control of microorganism - Principles of preservation, General principles underlying spoilage of foods. Preservation by high and low temperature, chemical preservatives, salt, sugar as preservative, new trends in preservation.

UNIT-V

Sterilization by physical agents - Heat, moist heat, fractional sterilization, pasteurization, other types of sterilization, chemical sterilization . Microbiology of water, typical organisms in water, types of bacterial examination for water, water treatment.

REFERENCES:

1. Pelczar, M.I and Reid, R.D, Microbiology, MC Graw Hill Book Company, New York,5th edition, 1993.
2. Atlas M.Ronalds , Priniciples of microbiology, 1st edition, Mosby – year book Inc, Missouri, U.S.A, 1995.
3. Frazier, W.C, Food Microbiology, MC Graw Hill Inc 4th edition, 1988.
4. Banwart , Basic Food Microbiology, 2nd edition CBS Publisher, 1989.
5. Bensaon, H.J, Microbiological applications, C. Brown publishers, U.S.A, 1990.

MAIN PRACTICAL -I

ADVANCED FOOD SCIENCE & NUTRTION FOR HEALTH

ADVANCED FOOD SCIENCE

1. Cereal cookery - Preparation of rice based products - Idli, Dosai, Appam - study the effect of fermentation and soaking.
2. Preparation of wheat based products - Chappathi, Phulkas, Poories - with different proportion of wheat flour - study the development of gluten.
3. Pulse cookery - Effects of soaking, acid , alkali and sprouting and different methods of cooking - cooking time and quality of pulses.
4. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.
5. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods- foam formation - factors affecting foam formation- Special effect on colour and - tenderness.
6. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils- factors affecting fat absorption.
7. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes.-Crystallization and factors affecting crystallization.

NUTRITION FOR HEALTH

Menu planning, Preparation and Presentation for the following

- Pregnancy
- Lactation
- Infants
- Pre-schoolers
- School going children
- Adolescence
- Adult of different working category
- Old age
- Sports person
- Sea voyage people
- Person working in space

ELECTIVE-I

FUNCTIONAL FOODS AND NUTRACEUTICALS

OBJECTIVES

To enable the students to

- Understand the relationship between Functional foods and Nutraceuticals.
- Impart knowledge on the role of Functional foods and Nutraceuticals in health and in diseases.

UNIT - I

Functional foods – Definition, concept, evolution of functional food market, types of foods categorized as functional foods, health benefits of functional foods and future promises in Indian diet, research frontiers in functional foods.

Nutraceuticals – Definition, teleology, classification based on food source and mechanism of action, nutraceuticals bridging the gap between food and drug, application of nutraceuticals in Indian and International market, future prospects of nutraceuticals.

UNIT- II

Phytochemicals– Definition, classification with food sources– I. Terpenoids II. Carotenoids III. PolyPhenols; IV. Sulphur containing compounds, significance and effect of phytochemicals on health and in managing diseases.

Antioxidants – Definition, classification, food sources, mechanism of action, health benefits and role of Endogenous antioxidants in protecting cell and Exogenous antioxidants in preventing diseases.

UNIT- III

Probiotics – Definition, types, relevance and concept, role of probiotics in gastro intestinal health and other health benefits, recent advances in probiotics - Lactobacillus and Bifidobacterium.

Prebiotics – Definition, types, effect prebiotics on gut microflora and other health benefits, recent advances in prebiotics – galacto-oligosaccharides (GOS), functional disaccharides (lactulose, lactiol and lactose) and resistant starch (RS).

Symbiotics- role of symbiotics and synbiotics in human health promotion.

UNIT – IV

Dietary supplements – Concept, significance of dietary supplements from plant, animal and microbial sources, relevant studies on animals and humans in management of diseases with special reference to - diabetes mellitus, hypertension, CVD, cancer; Food as remedy for disorders - arthritis, bronchitis, osteoporosis, gastric ulcer, circulatory problems, nephrological conditions, liver disorders, and skin diseases. FOSHU foods for healthier life.

UNIT – V

Regulatory aspects- Safety, adverse effects and toxicity of functional and nutraceuticals food products, International and national regulatory aspects, issues and challenges, ICMR guidelines for Probiotics.

REFERENCES

1. Dilip Ghosh, (2012), Innovation in Healthy and Functional Foods, CRC Press.
2. Yashwant Vishnupant Pathak, (2011), Hand Book of Nutraceuticals, Volume II, CRC New Delhi.
3. Webb G.P (2006), Dietary Supplements and Functional Foods, Blackwell Publishing.
4. Mary K. Schmidl, Theodore P. Labuza (2000), Essentials of FunctionaL Foods. Ltd, New York.
5. Tamine. A (2005), Probiotic Dairy Products, Blackwell Publishing Ltd, United Kingdom.
6. USFDA regulations on functional foods.
7. Bamji (2003), Textbook of Human Nutrition, 3rd edition, Oxford & IBH Publishing Co Pvt Ltd, New Delhi.

Journals

1. Journal of nutraceuticals, functional and Medical foods.
2. Nutraceutical World.
3. European Journal of Nutraceuticals and Functional Foods.

SEMESTER II

PAPER - 5

ADVANCED NUTRITION - I

OBJECTIVES

Enable the students :

To understand the importance of nutrients on health and wellbeing.

To study the functions and metabolic role of nutrients.

To stay updated with emerging concepts in nutrition.

UNIT – I

Energy - Energy content of foods, energy measurements - direct and indirect calorimetry, components of energy expenditure - BMR, RMR, physical activity, thermic effect of food, thermogenesis. Energy utilization in cells. Energy balance and control of body weight.

UNIT – II

Carbohydrates - Classification, digestion, absorption and utilization of carbohydrates, physiological functions and nutritional role of carbohydrates. Glycemic index and glycemic load. Dietary fiber- types, resistant starch, fructo- oligosaccharides and other oligosaccharides, physiological significance and role of dietary fiber in therapeutic nutrition.

UNIT - III

Lipids – Classification of fats and fatty acids, digestion and absorption of fats, transport of lipids in blood, lipid transformation in the liver, deposition of fats in the body. Lipotropic factors and nutritional importance of EFA, SFA, MUFA, PUFA.

UNIT -IV

Proteins – Classification of proteins and amino acids, digestion and absorption of proteins, amino acid pool and distribution, protein synthesis and turnover of proteins in the body. Protein requirements – factorial and balance methods. Assessment of protein quality – biologic assays and scoring systems.

UNIT - V

Body composition and water balance – levels of body composition, body fluids – composition, osmolar regulation, routes of fluid and electrolyte loss, types of dehydration and principles of fluid therapy. Water balance - body water compartments, regulation of water balance, disorders of water balance.

REFERENCES :

1. Shils, M.E., Olson, J., Shike, M. and Roos, C (2003). Modern Nutrition in Health and Disease, 9" edition Williams and Williams.A Beverly Co. London.

2. Bodwell, C.E..and Erdman, J.W. (2008) Nutrient Interactions. Marcel Dekker Inc. New York.

3. Sareen, S, James, J (2005). Advanced Nutrition in Human Metabolism, 4th Edition, Thomson Wordsworth Publication, USA.

4. Chandra, R.K. (eds) (2002): Nutrition and Immunology, ARTS Biomedical. St. John's Newfoundland.

5.Antia. F.P and Philip Abraham, 2002, "Clinical Dietetics and Nutrition, Oxford University Press.

6. James L.Groff and Sareen S. Gropper, 1999, Advanced Nutrition and Human metabolism, wadsworth/ Thomson Learning.

7.Garrow, J.S. James, W.P.T and Ralph, A., 2000, "Human Nutrition and Dietetics", Churchil Living stone, Edinburgh.

PAPER – 6

ADVANCED NUTRITION - II

OBJECTIVES

Enable the students :

To understand the role of micro-nutrients and their relationship to human health.

To study the health problems associated with micro nutrient deficiencies/ toxicity.

UNIT – I Macro Minerals

Calcium - Functions and mechanisms of action, absorption and factors affecting absorption, utilization, sources, bioavailability and deficiency. **Phosphorus -** Functions and mechanisms of action, absorption, utilization, sources and deficiency.

Inter-relationship between parathormone and vitamin D in the regulation of calcium and phosphorous metabolism.

Magnesium, Sodium, Potassium, Chloride - Functions and mechanisms of action, deficiency and toxicity.

Outline of the above minerals on assessment of nutriture.

UNIT – II Micro Minerals

Iron – Functions and mechanisms of action, absorption, transport, utilization and storage of iron. Sources, bioavailability, role of iron in prevention of anaemia and assessment of nutriture.

Iodine – Functions and mechanisms of action, absorption, uptake of iodine by the thyroid gland, sources and gotirogens, deficiency and assessment of nutriture.

Zinc, Copper, Selenium, Chromium and Fluorine - Functions and mechanisms of action, food sources, deficiency/toxicity.

UNIT III Fat Soluble Vitamins

Vitamin – A, D, E and K - History, functions and mechanisms of action, metabolism, storage and excretion. Sources, deficiency, toxicity and assessment of nutriture.

UNIT IV Water Soluble Vitamins

Energy releasing B Vitamins -Vitamin B1 (Thiamin), Vitamin B2 (Riboflavin), Vitamin B3 (Niacin), Vitamin B6 (Pyridoxine), Pantothenic acid and Biotin – Physiological and biochemical functions, sources and deficiency.

Hematopoietic B Vitamins - Folic acid, Vitamin B12 (Cobalamin) – physiological and biochemical functions, sources and deficiency.

Vitamin C (Ascorbic acid) –History, functions and mechanisms of action, role of Vitamin C in diseases, deficiency and toxicity, assessment of nutriture.

UNIT V Health Effects of Micronutrients

Vitamin like molecules – Role of Choline, Carnitine, Inositol, Taurine, Pangamate Laetrile and PABA in human health.

Heavy metal toxicity and their harmful effect to health.

Interdependence of minerals and vitamins in human nutrition.

REFERENCES :

1. James L. Groff and Sareen S. Gropper. (2000). Advanced nutrition and human metabolism. 3rd Edition, Wadsworth/Thomson Learning.
2. Shills, M.E., Olson, J. Shike, M. and Roos, C. (2003). Modern nutrition in health and disease. 9th edition, Williams and Williams. A Beverly Co. London.
3. Gibson R.S. (2005). Principles of Nutritional Assessment. 2nd Ed. Oxford University Press.
4. Sareen, S, James, J. (2005). Advanced nutrition in human metabolism. 4th Edition, Thomson Wordsworth Publication, USA.
5. Bamji M.S., Rao N.P., Reddy V. Eds. (2009). Textbook of Human Nutrition. 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd.

PAPER - 7

RESEARCH METHODOLOGY AND STATISTICS

OBJECTIVES:

To enable the students to:

- Understand the fundamental principles and techniques of research
- Learn about the application of statistical procedure in research
- Familiarize on writing the project report

UNIT I Introduction to Research

Definition, Objectives, Characteristics and types of research – Basic, applied, action, evaluation and experimental-preclinical and clinical studies (human intervention trials). Research design in nutrition. Surveys –Descriptive, diagnostic and exploratory. Defining and determining the research problem. Ethical issues – Regulations and guidelines for human subjects, Informed consent.

UNIT II Data Collection and Sampling design

Primary and secondary data-Data sources. Preparation of interview schedules and questionnaires. Observation, Interview method of enquiry, Training of interviewers, Pre-testing and pilot study. Processing of data –editing and coding.

Sampling- Selection of samples, Size of sample, Different sampling designs -probability and non probability sampling methods. Merits and Demerits of sampling method.

UNIT III Organisation, Representation of data and Report writing

Classification - Qualitative, Quantitative-frequency distribution, discrete and continuous. Tabulation of data- Parts of a table, preparation of blank tables.

Representation of data-Diagrammatic- one dimensional and two dimensional diagrams, pictograms and cartograms.

Writing a research report –format of thesis writing with example.

UNIT IV Descriptive Measures

Measures of central tendency- Mean, Median and Mode and their application. Measures of Dispersion – Mean deviation, Standard deviation , Quartile deviation, Coefficient of variation, Percentile, Association of attributes, Correlation coefficient and its interpretation, Rank correlation, Regression equations and prediction, Contingency table.

UNIT V Probability and Tests of Significance

Rules of probability and its application, Normal and binomial distributions in studies,

Test of significance-Large and small sample tests- "t", F and chi square tests and ANOVA applications.

References:

1. Devadas. R.P. A Handbook on methodology of Research, Sri Ramakrishna Vidyalaya, Coimbatore, 2000.

2. Kothari. G.R.Research Methodology, Methods and Techniques, Wiley Eastern limited, New Delhi, 2006.

3. Gupta.S.P.Statistical Methods, Sultan Chand & Sons,New Delhi,2002.

4. Srivastava A.B.L and Sharma. K.K., Elementary Statistics in Psychology and Education, Sterling publishers Pvt .ltd.2003.

5.Kulbir Singh Sidhu, Methodology of research in Education Sterling Publishers Pvt Ltd,New delhi,2006.

6.Gosh .B.N. Scientific Methods and Social Research Sterling Publishers Pvt .Ltd, New Delhi.

MAIN PRACTICAL - II

FOOD ANALYSIS

A. QUALITATIVE TESTS:

1. Reactions of sugars and their identification in unknown mixtures.
2. Tests for proteins and their identification in unknown mixtures.
3. Tests for lipids – glycerol, cholesterol and unsaturated fatty acids.
4. Qualitative tests for carbohydrates, protein and lipids in food stuffs.

B. ANALYSIS OF FOOD:

5. Moisture
6. Ash
7. Fiber
8. Calcium
9. Iron
10. Phosphorus
11. Ascorbic acid
12. Total antioxidants.

ELECTIVE II

PAPER -2 NUTRIGENOMICS

OBJECTIVES:-

- Aim to understand in depth the influence of genetics on micronutrient metabolism.
- It helps in implicating the determination and prevention of human inherited inborn diseases.

Unit-I:

Introduction to Nutrigenomics

Definition, concepts of Functional Genomics, Personalized Nutrition - Concepts, types and recent trends over it. Recent developments and future frontiers in Nutrigenomics.

Unit-ll

Nutrigenomics and Pharmacogenomics

Overview of Nutrigenomics, Inter -relationship and Applications of Nutrigenomics and Pharmacogenomics, Traditional medicine based on Pharmacogenomics, Toxicogenomics - Definition, causes,principles and applications.

Unit-III

Diet and gene expression

Diet and Epigenetics, Shorterm gene expression regulated by factors such as Nucleic acid, protein data bases and nutrient data bases.

Unit-IV

Perinatal programming

Diet in early life and Metabolic programming, Perinatal programming-applications, Myths facts and future Research.

UNIT-V

Genetics in Human Nutrition

Interactions of micronutrients with human diseases (Diabetes, CVD, Cancer, Obesity, Osteoporosis and Neuro degenerative diseases). Role of genetics in Human Nutrient Metabolism.

References:

1. Arkadianos I, Valdes AM, Marinos E, Florou A, Gill RD, Grimaldi KA. “Improved weight management using genetic information to personalize a calorie controlled diet”. Nutrition Journal. 2007;18(6):29. [PMC free article] [PubMed]
2. Bakshi N, Morris CR.” The role of the arginine metabolome in pain:” Implications for sickle cell disease”. Journal of Pain Research. “2016;9:167–175. [PMC free article] [PubMed]
3. EFSA (European Food Safety Authority). “Scientific opinion on establishing food-based dietary guidelines”. EFSA Journal. 2010;8 (3):1460. [PubMed]
4. FDA (U.S. Food and Drug Administration). “The public health evidence for FDA oversight of laboratory developed tests”: 20 case studies. 2015. [January 27, 2018]. https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures /InVitroDiagnostics/LaboratoryDevelopedTests/default.htm.
5. FDA. “Use of real-world evidence to support regulatory decision-making for medical devices”, [January 26, 2018]. https://www.fda.gov/downloads /MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments /UCM513027.pdf.
6. FDA.” Medical foods guidance documents and regulatory information”. https://www.fda.gov/Food/GuidanceRegulation /GuidanceDocumentsRegulatoryInformation/MedicalFoods/default.htm.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS), VELLORE-2

HUMAN RIGHTS

(Compulsory paper for all PG Degree courses)

Unit: I

Theories on Human Rights - Definition – Classification - Characteristic of Human Rights - Historical Development of Human Rights.

Unit: II

Human Rights and U.N.O - Universal declaration of Human Rights - International Covenant on Civil and Political Rights, 1966 - International Covenant on Economic, Social and Culture Rights - Optional Protocol.

Unit: III

Constitutional Guarantee on Human Rights in India - Fundamental Rights - Directive Principles of State Policy – National Human Rights Commission - State Human Rights Commission.

Unit: IV

Human Rights and International Organisations – Amnesty International – Helsinki process – Asia watch – European Human Rights System – African Human Rights – Hot-line.

Unit: V

Contemporary Issues on Human Rights – Bonded Labour – Child Labour – Refugees – Capital Punishment – Women's Rights – Children's Rights.

Books for Reference:-

1. International Bill of Human Rights, Amnesty International Publication, 1988.
2. Human Rights, Questions and Answers, UNESCO, 1982.
3. A.R. Desai – Violation of Democratic Rights in India.
4. Pandey Constitutional Law.
5. K.S. Singh – Indian Social Institution.

SEMESTER III
PAPER -8
DIET THERAPY- 1

OBJECTIVES : To enable the students to:

- Understand the role of nutrition for good health.
- Obtain knowledge of different therapeutic diet and their preparation
- Develop, capacity and attitude for taking up the profession as dietician

Unit I Introduction to diet therapy

Definition, history, growth and scope of dietetics, characteristics, role of dietitians and IDA . Team approach in patient care. Dietetics in modern health care management. Purpose, principles and classification of therapeutic diets, Modification of normal diet, Enteral and Parenteral nutrition-Types, formula composition, advantages and disadvantages. Pre and post operative nutrition.

Unit II Guidelines for dietary planning and procedure

Weights and Measures, Determining nutritional needs, Basic guidelines for diet planning, Nutritional status of Indians, Cultural aspects of dietary Planning. Identification of high risk patients- nutritional assessment, nutritional diagnosis, nutrition intervention, monitoring and evaluation of nutritional care. Assessment components-medical and nutritional care record types and uses, Format for medical and nutrition charting and documentation .

Unit III Nutrition counseling:

Concept, recipient and counseling environment, Problem solving counseling method. Activities for behavior changes, intervention counselling models, types of counseling session in patients. Empowerment, interpersonal skills. Nutritional counseling components – planning, implementation and evaluation.

Unit IV Diet in Endocrine disorders, Fever and Infections

Diabetes mellitus: Etiology, types, clinical and biochemical changes, Clinical signs and symptoms, complications, diagnosis, mode of treatments. Disorders of thyroid and para thyroid glands, tetany, gout and arthritis. **Obesity :** Etiology, theories on Obesity, types, Dietary modification, complications. **Under weight:** Etiology, Dietary modification. **Fevers-** causes, types, metabolic changes, fevers of short duration and chronic fever and infections.

Unit V Diet in Diseases of the gastrointestinal tract

Gastrointestinal tract- Etiology, type, clinical signs and symptoms, diagnosis, diet modifications- peptic ulcer, diarrhoea, dysentery, constipation, gastritis, tropical sprue

dumping syndrome, lactose intolerance, malabsorption and irritable bowel syndrome, diverticulosis and diverticulosis .

References:

1. Robinson C.H. (2007) Normal and Therapeutic nutrition, 12th edition, Mac millan Publishing Co. Inc, Newyork.
2. Krause M.V and Mahan L.K (2010) Food, Nutrition and Diet therapy, 9th edition, W.B. Saunder Co, Philadeephia
3. Srilakshmi. B (2012), Dietetics, New Age International Pvt Ltd, New Delhi.
4. Dietary Guidelines of Indians- A Manual, National Institute of Nutrtition, Hyderabad, 2006.
5. 5. Swaminathan M. Essentials of Food and Nutrition, Vol. I & II Ganesh and Company, Madras, 1974.
6.

Journals:

1. Journal of American Dietetic Association. The American Dietetic Association Mount Arris, Illinois-61054, USA.
2. The American Journal of Clinical Nutrition Published by the American society for Clinical Nutrition, Inc., USA.
3. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Home Science College for Women, Coimbatore.
4. Clinical Nutrition, Bell and Bain Ltd., Scotland.
5. Food and Nutrition Bulletin, United Nations University Press, Japan
6. Clinical Nutrition, Sales Promotion, Department, Churchill Livingstone Medical
7. Journals Robers Stevenson House 1-3, Baxter's place, Edinburgh EHI, EAF.UK.
8. 13. The British Journal of Nutrition, Cambridge Univerasity, Press Journals Dept. 46
9. West 20th Street, New York, 10011-4211.

PAPER -9
DIET THERAPY -2

OBJECTIVES :

To enable the students to:

- Understand the principles of diet and nutrition in the cause and treatment of disease.
- Understand the modifications in nutrients and diet for therapeutic condition.
- Learn recent concepts in dietary management of different diseases.

Unit I Diet in Diseases of liver

Functions of liver, etiology, physiological and metabolic consequences, clinical signs and symptoms, mode of treatment and diet modifications of jaundice, hepatitis, cirrhosis, hepatic coma, cholecystitis, cholelithiasis and pancreatitis.

Unit II Diet in Diseases of cardio vascular system

Etiology, Symptoms, Risk factors of CVD, Role of fat in the development and prevention of atherosclerosis and dietary management of atherosclerosis, Ischemic heart disease, dislipidemia, prevention through life style modifications. Hypertension - Classification, prevalence, diet related factors influencing hypertension, dietary management of hypertension**.**

Unit III Diseases of renal system

Function of kidney, etiology, physiological and metabolic consequences, clinical signs and symptoms and diet modification for Nephritis, Nephrosis. Nephrosclerosis, acute &chronic renal failure - Dialysis: principles and procedure. Renal calculi- etiology, types, dietary modification.

Unit IV Diet in pulmonary disease and cancer

Pulmonary diseases : Bronco pulmonary disease, asthma, respiratory failure.
Cancer : Classification, risk factors, symptoms, general systemic reactions, nutritional problems of cancer therapy, nutritional requirement and diet modifications

Unit V Diets in other disease conditions

HIV and AIDS- Etiology, signs and symptoms, stages, diagnosis and diet modifications

Allergy- definition, classification, manifestation, common food allergies, tests for allergy and diet modification

Surgery - Physiological response, Metabolic Consequences, Stage of Convalescence, pre and post operative diets.

Burns - Metabolic changes in protein and electrolytes and Nutritional support.

References:

1. Antia F.E. Clinical Dietetics and Nutrition, Oxford University Press New Delhi,1973, 1989
2. Davidson Passmore P. and Breck J.P. Human Nutrition and Dietetics. The English Language Book Society, Livingstone, 1975, 1986.
3. Robbinson H. Normal and Therapeutic Nutrition, Oxford and IBH publishing Calcutta, Bombay, 1972, 1987.
4. Krause M.V. Horsch M.A. Food Nutrition and Diet Therapy W.B. Saunders Company, Philadelphia, 1972.
5. William B.R. Nutrition and Diet Therapy C.V. Muusby Camp. Saint, Lowin, 1973.
6. Cooper et. al, Nutrition in health and disease 4th edition, Bippincolt Compl. 1963.
7. Shils, E.M. Olson, A.J. and Shike M.C. Modern Nutrition in Health and Diseases Lea and Febriger Philadephia, Vol. II 1994.
8. Gopalan , C. Ramasastri, B.V. and Balasubramaniam, S.C. Nutritive value of Indian Foods National Institute of Nutrition, Hyderbad 7, 1994.

Journal

1. Journal of American Dietetics Association
2. Indian Journal of Medical Research
3. Indian Journal of Nutrition and Dietetics
4. Nutrition Reviews
5. American Journal of Clinical Nutrtion
6. Applied Nutrition, Journal of Indian Dietetics Association Pub. Secretary of Indian Dietic Association 27/1 Monoharpuku, Calcutta 700 029.

PAPER -10

BIOCHEMICAL BASIS OF NUTRITION

OBJECTIVES:
To enable students
1. Understand the Biochemical and physiological impairments in diseases:
2. Develop skills to analyze selected constituents in blood and urine during diseases:

Unit I

Basis for biochemical estimation- basic principles - general lab information - units of measure. Uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data.

Unit II
Maintenance of Normoglycaemia – Normal Glucose metabolism - glucose transporters - Glucose transporter, Disorders of carbohydrate metabolism proteins - insulin - Biosynthesis, secretion, kinetics and action. Abnormalities of, insulin synthesis and Secretion.
Diabetes mellitus - definition , classification of diabetes - in detail. Long term diabetic complications, management of diabetes mellitus.
Fat metabolism - lipids - types. Lipoprotein - types, metabolism - exogenous pathway, endogenous pathway.
Lipoprotein disorders – primary dyslipoproteinaemics, acquired, Hyperlipididaemia, acquired hypolipidaemia.

Unit III

Clinical biochemistry of nutrition, nutritional requirements - carbohydrate, protein fat, vitamins, minerals. Malabsorption- carbohydrate absorption, protein absorption fat absorption, diarrhoea, its course.Anatomy of liver Hepatic regeneration, physiological function, liver function test and its uses.Poisoning - etiology of poisoning, Diagnosis and management of poisoning Specific poisons.

Unit IV
Anatomy of kidney - gross anatomy and microstructure renal function. Renal diseases and its presentation. Assessment of renal function. Renal Failure - acute and chronic, metabolic Consequences and management of renal . Mechanism of protein conservation by the kidney - urine protein content in health - Proteinuria in renal diseases -Proteinuria in non renal diseases. Renal tubular disorders, renal calculi.

Unit V

Blood - components, function, RBC - structure, function and metabolism, Hemolysis – definition, classification and consequences . Biosynthesis of haem porphyries and its genetics classification . Hemoglobinopathies, structure and function of hemoglobin ,

control of hemoglobin synthesis. Thalasaemias - α and β. Structural Hemoglobin variants SCA.

References

1. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W.(2000): 25th Ed. Harpers Biochemistry.Macmillan worth publishers.
2. Nelson, D.L. and Cox, M.M.(2000): 3rd Ed. Lehninger's principles of Biochemistry, Macmillan worth publishers.
3. Delvin, T.M.(1997): 4th Ed. Text Book of Biochemistry with clinical correlations, Wiley Liss Inc.
4. Stryer, L. (1998): 4th Ed. Biochemistry, WH Freeman and Co.
5. Conn, E.E., Stumpf, P.K., Bruening, G. NS Doi, R.H.(2001): 5th Ed. Outlines of Biochemistry, John Wiley and Sons.
6. Voet, D. Voet, J.G and pratt, C.W.(1999): Fundamentals of Biochemistry
7. Oser, B.L.,(1965) 14th ed. Hawk's Physiological Chemistry.Tata McGraw Hill Publishing Co. Ltd
8. Tietz, N.W. (1976) Fundamentals of Clinical Chemistry. WB Saunders Co.
9. U. Satyanarayan(2006). Biochemistry, New Central Book Agency (pvt) ltd, Edition 3.
10.J.L. Jain(2004).Fundamentals Of Biochemistry (Multi Colour Ed), S Chand publisher, 6th Edition.
11. Murray, R K., Granner, D K., Mayes, P A and Rodwell, V W (2012) : 29th Ed Harper's illustrated Bio-Chemistry. Lange Medical book.

MAIN PRACTICAL

PRACTICAL-3

DIET THERAPY-1 & 2

Diet Therapy 1

1. Practical experience in weighing and measuring food items
2. Different types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
3. Diet for - obesity, underweight, febrile conditions.
4. Diet in gastro intestinal disorders - peptic ulcer, diarrhoea, constipation.
5. Diet in Diabetes mellitus - Insulin dependent diabetic mellitus, non- insulin dependent diabetes mellitus, diabetes with complications
6. Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding.

Diet Therapy 2

1. Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
2. Diet in Cardio vascular disease - Hypertension, atherosclerosis, congestive heart failure.
3. Diet in kidney disorders - Glomerulo nephritis, nephritic syndrome, renal failure, and urolithiasis.
4. Diet in disease of pulmonary diseases –Bronchitis, Asthma and acute and chronic respiratory failure
5. Diet in disease of cancer-Oral, breast, stomach, uterus and colon cancer.
6. Case study-Selecting and observing one patient requiring a therapeutic diet in relation to
7. Patient's dietary history - income, occupation, food habits and social factors.
8. Use of the computer in diet, Counselling and patient education-Preparation of a diet chart

Elective III

PAPER -3

FOOD PROCESSING AND PRESERVATION

OBJECTIVES

To enable the students,

- To understand the basic concept, functions & classification of food.
- To understand the basic principles involved in Preservation and processing techniques

Unit-I

Introduction to food science, concepts of processing, and preservation. Different methods of new processing and preservation techniques used in modern food industry.

Unit-II

Cereals Structure, composition, cereal cookery: Gelatinization, Dextrinization. Processing and Preservation of cereals (Rice, wheat and millets), Processed cereals products,and Ready to eat cereals used in cooking.

Unit-III

Pulses and legumes -Definition, composition, structure of pulses, cooking of legumes and factors affecting cooking time of pulses and legumes. Use of legumes in cookery.Processing and different Preservation methods used for pulses, role of antioxidants activity in pulses.

Unit-IV

Fruits and vegetables- processing , drying and dehydration techniques, canning and freezing. Sugarcane and sago technology - processing and by products utilization.

Dairy Technology- Milk processing, separation, standardization, pasteurization, homogenization, sterilization- Ultra High Temperature (UHT), Sterile milk and milk products, butter, cream and ghee. Fleshy Foods Technology- Meat, Poultry, Fish and Egg Processing and Preservation.

UNIT-V

Oil seed Technology- Extraction of oils, meal concentrates and isolates. Spice technology - Processing, Extraction of essential oils and colours.

Confectionary technology- types of confectionaries and its methods of processing and preservation

References:

1. NIIR Board of Food and Technologist, Modern Technology of Food Processing and Agro based industries, National Institute of Industrial Research, Delhi, 2005.
2. Peter zeuthena nd Leif Bogh- Sorensen, Food Preservation Techniques, Wood Head Publishing Ltd., Cambridge, England, 2005

3. Suman Bhatti, Uma Varma, Fruit and vegetable processing organizations and institutions, CBS Publishing, New Delhi, 1st Ediion- 1995.

4. Mirdula Mirajkar, Sreelatha Menon, Food Science and Processing Technology vol-2, Commercial processing and packaging, Kanishka publishers, New Delhi- 2002.

5. NIIR Board, the complete Technology book on processing, dehydration, canning, preservation of fruits and vegetables, National Institute of Industrial Research, Delhi- 2005.

SEMESTER IV

PAPER -11

COMMUNITY AND PUBLIC HEALTH NUTRITION

OBJECTIVES

To enable the students,

- Gain insight into the national nutritional problems and their implications and appreciate the nutritional and international contribution towards nutrition improvement in India.
- Gain knowledge and skills to use computers in the study of nutrition
- Organize and conduct nutrition education in the community.

Unit I

Nutrition and National Development, Ecology of Malnutrition, Strategies to Overcome Malnutrition

Relation of nutrition to national development, nutrition and food security; Consequences of malnutrition; IMR, NMR,MMR and prevalence of common nutritional problems- PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Ecological factors leading to malnutrition; Synergism between malnutrition and infection; Measures to overcome malnutrition. Nutrition Intervention programmes - Nutritious Noon Meal Programme. ICDS, Prophylaxis programme – Vitamin A deficiency, Iron deficiency anaemia, Iodine deficiency, National Nutrition policy. Empowering women towards improving the nutritional status of the family, community and nation at large.

Unit II

National, International and Voluntary Organizations to Combat Malnutrition, History of malnutrition in India

National organization – ICAR, ICMR, SCWB, SSWB, NNMB, NIN, CFTRI, DFRL, NIPCCID and NFI; International Organizations - WHO, FAO, UNICEF, World Bank, FFHC, WFP; Voluntary organizations – Global Alliance for Improved Nutrition(GAIN), Micronutrient Initiatives, CARE, CRS, AFPRO, IDA; Concepts of Community Health ,Health care of the community.

Unit III

Nutrition Education-Meaning, nature and importance of Nutrition education to the community and lessons to be taught

Training workers in nutrition education programmes Methods of education when to teach, whom to teach Use of computers to impart nutrition education, Organization of Nutrition education programmes.

Unit IV

Epidemiology of Communicable Diseases

Definition of epidemiology - causes, signs and symptoms, treatment and prevention of communicable diseases, respiratory infections, intestinal infections, Other infections- dengue, filariasis. Types of immunity- active, passive and herd-group protection Immunization agents- vaccines, immunoglobulin, Immunization schedules (SS) - Active- National and WHO Expanded Programme on Immunization- Universal Passive, Combined, Chemoprophylaxis, non-specific measures.

Unit V

Environmental Sanitation And Disaster Management

Pollution, Bio manure, Vermi composting, Effective Microorganisms, Water purification and recycling, Types of disaster - natural and manmade –earthquakes, volcanic eruptions, flash foods, major floods, tsunami and drought, fire accidents , bomb blast. Disaster management-mitigation strategies-Role of NGO's and GO's and nutritionists. Prevention, warning systems and relief, Major nutritional and health considerations in disaster Emergency feeding ,mass and supplementary feedings ,management of feeding operations ,water and food safety.

References:

1. Park A. (2007), Park's Textbook of Preventive and Social Medicine XIX Edition M/S Banarasidas, Bharat Publishers, 1167, Prem Nagar, Jabalpur, 428 001(India)
2. Bamji M.S, Prahlad Rao N, Reddy V (2004). Textbook of Human Nutrition II Edition, Oxford and PBH Publishing Co. Pvt. Ltd , New Delhi
3. Bhatt D.P (2008), Health Education, Khel Sahitya Kendra, New Delhi
4. Gibney MJ, Margetts BM, Kearney JM, Arab L (2004) Public Health Nutrition Blackwell Publishing Co. UK
5. Swaminathan M (2007), Essentials of Food and Nutrition. An Advanced Textbook Vol.I, The Bangalore Printing and Publishing Co. Ltd, Bangalore

Journals:

1. Reports of the State of World's Children, WHO and UNICEF, Oxford University.
2. Reports of National Family Health Survey, International Institute for Population Science, Mumbai.
3. Indian Journal of Medical Research, ICMR, New Delhi,
4. Indian Journal of Pediatrics, Valley Nicro, Missouri, U.P.
5. Indian Journal of Nutrition and Dietetics, Avinashilingam Deemed University, Coimbatore.
6. Proceedings of the Nutrition Society of India, NSI, Hyderabad.

PAPER-12

FOOD STANDARDS AND QUALITY CONTROL

Objectives:

- To know the importance of quality control and quality assurance in food industry.
- To know the tests and standards for quality assessment of food
- To know the laws and standards ensuring food quality and safety

UNIT-I: INTRODUCTION OF QUALITY CONTROL

Definition, scope and significance of quality control. Principles of quality control. Quality attributes of Food – Nutritional, microbial and sensory quality. Quality assurance - Quality assurance in Food Services System, Quality control vs Quality assurance.

UNIT-II: EVALUATION OF QUALITY OF FOODS

Sensory Evaluation of foods – Subjective and objective methods of evaluation of food. Types of test, limitation of sensory evaluation. Improvised instruments used for Indian recipes.

UNIT-III: FOOD ADDITIVES

Definitions, classification and function, Natural and synthetic origin of additives, preservatives, antioxidants, colours and flavours, emulsifiers, sweeteners, buffering salts, anti caking agents. Toxicological evaluation of food additives.

UNIT-IV: FOOD ADULTERATION

Definition, reasons for food adulteration, methods of adulteration, and methods of detection. Consumer's responsibilities, consumer organizations. The prevention of food adulteration Act, The consumer protection Act.

UNIT- V: FOOD STANDARDS AND FOOD LAWS

Food laws and standards -Concept, need and its importance. National food legislation such as FSSA, Essential Commodities Act, ISI or BIS, AGMARK,FPO International Organization implementing food standards- FAO, FDA, Codex Alimentarius, ISO 22000 series, WHO and APEDA. HACCP.

References:

1. Early, R. Guide to Quality Management Systems for the Food Industry, Blackie,Academic and Professional, London
2. Gould, W.A. and Gould, R.W. Total Quality Assurance for the Food Industries, CTI Publications Inc, Baltimore

3. Pomeranz, Y. and Meloan, C.E. Food Analysis : Theory and Practice, CBS Publishers and Distributor, New Delhi
4. Askar, A. and Treptow, H. Quality Assurance in Tropical Fruit Processing, Springer – Verlag, Berlin
5. Ranganna, S. Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd Edition, Tata McGraw hill Publishing Co Ltd., New Delhi
6. Hagstad, H.V. and Hubbert, W.T. Food Quality Control, Foods of Animal Origin, Lowa State University Press, AMES
7. Srilakshmi, B. Food Science, New Age International (P) Ltd., Publishers, New Delhi.

ELECTIVE 4

PAPER -4
FOOD BIOTECHNOLOGY

OBJECTIVES
To enable the students,

- Understand the application of biotechnology in the field of foods and nutrition.
- Create interest in related activities of tissue culture and fermentation technology.
- Learn the concept of xenobiotics and nanotechnology.

Unit I

Definition and importance of biotechnology. Genetic Engineering: Enzymes as tools – Exonucleases, Endonucleases, Restriction Endonucleases, Ligases, Reverse Transcriptase and Alkaline Phosphatase. Cloning Vectors – Plasmids, bacteriophage, Cosmids and Phasmids.

Unit II

Fermentation Systems – batch and continuous process, environmental factors, fermenter design. Microbial cell growth, microbial metabolism, regulation of metabolism and product secretion.

Unit III

Plant and animal tissue culture – principles and procedure, culture media, applications. Transgenic plants – Golden rice, BT brinjal, GM mustard, Flavr savr tomato. Production of microbial protein – Single Cell Protein (SCP), Spirulina, Mushroom Culture and yeast biomass production.

Unit IV

Synthesis of citric acid, glucouronic acid, lactic acid. Sweeteners – Glucose syrup and high fructose corn syrup. Vitamins – Vitamin A, Riboflavin, Vitamin B 12 thickeners and gelling agents – xanthan gums. Food fermentations – alcoholic beverages, cheese making, fermented soya based foods, vinegar and meat fermentation.

Unit V

Xenobiotics – Definition, components and metabolism of xenobiotics. Concepts and applications of nanotechnology. Downstream processing, biosensors, biochips, limiting factors and regulation. Safety aspect of foods produced by biotechnology.

References:

1. V.K.Joshi and AshokPandey (2009) Biotechnology: Food fermentation – microbiology, Biochemistry and Technology, volume – I, Asia Tech Publishers, New Delhi.
2. Satyanarayana.U (2007) Biotechnology, Books and Allied (P) Ltd., Kolkata.
3. Meenakshi Paul (2007) Biotechnology and Food Processing Mechanics, Gene – Tech Publishers
4. Ravishankar RAi, V(2015) Advances in Food Biotechnology. Wiley – Blackwell.
5. Green P J (2002), Introduction to Food Biotechnology, CRC press, USA

Journals

1. Food Technology, Journal of Institute of Food Technology, Illinosis, USA
2. Food technology, Abstract, Central Food Technological Research Institute(CFTRI), Mysore
3. Trends in Biotechnology, USA.

MAIN PRACTICAL 4

NUTRITIONAL ASSESSMENT AND DIET COUNSELLING

1. Community based project for assessment of nutritional status of any vulnerable group by using
    - Anthropometry
    - Clinical Examination
    - Biochemical
    - Biophysical
    - Diet Survey

2. Practical consideration in giving dietary advice and counselling –
    - Factors affecting and individual food choice.
    - Communication of dietary advice
    - Consideration of behaviour modification
    - Motivation.

3. Preparation of Counselling aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material for patients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitis and cirrhosis.

4. Computer application
    a) Use of computers by dietitian
    b) Dietary computations
    c) Dietetic management
    d) Education/ training
    e) Information storage
    f) Administrations
    g) Research

5. Preparation of case history of a patient and presentation of the report.

MANAGEMENT PRINCIPLES

UNIT-I

Nature and Functions of Management - Importance and Process of Management - Historical Roots of Contemporary Management Practices: Pre-modern era-Classical Contributions - Development of Management Thoughts - Managerial Roles: Role of a Manager - Levels of Management - Managerial Skills - Social Responsibilities of Business.

UNIT-II

Nature and Importance of Planning -Types of Plans - Steps in Planning-Making Planning Effective - Strategic Considerations in Planning - Management by Objectives - Decision Making: Rationality in Decision Making - Decision Making and MIS - Forecasting: Techniques of Forecasting.

UNIT-III

Need for Organization - Principles and Process of Organizing - Span of Management - Organization Structure - Variables affecting Structure - Departmentalization - Authority, Delegation and Decentralization - Committees.

UNIT-IV

Staffing and Directing: Staffing as a Function of Management - Requirement of Effective Direction - Functions of Direction - Principles of Direction - Supervisor and his Qualities - Supervisor's Role and Functions - Effective Supervision.

UNIT-V

Co-Ordination - Need for Co-Ordination - Principles and Techniques of Co-ordination - Control: Need for Control - Steps in Control Process - Control Techniques.

ELEMENTS OF INSURANCE

Objective:

To gain a knowledge of insurance and its importance.

UNIT-I

Definition of insurance - classification of Contracts of insurance - marine and non-marine - general principles of law as applied to non-marine insurance.

UNIT-II

Life Assurance - objects of life Assurance - principles of life Assurance - different plans of life Assurance and annuities - policy condition and privilege - assignment and nomination - lapses and revivals - surrender values and loans - claims - double insurance.

UNIT-III

Marine insurance - principles of marine insurance - functions of marine insurance - proximate clause - subrogation and contribution

UNIT-IV

Types of marine policy - clauses in general use - warranties - kinds of marine losses - reinsurance and double insurance.

UNIT-V

Fire insurance - principles of law as applied to fire insurance - the subject matter of fire insurance - fire waste - hazard types of fire policy - cover notes - surveys and inspection average - re-insurance - renewals.

Text and Reference Books:

1. Dr. B. Vardharajan - Insurance Vol 1 and 2. - Tamil Text Book.
2. R.S. Sharma - Insurance Principle & Practice - Vara Bombay, 2006.

A. Murthy - Elements of Insurance Risk management & Insurance - Harrington, 2006 - Tata McGraw Hill pub.

Customer Relationship Management

Courses objectives:

- To make students understand about the importance of customer information database
- To teach on the elements and process of CRM
- To impart knowledge on the strategic and operational CRM
- To acquireinformation about the concept and types of service quality
- To make students understand the current trends in CRM

Course outcomes:

- Candidates will be enriched with the knowledge on customer behaviour, customer perception and customer profile analysis
- Students would be knowing about the structure and models of CRM for business applications
- Able to understand the tools of CRM, role of CRM managers in implementation and customer retention plans
- Candidates could be equipped with knowledge on service quality gaps, dimensions and methods of measurement
- Gain information about data mining, data warehousing and changing corporate culture

UNIT

INTRODUCTION

Definitions - Concepts and Context of relationship Management – Evolution - Transactional Vs Relationship Approach – CRM as a strategic marketing tool – CRM significance to the stakeholders.

UNIT II

UNDERSTANDING CUSTOMERS

Customer information Database – Customer Profile Analysis - Customer perception, Expectations analysis – Customer behavior in relationship perspectives; individual and group customer's - Customer life time value – Selection of Profitable customer segments.

UNIT III

CRM STRUCTURES

Elements of CRM – CRM Process – Strategies for Customer acquisition – Retention and Prevention of defection – Models of CRM – CRM road map for business applications.

UNIT IV

CRM PLANNING AND IMPLEMENTATION

Strategic CRM planning process – Implementation issues – CRM Tools- Analytical CRM – Operational CRM – Call center management – Role of CRM Managers.

UNIT V

TRENDS IN CRM

e- CRM Solutions – Data Warehousing – Data mining for CRM – an introduction to CRM software packages.

B. RECENT ISSUES IN INDIAN ECONOMY – II

Course Objectives

1. Understand the approach farming and precision.
2. Analyse the trends in agricultural farming
3. Understand the pricing of agricultural inputs.
4. Describe the performance of public sector enterprises in India.
5. Distinguish between micro and small enterprises.
6. Understand the corruptions.
7. Understand the tax evasions.
8. Explain trade reports in India.

Unit-1: Agricultural Sector

Size of farms – Trends in agricultural production – Organic farming – Precision farming – Pricing of agricultural input – Agricultural marketing – Agricultural credit.

Unit-2: Industrial Sector

Growth and pattern of industrialiastion – Industry policy since 1991 – Micro and small enterprises – Measures to promote MSEs – MSEs act 2006 – Industrial sickness.

Unit-3: Service Sector

Education – Health – Contributions of education and health to development – Policies and performance – Commercial banking – Development banking –Insurance – Information technology sector

Unit-4: Good Governance

Factors affecting good governance – Parallel economy – Black money – Corruption – Corruption perception index in India - Tax evasion – Reforms in Fiscal sector, money market and capital market - SEBI

Unit-5: External Sector

Structure and direction of foreign trade – Structure and components of balance of payment – Export and import policy – Foreign capital and aid – Foreign direct investment – MNCs in India – Trade reforms in India.

* Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registred by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(i). Head of the respective department

(ii). Mentor

(iii). One faculty from other department

**Mooc Courses

Inclusion of the Massive Open Online Courses (MOOCs) with zero credits available on SWAYAM, NPTEL and other such portals approved by the University Authorities.

Company Law

Objectives:

- To acquire knowledge about the regulatory framework of companies
- To know about the different kinds of shares and debentures
- To identify the various managerial personnel of the company
- To gain knowledge about arranging meetings and resolution passing procedures
- To make the students understand about recent amendments of winding-up a company

Learning outcome:

- Students would be able to understand the meaning and basic characteristics of company and how it differs from other forms of businesses,
- Students will be equipped on the issue of shares, bonus and rights shares
- Able to identify the independent directors and key managerial personnel of the company
- Students could get sound knowledge on various kinds of meetings and resolutions
- Can acquire knowledge about various methods of winding-up of a company.

UnitI: JointStockCompany

Meaning - Kinds of Companies (Special Provisions with respect to PrivateCompany, Public Company, OnePersonCompany,Small Company,Dormant Company) - Formation-MemorandumofAssociation-Contents-Restrictionon"OtherObjects"- DoctrineofUltraVires-ArticlesofAssociation-Contents-Prospectus-Contents-Types (StatementinLieuofProspectus,shelfProspectus,RedHerringProspectus)- Underwriting-BookBuildingProcess-GreenShoeOption-E-Filing-Dematerialisation.

Unit II: Share Capital and Debentures

Meaning of Shares- Kinds of Shares- Voting rights-Issue of shares at a Premium and Discount-Partly paid shares- Bonus Shares- Rights shares-Sweat Equity Shares. Debentures-Meaning-Types.

Unit III: Managerial Personnel

Directors-WomenDirectors-IndependentDirectors-DirectorIdentificationNumber- Other Key Managerial Personnel- Related Party Transactions.

Unit IV: Meetings and Resolutions

Meeting-StatutoryMeeting-AnnualGeneralMeeting-ExtraordinaryGeneralMeeting-NoticeofMeeting-Quorum-Proxy-BoardofDirectorsMeeting-Committee-Typesof Committee-Audit Committee-Stake Holders Relationship Committee- Corporate Social Responsibility Committee. Resolutions-Ordinary Resolution- Special Resolution
-Resolution requiring special notice.

Unit V: Winding up of Company

ModesofWindingup-WindingupbytheCourt-VoluntaryWindingup-Types-Members Voluntary Winding up-Creditors Voluntary Winding up. National CompanyLawAppllate Tribunal.

Modern Banking

Course Objective:

1. To provide the students with the latest development in the field of Banking and Financial System.
2. To evaluate the theories relating to the role of banks as financial intermediaries.
3. Understand the role of transactions costs and informational asymmetries in the operation of the banking system.
4. To understand how bank-based systems differ from market-based systems.
5. To enhance and analyses the various bank performance measures.

OUTCOME:

1. To enhance the functions of Commercial Banks and Central Bank.
2. To learn the various types of deposits.
3. To understand the E-Banking and Internet Banking & Mobile Banking
4. To enhance Electronic fund transfers system.
5. To learn about Electronic payment systems

Unit – I:

Banking – Meaning – Definition – History of Banking – Banking System - Unit Banking Branch Banking - Mixed Banking –Commercial Banking – Functions - Credit Creation – Money Market – Characteristics – Constituents of Indian money market.

Unit – II:

Central Banking – Functions – Credit Control Devices – RBI – Functions – Different Departments of RBI.

Unit – III:

Nationalizations of Commercial Banks – Causes – Achievements – Pitfalls – SBI – SBI Groups – Functions – SBI and Industrial finance – SBI Rural Finance – RRBs - Functions – Co-operative Banks – Co-operative Credit Structure – Achievements of Co-operative Banking – Challenges.

Unit – IV:

E-Banking – Meaning - Benefits – Internet Banking Services – Drawbacks – Mobile Banking – Features – Drawbacks – Call Centre Banking – Features – Challenges – ATM – Types - Features – Benefits – Challenges – Credit Cards – Benefits – Constraints – Debit Card – Benefits – Smart Card – Features – Biometric Cards – Features – MICR Cheques – Benefits.

Unit – V:

Electronic Fund Transfer (EFT) - RBI Guidelines – Benefits of Electronic Clearing Systems – E-Cheques – E-Money – Real Time Gross Settlement (RTGS) – Benefits to Banker and Customer – Cheque Transaction – Core Banking Solutions (CBS) – Benefits – Single Window Concepts – Features.

I. LABOUR ECONOMICS

UNIT-I

Concept: Concept of Labour - Labour Economics and Labour problems - Factors responsible for labour problems - Characteristic features of Indian Labour.

UNIT-II

Collective Bargaining Power: Trade Union Movement in India - Meaning, Functions and role of trade Unions; Problems and Measurers to strengthen T.U.

UNIT-III

Industrial Disputes: Forms of Disputes - Meaning and causes, prevention methods, Joint Management Council - Code of Discipline. Settlement of Disputes: Works Committee - Conciliation Officer - Board of Conciliation - Court of Enquiry - Labour Court - Industrial Tribunals.

UNIT-IV

Labour welfare: Labour Legislations: Social Security in India: Workmen's Compensation - Sickness Benefits Maternity Benefits - Retirement Benefits - ESI Act.

UNIT-V

National Commission on labour: Recommendations ILO purpose and functions - India and ILO

QUALITY MANAGEMENT

Course objective:

- To understand the success factors, the principles for successful implementation of Quality Management.
- To understand the tools and technique for implementation of TQM in any industry.
- To create awareness about the ISO certification process and new trend like Six Sigma.

Course outcome:

At the end of the course the students will be able to:

CO – 1: Define the quality based on the quality gurus.

CO – 2 Acquire knowledge on the various techniques of TQM

CO – 3: Recognize the implementation of SPC tools.

CO – 4: Degree of variation, defect and opportunity based on six sigma.

CO – 5: understand the concept of BPR.

UNIT-I

Stages of quality control, History of quality, Quality management and its importance, Contributions of quality gurus, Impact of quality on business performance, Distinction between product quality and service quality, Desirable qualities of a leader, Leadership grid, Quality information system, Strategy development and deployment, Need for quality approach to strategy, Quality and its types, Supporting policies

UNIT II

Functions of human resource management (HRM), recruitment and selection, Training Methods, quality circles- Steps of quality circle meetings, Implementation of quality circle, Rewards and recognition, Customer Focus - Customer focus Vs Process focus, Internal customers and management, Quality edge, Factors affecting customer satisfaction, Role of marketing for customer satisfaction, Importance of customer retention, Impact of Customer Retention on Profitability, Steps of developing customer focus

UNIT III

_ Process and Statistical Quality Control- quality system, control chart for variables (X and _R) and (X and S charts), control charts for attributes (p, c and u charts), Six Sigma - elements of sig sigma, DMAIC Methodology, DMADV Methodology, six sigma technical tools, Benchmarking - types of benchmarking, stages of benchmarking process, Cost of quality- Activity based costing, Business performance management - performance measures and their importance, balanced score card, quality control activities during product cycle and balanced score card.

UNIT IV

Total productive maintenance - objectives of TPM, performance measures of maintenance system, pillars of TPM, stages of implementation of TPM , reliability, Failure modes and effects analysis (FMEA), - Introduction to ISO Series..

UNIT V

Business process reengineering- steps of business process reengineering, measures of performance of BPR, applications of BPR, Building and sustaining total quality .

A. ORGANISATIONAL DEVELOPMENT

Objective: To prepare the students as organizational change facilitators using the knowledge and techniques of behavioral sciences and understand the applicability of OD interventions to be facilitated through case-studies.

Course Outcomes: The successful completion of this course shall enable the student:

CO1: To understand the need and philosophy of organization change and development in the changing times.
CO2: To learn OD as an applied field of change.
CO3: To understand techniques of collection and analyses of organizational diagnosis information and the significance of feedback in delivering diagnostic information.
CO4: To comprehend designing and evaluation of different types and levels of interventions and their ability to address organization"s survival.
CO5: To explore the role of OD in addressing issues relating to globalization, OD research-practice interface and challenges faced by OD.

UNIT-I

Introduction to Organisation Development:- Concepts, Nature and Scope of O.D. : Historical Perspective of O.D. - : Underlying Assumptions & Values Theory and Practice on change and changing - The Nature of Planned Change - The Nature of Client Systems : Group Dynamics, Intergroup - Dynamics and Organisations as Systems.

UNIT-II

Operational Components of O.D - Diagnostic, Action and Process - Maintenance components.

UNIT-III

O.D.Interventions: - Team Interventions - Inter-group Interventions - Personal, Interpersonal and group process interventions - Comprehensive interventions - Structural Interventions.

UNIT-IV

Implementation and assessment of O.D - Implementation conditions for failure and success in O.D. - efforts. - Assessment of O.D. and change in organisational performance - The impact of O.D.

UNIT-V

Some key considerations and Issues in O.D - Issues in consultant - Client relationship - Mechanistic & Organic systems and contingency approach - The future of O.D. - Some Indian experience in O.D

A. BUSINESS ORGANIZATION

UNIT-I

Business - Meaning - Types of Business and Profession - Organization - Meaning and importance of Business Organization.

UNIT-II

Forms of Business Organization - Sole Trader, Partnership - Joint Hindu Family System - Joint Stock Companies - Co-operative Societies - Public Utilities and Public Enterprises.

UNIT-III

Location of Industry - Factors influencing location and size - Industrial Estates and District Industries Centre.

UNIT-IV

Stock Exchange - Functions - Working - Services - Regulations of Stock Exchange in India, Business combinations - Causes - Types - Effects.

UNIT-V

Trade Associations and Chamber of Commerce.

C. CORPORATE SOCIAL RESPONSIBILITY

Course Objectives

1. To enhance the understanding of the corporate Social responsibility of Business
2. To extend the knowledge of factors influencing CSR policy
3. To facilitate the students to have the understanding about benefits of CSR to the company
4. To students to know about institutional investors in corporate governance
5. To let students to know about corporate governance board and its power.

UNIT I

Corporate social responsibility – Meaning – Definition – scope of CSR– a rational argument of CSR – Economic argument for CSR – strategies of CSR – challenges and implementation of CSR in Indian – relation between CSR and corporate governance – major code of CSR initiative in India – barriers to social responsibility – social responsibility of business.

UNIT II

Designing a CSR policy – factors influencing CSR policy – managing CSR in an organization role of the human resource professional in CSR– global reorganization of CSR – ISO 14000 – SA8000 – AA1000 – codes – formulated by an Global compact – UNDP – global reporting Initiative.

UNIT III

CSR reporting trend in developing countries – timing and mode of release of CSR reports – CSR policy of a multi-product, multi-location Indian MNC's – constitutions of corporate social responsibility – dimensions of CSR – benefits of CSR to the company.

UNIT IV

Corporate governance – concept, structure, process, origin – scope and present scenario – role of institutional investors in corporate governance – structure and development or board – role of capital marketing governance, governance rating future of governance – innovation practices – case studies with lesion learned.

UNIT V

Corporate governance board and its power – responsibility – disqualification, board committee and their functions – remuneration committee – nomination committee, compliance committee – share holder grievance committee – investor relation committee – investment committee – risk management committee – and audit committee – regulatory framework of corporate governance in India; SEBI guidelines and clause 49; reforms in the company act 2013 – corporate governance in PSU; and banks.

OPERATIONS MANAGEMENT

Course Objective: -

To understand the strategic role of operations management in creating and enhancing a firm's competitive advantages.

- To understand the concepts of layout, planning, maintenance, quality and inventory control, material and store management.

Course Outcomes

- . Reveal the ability to apply some mathematical forecasting techniques
- Summarise the Facility Location concepts and to Classify the Layouts.
- Describe the inventory implementation system.
- Study the work study features
- To understand basic Maintenance Planning and Control concepts.

UNIT-I

Systems Concept of Production, Types of Production System, Productivity, World Class Manufacturing. Forecasting: Demand Patterns, Measures of forecasting, Forecasting Models: Simple Moving Average Method, Weighted Moving Average, Simple(single) Exponential Smoothing, Linear Regression, Delphi Method.

UNIT-II

Facility Location: Factors influencing Plant Location, Break Even Analysis. Plant Layout & Materials Handling: Classification of Layout, Advantages and Limitations of Process Layout, Advantages and Limitations of Product Layout, Advantages and Limitations of Group Technology Layout. Layout Design Procedures: Introduction to CRAFT, ALDEP & CORELAP, Material Handling System, Unit Load Concept, Material Handling Principles, Classification of Materials Handling Equipments. Line Balancing: Concept of Mass Production system, Objective of Assembly Line Balancing, Rank Positional Weight Method. Inventory Control: Review of Basic Models of Inventory, Quantity Discount Model.

UNIT-III

Implementation of Inventory Systems, Introduction to P & Q system of Inventory Nature of Aggregate Planning Decisions, Aggregate Planning Strategies, Aggregate Planning Methods: Heuristic Method, Flow Shop Scheduling: Introduction, Johnson's Problem, Extension of Johnson's Rule.

UNIT-IV

Work Study: Method Study – Recording Techniques, Steps in Method Study, Principles of Motion Economy, Time Study.

Quality Control: Introduction, Need for Controlling Quality, Definition of a Quality System, Classification of Quality Control Techniques, Control Charts, Control Charts for Variable, Control Charts for Attributes, C-Chart, Acceptance Sampling: Operating Characteristic Curve (O.C. Curve), Single Sampling Plan.

UNIT-V

Maintenance Planning and Control: Maintenance Objectives, Types of Maintenance, Basic Reasons for Replacement(Need for Replacement), Group Replacement Vs Individual Replacement – Trade-off.

Reliability: Reliability Improvement, Reliability Calculations for systems in series and parallel, Just-in-Time Manufacturing: Introduction-Overview of JIT, Kanban Systems.

It is requested that all communications should be addressed to The Controller of Examinations, Thiruvalluvar University and not to any person by name

Website :www.tvu.edu.in
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Phone : (0416) 2274701, 2274766
Fax: (0416) 2274702

திருவள்ளுவர்பல்கலைக்கழகம்
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Dr. R. VIJAYARAGAVAN. M.Sc., M.Phil., B.Ed., Ph.D.,
CONTROLLER OF EXAMINATIONS (FAC)

No.TVU/M.Phil/Ph.D/Course Work Examinations/**377A**

30/07/2021

Date:27.07.2021

To

The Principal of all affiliated colleges offering Ph.D. degree.

Sub: CFR – Conduct of M.Phil / Ph.D., Course Work Examinations for 2020-2021 Batch– Reg.

Ref: This office letter No.TVU/M.Phil/Ph.D/Course Work Examinations/377, dated 22.07.2021

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In continuation of the above reference cited, you are instructed to inform to the Ph.D. research Supervisors to submit the syllabus and 2 sets of question papers on the following subjects**(except Paper – I Research Methodology and Research and Publication Ethics)** to the Controller of Examinations(by name), Thiruvalluvar University and also submit the external question paper setters outside of the jurisdiction of Thiruvalluvar University along with the complete postal address email id and mobile number send to the Controller of Examinations through email)phd-cfr@tvu.edu.in) on or before **05.08.2021.**

Ph.D scholars (without M.Phil.,)	
PAPER	SUBJECT
Paper-I	Research Methodology
Paper-II	Advanced Paper-I
Paper-III	Advanced Paper-II
Paper-IV	Guide Paper
	Two MOOC COURSE
	Research and Publication Ethics

Ph.D scholars (with M.Phil.,)	
PAPER	SUBJECT
Paper-I	Guide Paper
Paper-II	Two MOOC COURSE

Further I am to inform that the pattern of the question papers as follows:

Part-A 10 x 2 = 20 marks
Part-B 5 x 5 = 25 marks
Part-C 3 x 10 = 30 marks

For MOOC course question paper - MCQ type Max Mark 75 x 1 = 75 marks

Sd/-
Controller of Examinations

ANNEXURE

Course Title:

- **Research and Publication Ethics (RPE)**-Course for awareness about the publication ethics and publication misconducts.

Course Level:

- 2 Credit course (30 hrs.)

Eligibility:

- M.Phil., Ph.D. students and interested faculty members (It will be made available to post graduate students at later date)

Fees:

- As per University Rules

Faculty:

- Interdisciplinary Studies

Qualifications of faculty members of the course:

- Ph.D. in relevant subject areas having more than 10 years' of teaching experience

About the course

Course Code: CPE- RPE

Overview

- This course has total 6 units focusing on basics of philosophy of science and ethics, research integrity, publication ethics. Hands-on-sessions are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics (citations, h-index, Impact Factor, etc.) and plagiarism tools will be introduced in this course.

Pedagogy:

- Class room teaching, guest lectures, group discussions, and practical sessions.

Evaluation

- Continuous assessment will be done through tutorials, assignments, quizzes, and group discussions. Weightage will be given for active participation. Final written examination will be conducted at the end of the course.

Course structure

- The course comprises of six modules listed in table below. Each module has 4-5 units.

Modules	Unit title	Teaching hours
Theory		
RPE 01	Philosophy and Ethics	4
RPE 02	Scientific Conduct	4
RPE 03	Publication Ethics	7
Practice		
RPE 04	Open Access Publishing	4
RPE 05	Publication Misconduct	4
RPE 06	Databases and Research Metrics	7
	Total	**30**

Syllabus in detail

THEORY

- **RPE 01: PHILOSOPHY AND ETHICS (3 hrs.)**

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgements and reactions

- **RPE 02: SCIENTIFICCONDUCT (5hrs.)**

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

- **RPE 03: PUBLICATION ETHICS (7 hrs.)**

1. Publication ethics: definition, introduction and importance
2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contributorship
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

PRACTICE

- **RPE 04: OPEN ACCESS PUBLISHING(4 hrs.)**

1. Open access publications and initiatives

2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.

- **RPE 05: PUBLICATION MISCONDUCT (4hrs.)**

A. Group Discussions (2 hrs.)

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

B. Software tools (2 hrs.)

Use of plagiarism software like Turnitin, Urkund and other open source software tools

- **RPE 06: DATABASES AND RESEARCH METRICS (7hrs.)**

A. Databases (4 hrs.)

1. Indexing databases
2. Citation databases: Web of Science, Scopus, etc.

B. Research Metrics (3 hrs.)

1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
2. Metrics: h-index, g index, i10 index, altmetrics

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