

M.PHIL SYLLABUS

RESEARCH METHODOLOGY (MBC101)

UNIT I Scientific Research [35 hours]

Research .definition, importance & need for research ethics, selection of topic, hypothesis. Research schedules, Sample collection techniques,. Data collection , review of literature & its use in designing a research work. Mode of collection of literature .year books, books & monographs, journals, conference proceedings, abstracting & indexing journals, notes & index cards, internet, magazines, CD- ROMS. Preparation of manuscript- plan of the report, designing of methodology, interpretation of data & thesis layout. Scientific writing .characteristic of scientific writing, essential features of an abstract, presentation of data, writing of results & discussions.Computer application in scientific research.World Wide Web. Finding scientific articles . Pub med .Public biological databases. Power point features, slide preparation.

UNIT II Bioinformatics [25 hours]

The scope of bioinformatics.The internet. The world wide web. File formats. Biological data bases-sequence and structure-NCBI,PDB. Data retrieval – the Entez system. Searching sequence databases – sequence similarity searches, substitution matrices. Database search-FASTA and BLAST.Protein multiple sequence alignments-CLUSTAL.Protein docking

UNIT III Biostatistics [25 hours]

Collection and classification of data – diagrammatic and graphic representation of data – measurement of central tendency – standard deviation – standard error- normal distribution – test of significance based on large samples – small samples – student t test – F test- correlation and regression – Chi square test for independents of attributes – ANOVA. Use of SPSS . Multiple Duncan's test

UNIT IV [25 hours]

Blotting techniques, CD-spectra,Capillary electrophoresis, working and applications. ELISA. Spectroscopy-general principle and applications-Mass spectroscopy,XRD- DNA sequencing- sangers and pyrosequencer, 2D electrophoresis, MALDI-TOF, COMMET assay,PCR,peptide mass finger printing

UNIT V Bioethics and Patenting [25 hours]

Bioethics involved in animal studies,Patents-process and product,copyright,TRIPs, IPR, plant breeder's right, conditions for patenting; patenting of liveforms.

REFERENCE BOOKS.

1. R.A.Day. How to write a scientific paper. Cambridge university press.
2. CoorayP.G.Guide to scientific and technical writing.
3. Carter V Good and Douglas E seats Methods of Research.
4. Alley, Michael. The craft of scientific writing Englewood Cliffs.N.N.Prentic 1987.
5. M.C. Sharma, Desk Top Publishing on PC, BPB Publications, 1887.
6. Lesk, A.M. Introduction to Bioinformatics Oxford 2002.
7. Krane et al fundamental concepts of bioinformatics Benjamin Cummings.
8. SundarRao, Jesudian Richard – An introduction to Biostatistics.
9. S.P.Gupta – Fundamentals of statistics, Sultan Chand.
- 10.Ethics and the use of alternatives to animals in research and education.ShiraneePereira.CPCSEA.
- 11.CPCSEA guidelines for laboratory animal (CPCSEA) – No.13 Scaward road, ValmikiNagerChennai – 41.
- 12.Ethical guidelines for biomedical research on human subjects. ICMR,New Delhi, 2000.
- 13.Dickson. Molecular and cell biology of human gence therapeutics. SeriesChapman and Hall 1995.
- 14.Research and Development Funding Schemes of Central GovernmentDepartments and Agencies. Ministry of Science and Technology,Departement of Science and Technology, New MehrauliRoad,New Delhi– 110106.
- 15.Biostatistical analysis-Zar 5th *Edition Publisher*: Prentice Hall
- 16.Molecular cloning-sambrook,ManitiesVol-I,II, and III
- 17.Current protocols in molecular biology,Ausubel *Publisher: Current Protocols*

BIOCHEMICAL ASPECTS OF DISEASES (MBC102)

UNIT I [25 hours]

Maintenance of blood sugar- Diabetes mellitus-classification- stages- complications and monitoring.carcinogenesis- molecular basis of cancer-oncogenes- mechanism-Antioncogenes-p53 pathway and its role

UNIT II [25 hours]

Formation of free radicals, autoxidation initiated by oxygen radicals, Influence of free radicals in metal toxicity. Free radical hepatotoxins- CCl₄ model .free radicals and cancer .Oxidative process in tissue injury. Detection of free radicals and radical ions.Role of free radicals in diseases.

UNIT III [25 hours]

Marker enzymes in hepatobiliary disease, myocardial infarction,atherosclerosis, renal dysfunction.

Cancer markers for oral, prostate, colorectal breast and GI tract cancer, oncofetal cancer markers.

UNIT IV [25 hours]

Enzymic antioxidants- Chemistry, mechanism, antioxidant effect of SOD, catalase, Glutathione Peroxidase.NonEnzymic antioxidants- source,chemistry,toxicity, biochemical functions,bioavailability,bioassays,Antioxidant effects of Vit A, Vit C, Vit E, glutathione and selenium.

UNIT V [35 hours]

Toxic mechanism-Carcinogenesis, teratogenesis& immunotoxicity,LD50, ED50,TI Heavy metal toxicity - effects of physiochemical and biological factors. Bioassays for heavy metal toxicity, pathological and histopathological examinations for heavy metal toxicity.

REFERENCES:

1. Biochemistry oxygen toxicity, Annual review of Biochemistry Enrique cadinar, Vol 58,1989.pp 78-110
2. Free radicals in biology by William a.Pryor,Academic press 1980.,pp 96-150.
3. Heavy metal toxicity testing in environmetal samples, Reviews of environmental contamination and toxicology in chul, Kong ,GabrialBitton,Benkoopan,vol 142.1995.pp 130-136.
4. Methods of plant analysis,Phytochemical analysis by J.B.Harborne,chapman& Hall Ltd.1973 pp 1-26.

5. Pharmacology of medicinal plants and natural products by S.A.Dhanukar, R.A.Kulkarani,W.N.Rege, Indian Journal of Pharmacology,2000 S81-S118.
6. Selenium dependent enzymes-glutathione peroxidase. Annual review of Biochemistry by Thresser,stadman ,Vol 49.1980 pp 103-108.
7. Superoxide radicals & SOD by Irwin Fridowich Annual review of Biochemistry,Vol 64.1995 pp 97-106
8. Vitamins –Annual research review by Horrobin ,Eden Press Pub.,Vol.3. 1980.pp 59-82,91-105,218-291.
9. Clinical chemistry-Allan etal
- 10.Clinical biochemistry by William J.Marshall
- 11.Biochemistry of diseases by Robert M.cohn