THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY,

69, ANNA SALAI, GUINDY, CHENNAI - 600 032.

REGULATIONS & SYLLABUS

FOR

M.Sc - GENETIC COUNSELING

(Post - Graduate Degree Course Under Allied Health Science)

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI -600 032

REGULATIONS OF THE UNIVERSITY (Post-graduate Degree course under Allied Health Science)

M.Sc – GENETIC COUNSELING

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr. M.G.R. Medical University, Chennai Act 1987(Tamil Nadu Act 37 of 1987) the Standing Academic Board of the Tamil Nadu Dr. M.G.R.Medical University, Chennai hereby makes the following regulations:-

SHORT TITLE AND COMMENCEMENT:-

These shall be called as **REGULATIONS "M.Sc – GENETIC COUNSELING"** of the Tamil Nadu Dr. MGR Medical University, Chennai.

They shall come into force from the academic year 2015-2016

The regulations framed are subject to modification by the Standing Academic Board from time to time.

OVERALL OBJECTIVES:

The **M.Sc – GENETIC COUNSELING DEGREE COURSE UNDER POST GRADUATE ALLIED HEALTH SCIENCES** is designed.

To develop Post Graduate Allied Health Professionals with in-depth knowledge and competency suited for Genetic Counseling in the healthcare sector.

To provide intensive practical knowledge of Genetic Counseling.

To hone the counseling service of a healthcare professional.

1. **ELIGIBILITY FOR ADMISSION**

Candidates should have passed Degree in Regular Stream from any one of the following branches from any recognized university of India to be eligible for admission into M. Sc – Genetic Counseling.

B. Sc(Bio- Technology)

B. Sc (Nursing)

B.Sc (Bio-Chemistry/ Microbiology / Botany / Zoology)

2. AGE LIMIT:

No upper age limit for Admission

3. ELIGIBILITY CERTIFICATE:

Candidates who have passed any qualifying examination as stated in (1) other than the Tamil Nadu Dr. M.G.R. Medical University shall obtain an "Eligibility Certificate" from this University by remitting the prescribed fees along with the application form and required documents before seeking admission to any one of the affiliated institutions. The application form is available in the University website :web.tnmgrmu.ac.in.

4. REGISTRATION:

A Candidate admitted to **M.Sc – GENETIC COUNSELING DEGREE COURSE UNDER POST GRADUATE ALLIED HEALTH SCIENCES** in any one of the affiliated institutions of this University shall register his / her name with this university by submitting the prescribed application form for registration duly filled along with the prescribed fee and a declaration in the format to the Controller of Examinations of this University through the affiliated institution within 30 days from the cutoff date prescribed for the course for admission. The applications should bear the date of admission to the said course.

5. MIGRATION/TRANSFER OF CANDIDATE:

(a) A student studying in **M.Sc – GENETIC COUNSELING DEGREE COURSE UNDER POST GRADUATE ALLIED HEALTH SCIENCES** can be allowed to migrate / transfer to another institution of Allied Health Science under the same University.

(b) Migration / Transfer can be allowed to another affiliated institutions under extraordinary circumstances. The Vice - Chancellor has the power to issue Migration / Transfer order.

6.. COMMENCEMENT OF THE COURSE:

The course shall commence from 1st September of the academic year. Cut off date for Admission is 30th September every year.

7 .MEDIUM OF INSTRUCTION:

English shall be the Medium of Instruction for all the Subjects of study and for examinations of the **M.Sc – GENETIC COUNSELING DEGREE COURSE UNDER POST GRADUATE ALLIED HEALTH SCIENCES.**

8. CURRICULUM:

The Curriculum and the syllabus for the course shall be as prescribed in this regulations are subject to modifications by the Standing Academic Board from time to time.

9. DURATION OF THE COURSE:

The duration of certified study for the **M.Sc – GENETIC COUNSELING DEGREE COURSES UNDER POST GRADUATE ALLIED HEALTH SCIENCES** shall be **Two** academic years including period of exam. The admitted candidates should complete this course within 4 years (double the duration) from the date of joining the course.

10. RE-ADMISSION AFTER BREAK OF STUDY:

The regulations for re-admission are as per the University Common Regulation for Re-admission after break of study for all courses.

11. **WORKING DAYS IN THE ACADEMIC YEAR.**

Each academic year shall consist of not less than 270 working days

Total No. of working days including (Term day 270 days 85% Attendance) Examination period

12. ATTENDANCE REQUIRED FOR ADMISSION / EXAMINATION:

(a) No candidate shall be permitted to appear in any one of the parts of **M.Sc – GENETIC COUNSELING DEGREE COURSE UNDER POST GRADUATE ALLIED HEALTH SCIENCES** Examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of study, attendance and satisfactory conduct from the Head of the institution.

(b) A candidate is required to put in a minimum of 85% of attendance in both theory and practical separately in each subject before admission to the examinations.

13. CONDONATION OF LACK OF ATTENDANCE:

There shall be no condonation of lack of attendance.

14. VACATION:

There is no vacation

15. INTERNAL ASSESSMENT MARKS:

The Internal Assessment should consist of the following points for evaluation:-i) Theory

ii)Practical

(a) A minimum of three written examinations shall be conducted in each subject during a year and the average marks of the three performances shall be taken into consideration for the award of Internal Assessment marks.

16. CUT-OFF DATES FOR ADMISSION TO EXAMINATIONS:

(i) 30th September of the academic year concerned for Admission.

(ii) The candidates admitted up to 30th September of the academic year shall be registered to take up the 1st year examination during October of the next year.

17. **COMMENCEMENT OF THE EXAMINATONS:**

15th October / 15th April

If the date of commencement of examination falls on Saturdays / Sundays or declared Public Holidays, the examination shall begin on the next working day.

18. MARKS QUALIFYING FOR PASS:

50% of marks in the University Theory Examinations

50% of marks in the Practical with Viva

50% of marks in aggregate in Theory, I.A & oral taken together.

19. CARRY OVER OF FAILED SUBJECTS:

1. Carry any number of failed papers to second year course but has to be completed before appearing for Second Year Examination..
2. The candidate has to successfully complete the course in double the duration (i.e. 4 years from the date of joining)

20. **REVALUATION / RETOTALLING OF ANSWER PAPERS:**

Re - totalling / Revaluation of answer papers is not permitted.

21. SCHEME OF EXAMINATIONS:

First Year

S.NO	SUBJECT TITLE	IA		THEORY		PRACTICAL	
		Max.	Min.	Max.	Min.	Max.	Min.
1	Embryology and Anatomy	50	25	100	50	50	25
2	Basic Genetics	50	25	100	50	50	25
3	Basic Communication Skills *	50	25	100	50	---	---
4	Psychology and Sociology	50	25	100	50	---	---
5	Research Methodology *	50	25	100	50	---	---

*** 3 & 5 No University Theory Exam / Only Internal Papers.**

Second Year

S.NO	SUBJECT TITLE	IA		THEORY		PRACTICAL	
		Max.	Min.	Max.	Min.	Max.	Min.
1	Laboratory Genetics	50	25	100	50	50	25
2	Clinical Genetics (Part - 1)	50	25	100	50	50	25
3	Clinical Genetics (Part -2)	50	25	100	50	50	25
4	Epidemiology and Biostatistics *	50	25	100	50	---	---
5	Genetic Laws *	50	25	100	50	---	---

*** 4 & 5 No University Theory Exam / Only Internal papers.**

Theory Examination Pattern
Duration: 3 hrs Max.Marks: 100 / each paper
Part – A (2 x 20 = 40) Marks
Part – B (10 X 6 = 60) Marks

	Max.	Min.
Project	100	50
Viva / Practical	100	50
I. A	50	25

*** Minimum Pass 50%**

22. Submission of Project

1. Project should be in a bound volume of a minimum of 30 - 50 pages of typed in Double line spacing and on one side only.
2. The Project should be submitted to the Institution 3 months before the Second Year Examination.
3. The student should prepare a PPT presentation of the project at the time of Viva – Voce Examination..

23. **LOG BOOK**:

Based on the curriculum Log Book to be maintained and the same is periodically, assessed by HOD and presented at the time of discussion of project in Practical Examination.

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DETAILED CURRICULUM

FIRST YEAR

PAPER – I : EMBRYOLOGY AND ANATOMY

Unit – I Human Embryology

Overview of normal human embryological development,genetics, other etiologies of abnormal development, teratogen influence, birth defect mechanism, common birth defects and evaluation.

Unit – II Anatomy

Basic anatomy of neuro, renal musculoskeletal, cardiac, gastrointestinal tract, genitourinary system and human reproduction.

Practicals:

Observation of genetic clinic
Genetic history taking & pedigree drawing

Reference:

1. Langman's Medical Embryology
2. *Emery's* Elements of *Medical Genetics*
3. *Thompson & Thompson Genetics in Medicine*
4. *Sear's Anatomy & Physiology for Nurses*

PAPER II - BASIC GENETICS

Unit – I

Overview on Human Genetics and Cell division

Unit – II

Mendelian genetics: Mendel's experiments,Law of segregation, monohybrid crosses,Law of independent assortment and exceptions, introduction to linkage and recombination , Inheritance in families, pedigree symbols, autosomal dominant, autosomal recessive X-linked inheritances. Multifactorial, Mitochondrial and complex inheritance

Unit -III

Chromosomes: A portrait, number, human cytogenetics nomenclature, chromosome identification, Autosomal and sex chromosomal abnormalities

Unit –IV

Nucleic acids: DNA - the genetic material structure, replication; RNA. Genome organization, Arrangement of genes, Transcription, Genetic code, Translation, Control of gene expression, DNA methylation and imprinting

Unit -V

Mutation: types, mutagens, effects, mutants used in genetic studies, spontaneous and induced mutations, Molecular genetics of Human disease

Unit – VII

Genetic counselling: pedigree analysis, diagnostic information, risks and odds Hardy-Weinberg Equilibrium

References:

1. Principle of Genetics, 8th Edition, Gardner, Simmons, Snustad

2. Human Molecular Genetics, 2nd edition, Tom Strachan and Andrew P. Read

PAPER III – BASIC COMMUNICATION SKILLS,

UNIT-I: BASIC COMMUNICATION– Definition – Process – Barriers of Communication - Systems approach- Forms - Functions and Principles of Communication - communication patterns - interpersonal perception – Types of Communication employed in Business Organization – Importance of Communication

UNIT-II: NON-VERBAL AND INTERCULTURAL COMMUNICATION - Importance of non-verbal communication - personal appearance - facial expressions- movement posture – gestures - eye contact –voice - beliefs and customs- worldview and attitude.

UNIT–III: ORAL COMMUNICATION - Listening - types and barriers to listening - speaking - planning and audience awareness - persuasion- goals - motivation and hierarchy of needs - attending and conducting interviews-participating in discussions, debates – and conferences - presentation skills- paralinguistic features - fluency development strategies

UNIT-IV: BUSINESS CORRESPONDENCE - Business letter - principles of business writing memos -e-mails – agendas- minutes- sales letter- enquiries- orders- letters of complaint claims and adjustments- notice and tenders- circulars- letters of application and résumé.

UNIT-V: BUSINESS PROPOSALS AND REPORTS - Project proposals - characteristics and structure-Project reports – types- characteristics,- structure-Appraisal reports – performance appraisal, product appraisal-Process and mechanics of report writing visual aids- abstract - executive summary- recommendation writing-definition of terms.

Unit-VI: Meeting purpose - Procedure - Chairmanship - Participation - Physical arrangements. Seminars and conference. Types of discussion groups - Resulting speech - Conducting seminars, Organizing conference, evaluating oral presentation. Technical proposals, Key factors - Types - contents format evaluation.

REFERENCE BOOKS:

1. Business Communication, N.S. Raghunathan & B. Santhanam – Margham Publications, 2011.
2. Murphy, Herta, Herbert W Hildebrandt, and Jane P Thomas, Effective Business
3. Raman, Meenakhshi, and Prakash Singh, Business Communication. O U P, New Delhi, 2nd Edition, 2012

PAPER – IV: PSYCHOLOGY AND SOCIOLOGY

UNIT – I: Introduction
Definition of Psychology; Historical antecedents of Psychology and trends in the 21st century; Psychology and scientific methods; Psychology in relation to other social sciences and natural sciences; Application of Psychology to societal problems.

UNIT – II: Development of Human Behaviour
Growth and development; Principles of development, Role of genetic and environmental factors in determining human behaviour; Influence of cultural factors in socialization; Life span development - Characteristics, development tasks, promoting psychological well-being across major stages of the life span.

UNIT – III: Thinking and Problem Solving
Piaget's theory of cognitive development; Concept formation processes; Information processing, Reasoning and problem solving, Facilitating and hindering factors in problem solving, Methods of problem solving: Creative thinking and fostering creativity; Factors influencing decision making and judgment; Recent trends.

UNIT – IV: Work Psychology and Organisational Behaviour:
Personnel selection and training; Use of psychological tests in the industry; Training and human resource development; Theories of work motivation – Herzberg, Maslow, Adam Equity theory, Porter and Lawler, Vroom; Leadership and participatory management; Advertising and marketing; Stress and its management; Ergonomics; consumer psychology; Managerial effectiveness; Transformational leadership; Sensitivity training; Power and politics in organizations. Psychological principles underlying effective teaching-learning process.

UNIT – V: Community Psychology
Definition and concept of community psychology; Use of small groups in social action; Arousing community consciousness and action for handling social problems; Group decision making and leadership for social change; Effective strategies for social change. **Psychology of Gender:** Issues of discrimination, Management of diversity; Glass ceiling effect, Self fulfilling prophesy, Women and Indian society.

Unit-VI: Sociology: Social Action: Basic Concepts and Terms- Methodologies of the Social Sciences -Religion and Social Change- Sociology as Science- The Division of Labour and Forms of Solidarity- Systems of Classification

Unit – VII: Rehabilitation Counseling: Various components of rehabilitation counseling
a) Motivational counseling – Social and Educational counseling – Vocational and Career guidance – Independent living skill - b) Role of Government and NGO's in rehabilitating the Differently Able Persons – Various Govt. schemes and Benefits for the Differently Able Persons and Referral services - c) Preparing data base of Rehabilitation Centre's with Address and availing list of various Government Schemes and Benefits which are available for the Differently Able Persons

References:

1. Atkinson, R.L., Atkinson, R.C., Smith, E.E., & Hilgard, E.R. : Introduction to
2. Psychology, (Latest Edition). Harcourt Brace Java Publishers, Tokyo.
3. Business Communication, N.S. Raghunathan & B. Santhanam – Margham Publications, 2011.
4. Murphy, Herta, Herbert W Hildebrandt, and Jane P Thomas, Effective Business

PAPER V – RESEARCH METHODOLOGY

Objectives:

1. To introduce the concept of scientific Research and the methods of conducting scientific data collection.
2. To introduce the statistical tools of data Analysis and to conduct a Research study and prepare the report writings protocol.

UNIT – I-RESEARCH METHODOLOGY

Introduction to concepts – Definition, objectives, types approaches, significance – Research methods v/s methodology – Research process – Criteria of good research – Research problems encountered by researchers – Defining the Research problem – Defining a Research problem, and its importance – Technique involved in a selecting a Research problem- Selecting the Research problem – Research Design – Meaning and need for research design – Features of a good design – Important concepts relating to research design – Explanation of different types of research designs and their uses- Developing a research plan.

UNIT – II - SAMPLING DESIGN

Census and sample survey – the Sampling Process – Sample Size – Determination – Various sampling methods – Measurement and scaling Techniques – Measurement concept in research – Measurement scales and test of sound measurement – Technique of developing measurement tools – Sources of errors in measurement – Scaling – definition, classification, important techniques – derived Attitude Scales – Scale construction techniques – questionnaire Design.

UNIT – III - METHODS OF DATA COLLECTION

Concept of primary and secondary data – Methods of data collection – questionnaire, schedule – Observations, interview, case study, etc – Appropriate method of data collection and guideline Data Processing and Analysis – Processing operations – Problems in processing – Unvaried Hypothesis Tests – Hypothesis tests Requirement interval data – Hypothesis tests using ordinal data – Hypothesis tests using nominal data – Multivariate Hypothesis Test – ANOVA without interaction – ANOVA with interaction – Measures of Association – Measure of Association between two variables – Multivariate Measures of association – types of analysis and statistics in research

UNIT – IV -INTERPRETATION AND REPORT WRITING

Meaning of interpretation – Need and technique of data interpretation – Caution in interpretation – significance and steps in report writing – Marketing Information and Decision Support systems – Marketing Information systems – Marketing Decision support systems – Expert systems.

UNIT –V - SALES FORECASTING

Judgmental Methods of forecasting – forecasting by time Series Analysis and Projection – Casual methods of Forecasting – error costs and the value of Forecasts – the choice of Forecasting Models.

UNIT – VI - ETHICAL ISSUES IN RESEARCH

The nature of Ethical issues in Research – Ethical Issues in Medical Research – Health Management Research – Introduction to concept of HMR – Steps in the Process of HMR – HMR as a tool in health management decision making process – Avenues and approaches to HMR.

References:

a) Research Methodology - Methods & Techniques - C.R. Kothari, 2nd Edition (1992), Eastern limited publication
b) Research Methodology, Ravi Lochanan, Margham Publishers Ltd.
c) Marketing Research – Measurement & Method – Donald S. Tull, Del I. Hawkins, Prentice Hall India.
d) Marketing Research – Boyd & Westfall

SECOND YEAR

PAPER I- LABORATORY GENETICS

Unit – I

Sterilization methods, Human chromosome preparation (Peripheral blood lymphocyte culture), Preparation of buffers, stain and other reagents, GTG banding, karyotyping

Unit – II

Genomic DNA extraction and determination of DNA concentration, Polymerase chain reaction (PCR), Agarose Gel electrophoresis

Unit – III

Recording of family and personal history, Pedigree construction, Analysis for Mendelian diseases and Multifactorial disorders

Unit - IV

Genotyping methods: DNA Sequencing, PCR-RFLP, AS-PCR, Introduction to massively parallel sequencing, analysis and interpretation of the sequence data

Unit – V

Introduction to genetic testing and its types, pre and post test counseling and evaluation

Unit – VI

Introduction to Bioinformatics: Usage of databases like, OMIM, NCBI, Ensemble, UCSC Genome browser, Emboss, PDB

References:

1. Human Cytogenetics Vol.I & II, Rooney, Czepulkowshi
2. Inherited Eye Diseases, Diagnosis and clinical management, Saul Merin, Marcel Dekker Inc 1991
3. Human Molecular Genetics, 2nd edition, Tom Strachan and Andrew P. Read
4. The Biology Behind Genetic Counseling. Joanne Sutherland
5. Advanced Molecular Biology, 1st South Asian Edn 1998; Bios scientific publishers Ltd A concise reference by RM Twyman
6. PCR – The Polymerase Chain Reaction, Birkhauser Boston Edn. 1994 Edited by Kary B Mullis, Francois Ferre, Richard A Gibbs
7. Genome Analysis, A laboratory manual, Vol 2, Detecting Genes, Bruce Birren et al; 1998 Cold Spring Harbour Laboratory Press
8. Genome Analysis, A laboratory manual, Vol 4, Mapping Genomes, Bruce Birren et al; 1999; Cold Spring Harbour Laboratory Press

PAPER II– CLINICAL GENETICS (PART 1)

UNIT–I Antenatal Counseling
Counseling for common congenital anomalies, observe fetal ultrasonography

UNIT –II Prenatal Counseling
Biochemical screening – timing, methods, result interpretation.
Counseling regarding various prenatal diagnosis techniques, risks associated with invasive procedures, interpretation of laboratory results and their limitations. Observe foetal sampling procedure (amniocentesis, chorionic villus sampling, cordocentesis).

UNIT – III Peri-conceptional Counseling
Counseling recurrent pregnancy loss, autopsy report review, pre – marital counseling

UNIT–IV Metabolic errors
An approach to diagnosis of metabolic disease using initial screening techniques and then more definitive biochemical parameters an enzyme assays,management and prognosis in metabolic disorders including information regarding therapeutic benefits of dietary management, use of vitamin factors, drugs and interventions such as bone marrow transplant.

UNIT–V Dysmorphology
Etiology and pathogenesis in dysmorphology including the distinction between malformations, deformations, disruptions and dysplasias; syndromes, associations and sequences. Approach to identification and diagnosis using medical literature and computer databases.
Learning common syndromes.

UNIT –VI Ophthalmology
Molecular genetics of developmental anamolies of the globe, corneal disorders, monogenic retinal degenerative diseases, retinoblastoma, uveal melanoma, multifactorial diseases of the eye

UNIT–VII Hematology
Genetics of hematological disorders like thalassemia, sickle cell anemia, hemoglobinopathies

PRACTICALS
Eliciting of medical history, developmental and reproductive history and family history, including drawing of detailed pedigree chart. - Recording morphological features and anthropometry and documentation of the findings, including photographs. - Planning consultations with relevant specialties and investigations, and pre-test counseling. - Obtaining the informed consent for procedures.- Interpreting and explaining the results of genetic tests such as results of screening tests,chromosomal, biochemical and molecular diagnosis.- Determining the mode of inheritance and risk of occurrence and recurrence of the genetic condition/birth defect, and appropriate communication. - Explaining the diagnosis, etiology, natural history, monitoring and management of a genetic disorder and providing counseling for reproductive options including prenatal diagnosis and anticipatory guidance. - Providing general, supportive & specific medical care to the affected individuals, including appropriate interventions where necessary. - Providing written documentation of medical, genetic and counselling information for families and other health professionals.

References:

1. Atlas of Inherited Metabolic Diseases
2. **Mendelian Inheritance in Man: A Catalog of Human Genes and Genetic Disorders, Victor A. McKusick, Vol I & II**

DATABASES :

OMIM
POSSUM
LDDB

PAPER III – CLINICAL GENETICS (PART – 2)

UNIT –I: NEURO GENETICS
Normal development of brain and associated genetic syndromes, genetics, investigations & management

UNIT –II: CARDIOLOGY
Common congenital heart defects and associated genetic syndromes, genetics, investigations & management

UNIT –III: ONCOLOGY
Common cancers, oncogenesis, genetics & counseling

UNIT –IV: MISCELLANEOUS
Molecular Genetics of Endocrinological and Musckuloskeletal disorders

PRACTICALS
Eliciting of medical history, developmental and reproductive history and family history, including drawing of detailed pedigree chart.- Recording morphological features and anthropometry and documentation of the findings, including photographs. - Planning consultations with relevant specialties and investigations, and pre-test counseling. - Obtaining the informed consent for procedures. - Interpreting and explaining the results of genetic tests such as results of screening tests,chromosomal, biochemical and molecular diagnosis.
Determining the mode of inheritance and risk of occurrence and recurrence of the genetic condition/birth defect, and appropriate communication. - Explaining the diagnosis, etiology, natural history, monitoring and management of a genetic disorder and providing counseling for reproductive options including prenatal diagnosis and anticipatory guidance. - Providing general, supportive & specific medical care to the affected individuals, including appropriate interventions where necessary. - Providing written documentation of medical, genetic and counselling information for families and other health professionals.

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PAPER IV – EPIDEMIOLOGY AND BIOSTATISTICS

Unit – I: CONCEPT OF HEALTH AND DISEASES: Concepts of Health, Definition and Dimensions of Health, spectrum of Health, Determinants of Health, Indicators of Health, concept of disease. Concept of disease, Concept of disease causation, Natural history of disease, Concept of disease control, Levels of prevention, Modes of disease intervention, Internal classification of disease.

Unit – II: PRINCIPLES OF EPIDEMIOLOGY & EPIDEMIOLOGICAL METHODS: Definition and basic concepts of Epidemiology including epidemiological triad. Basic measurement in Epidemiology including measures of mortality and morbidity, Methods in Epidemiology, Infectious disease epidemiology, Investigation of an epidemic out break.

Unit – III: COMMUNICABLE AND NON-COMMUNICABLE DISEASES:
Nosocomial infectious and other common communicable disease - Measles, Chickenpox, Tuberculosis, viral hepatitis. HIV / AIDS, Tetanus. Common Non communicable diseases - Coronary Heart Disease, Hypertension, diabetes, Cancer.

Unit –IV: DEMOGRAPHY AND FAMILY WELFARE: Demographic Cycle, Demographic trend in India, National population policy 2000, Family Planning / Welfare Concepts Contraceptive methods. National Family Planning Programme. Environment and health Pollution - Nature sources health effects and management concept of disinfection and decontamination, Hospital waste management, Control measures in wards operation theaters, laundry, kitchen, etc.

Unit –V : INTRODUCTION TO BASIC STATISTICS: Introduction to concepts - Experimental settings and tests of hypothesis - Areas of application in statistics - Introduction to some essential features - Data recorded in routine clinical practice - qualitative and quantitative observations - Scale of measurement. Arithmetic mean. Median, Mode, position of averages, percentiles - Geometric mean and Harmonic mean - selection of appropriate measures of central tendency - Measures of dispersion - concept of range - main deviation – Inter-quartile range, variance and standard deviation - coefficient of variation and method of calculating standard deviation.

Unit- VI: CORRELATIONS, LINEAR REGRESSION & TESTS OF SIGNIFICANCE:
Introduction - Scatter diagram, correlation and regression - correlation coefficient and regression equation and restriction - Multiple regression and other extensions - Estimations for large and small samples - distribution of chi - square - formula, degree of freedom - application and misuses of chi- square test - non parametric statistical tests further statistical methods - Introduction to concepts - Advantages and disadvantages of non parametric tests - Non parametric tests examples and illustrations.

References:

1. An introduction of Biostatistics - A manual for students in Health in Health Sciences". 3rd Edn. (1996) - P.S.S.Sundar Rao and J.Richard, Preentice Hall of India publishers.
2. Textbook of Preventive & social Medicine, (1997) 15th edition - J.E. Park

PAPER – V: GENETIC LAWS

Unit -I - CODE OF MEDICAL ETHICS: Code - Duties of Physician to their patients - Duties of Physician to the profession at large - duties of Physician to the profession in consultation - Duties of Physician to the profession to the public - Disciplinary action.

Unit -II - THE MEDICAL TERMINATION OF PREGNANCY ACT 1971: Indication or Grounds of MTP - Requirements for MTP - Complications of MTP - doctor and Criminal abortion.

Unit -III - THE PRENATAL DIAGNOSTIC RECHNIQUES ACT 1994 : Regulation of genetic counseling center - Regulation of pre -natal diagnostic technique - Determination of Sex prohibited - dying Declaration - Definition - Precautions - Procedure of Recording - Special Circumstances - Importance (section 32 & 157) of Indian Evidence Act) - Death Certificate - Precautions while issuing death certificate - contents of Death Certificate - Importance of Death certificate.

Unit -IV - MEDICAL JURISPRUDENCE: Introduction & Legal Procedure - Medico legal aspects of death injuries - General aspects - Medical ethics - consumer Protection Act.

Unit -V - Medico Legal Aspects - Importance - Sterility - Sterilization & Artificial Insemination - Medico Legal aspects of Psychiatric and mental health - toxicology - Laws Relating to toxicology - Organ Transplantation At - Tamil Nadu clinics Act.

Unit -VI - LEGAL FRAMEWORK: Introduction to Legal framework - Patient's rights & provider's responsibility - Medical Malpractice of Medical Malpractice.

References:

a. Doctor & Laws, Singhal
b. Forensic Medicine and Toxicology, Dr.V.V.Pillay
c. Organ Transplantation Act – Bare Act, Supreme Court of India
d. Indian Evidence Act – Bare Act

SYLLABUS

Epidemiology, Biostatistics and Medical Ethics

UNIT I: Epidemiology

Introduction: Historical aspects and evolution of epidemiology, definitions and concepts in Epidemiology.
Approaches in epidemiology: Descriptive and analytical epidemiology, disease burden, natural history of diseases and measures of risk and death.
Study design and sampling: Sample size estimation and introduction to study design in epidemiological investigations.

UNIT II: Biostatistics

Fundamentals of biostatistics: Introduction, types of data, tabular and graphical presentation of data. Measures of location, dispersion and correlation: Measures of central tendency. Mean, mode, median, GM, HM, quartiles Measures of dispersion—ra nge, standard deviation, variance, coefficient of variation.
Probability and statistical inference: Concept and probability distribution. Normal distribution—density curves, applications and statistical tables. Concept of significance tests, parametric and nonparametric tests, standard error and confidence intervals.
Inferential statistics: Probability and distributions – Poisson, Binomial a nd Normal distribution – Chi-square test – Hypothesis test - Student's t-tes t – Correlation and Regression – ANOVA.

UNIT III: Medical Ethics

Bioethics and Medical ethics: Historical perspectives & Introduction to Bioethics, Nuremberg Code, Declaration of Helsinki, Principle of essentiality, informed consent, confidentiality, minimisation of risk, accountability and responsibility. Ethics of clinical trials: Drug trials, vaccine trials, Clinical trials with medical devices/surgical procedures/radioactive materials, Research in transplantation and stem cell therapy. Regulatory framework and guidelines for conduction of human research: Review processes, Institutional ethical committees, composition of committees, review procedures, WHO, UNESCO and ICMR guidelines.

References :

Epidemiology: An Introduction. Kenneth J. J. Rothman. Latest edition / Pub. Date: May 2002. Publisher: Oxford University Press.

Epidemiology. Leon Gordis. Latest edition / Pub. Date: November 2004. Publisher: Elsevier Health Sciences.

Diseases and Human Evolution. Ethne Barnes. Latest edition / Latest edition / Pub. Date: March 2005. Publisher: University of New Mexico Press.

Epidemiology: Beyond the Basics. F. Javier Nieto, Moyses Szklo. Latest edition / Pub. Date: November 2003. Publisher: Jones & Bartlett Publishers, Inc.

Basic and Clinical Biostatistics. Beth Dawson, Robert G. Trapp, Robert Trapp. Latest edition / Pub. Date: March 2004.

Discovering Statistics Using SPSS. Andy Field. Latest edition / Pub. Date: April 2005. Publisher: SAGE Publications.

7.Arora PN & Malhon PK (1996). Biostatistics Imalaya Publishing House, Mumbai.

Sokal & Rohif (1973). Introduction to Biostatistics, Toppan Co. Japan.

Stanton A & Clantz, Primer of Biostatistics — T he McGraw Hill Inc., New York. 10.Government of India. Good Clinical Practices for Clinical Research in India. New Delhi: 2001

6. Indian Council of Medical Research. Ethical Guidelines for Biomedical Research on Human Subjects. New Delhi: 2000

12. United Nations Educational, Scientific and Cultural Organisation (UNESCO). Universal Declaration on Bioethics and Human Rights. Paris; 2005

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