

Subject Code: MRM301T	Subject Title: Research Methodology and Biostatistics
Pre-requisite Subject	-NONE-

Scope:

This course is designed to studying how research is done scientifically. Essentially it is the procedure by which the researchers go about their work of describing, evaluating and predicting phenomenon. It aims to give work plan of research.

Objectives:

At completion of this course it is expected that students will be able to

- Understand a general definition of research design.
- The importance of research education and the audiences that profit from research studies.
- distinguish a purpose statement, a research question or hypothesis, and a research objective
- To define a central phenomenon in qualitative research.
- Know the steps in the process of quantitative data collection.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)		
Lecture	Tutorial	Practical	Credit	Theory(T)		Total Marks
				University Assessment	Continuous Assessment	
4	-	-	4	-	100	100

Subject Contents					
Sr. No.	Topic	Total Hours	Weight (%)		
1	UNIT I General Research Methodology: Research, objective, requirements, practical difficulties, review of literature, study design, types of studies, strategies to eliminate errors/bias, controls, randomization, crossover design, placebo, blinding techniques.	12	20		
2	UNIT II Biostatistics: Definition, application, sample size, importance of sample size, factors influencing sample size, drop outs, statistical tests of significance, type of significance tests, parametric tests (students "t" test, ANOVA, Correlation coefficient, regression), non-parametric tests (wilcoxon rank tests, analysis of variance, correlation, chisquare test), null hypothesis, P values, degree of freedom, interpretation of P values.	12	20		
3	UNIT III Medical Research: History, values in medical ethics, autonomy, beneficence, non-maleficence, double effect, conflicts between autonomy and beneficence/non-maleficence, euthanasia, informed consent, confidentiality, criticisms of orthodox medical ethics, importance of communication, control resolution, guidelines, ethics committees, cultural concerns, truth telling, online business practices, conflicts of interest, referral, vendor relationships, treatment of family members, sexual relationships, fatality.	12	20		

4	UNIT IV CPCSEA guidelines for laboratory animal facility: Goals, veterinary care, quarantine, surveillance, diagnosis, treatment and control of disease, personal hygiene, location of animal facilities to laboratories , anesthesia, euthanasia, physical facilities, environment, animal husbandry, record keeping, SOPs, personnel and training, transport of lab animals.	12	20
5	UNIT V Declaration of Helsinki: History, introduction, basic principles for all medical research, and additional Principles for medical research combined with medical care.	12	20

List of References:

Reference Books:

1. Research in Education- John V. Best, John V. Kahn 7th edition
2. Presentation skills-Michael Hallon-Indian Society for Institute education
3. Practical Introduction to copyright. – Gavin McFarlane
4. Thesis projects in Science & Engineering– Richard M. Davis.
5. Scientist in legal Systems-Ann labor science
6. Thesis & Assignment– Jonathan Anderson
7. Writing a technical paper-Donald Menzel
8. Effective Business Report Writing–Leland Brown
9. Protection of industrial Property rights-P. Das & Gokul Das
10. Spelling for the millions-Edna Furrer
11. Preparation for publication– King Edward Hospital Fund for London
12. Information Technology –The Hindu peaks
13. Documentation–Genesis & Development 3792.
14. Manual for evaluation of Industrial projects-United Nations
15. Manual for the preparation of industrial feasibility studies

e- Resources:

1. <https://www.pharmatutor.org>
2. <https://iare.ac.in/sites/default/files/MTECH-CAD.CAM-R18-RM-IP-NOTES.pdf>
3. <https://www.rpharms.com/>
4. <https://www.rroij.com>
5. <https://pharmaceutical-journal.com>