

Study Scheme and Syllabus of
Doctorate of Philosophy

Syllabus of Common Courses of
Course work of
Doctorate of Philosophy



SLIET LONGOWAL

RM-10000 RESEARCH METHODOLOGY

L	T	P	CREDITS
3	1	0	4

Sessional Marks: 50

End Semester Examination Marks: 50

Unit I

Introduction: Research and scholarship; deference between undergraduate and research education; skill habits and attitudes for research; status of research in India; Psychological phases of Ph.D. process, stress point; aims of supervisors; mismatches and problems.

Managing self; empathy; managing relations with your supervisor; colleagues and supporting staff. Listening; assertiveness; teamwork; sense of humor.

Duration and stages of a Ph.D. process; long term and short goals; time tabling and dead lines.

Profession; integrity, objectivity, fairness and consistency; loyalty; plagiarism and research ethics; safely. Problem finding and literature survey.

Unit II

Survey Based Research: Scope of survey based research, types of surveys- specific, periodic and transition-driven, identification of research problem, analysis of research problem, customer identification, categorization and sampling, planning a survey project- resources, budget and schedule, preparation of questionnaire- elements of questionnaire, sequencing questions, question formats, methods of conducting survey, data collection, analysis and compilation of survey report.

Unit III

Publishing- Patenting and Communication: Difference between publishing and patenting, relative importance of various form of publications; choice of journal and reviewing process, stages in the realization of paper or a patent and how to handle these.

Importance of communication; stages and dimensions of communications process, oral communication- verbal, non verbal, casual, formal and informal communications, interactive communications, listening form; content and delivery, various context for speaking- conference, seminars etc; visual aids, written communication- form, content and language- layout typography and illustration, contexts for writing –paper, thesis, reports etc. Prescription for developing communication skills.

Unit IV

Problem Solving and Creativity:

- (a) **Thinking processes problem solving and creativity:** Level and styles of thinking; common sense and scientific thinking; examples, problems solving strategies- reformulation or rephrasing; techniques of representation, logical thinking, division into sub problems, verbalization awareness of scale; importance of graphical representation; examples. Creativity- some definitions, illustrations from day to day life; gift or skill creative process, requirement of creativity- role of motivation and open vs closed minds; multiple approaches to a problem analytical vs analogical reasoning, puzzle solving; example; prepared mind. Creative problem solving using Triz. Prescriptions for developing creativity and problem solving.
- (b) **Experimental and Modeling Skills:** Introductions, selection of variables, design matrix, 2-level factorial design, 3-level factorial design, fractional factorial design, analysis of variance, Taguchi methods- orthogonal arrays, signal to noise ration; response surface. Methodology, latest trends in experimental designs.

RECOMMENDED BOOKS:

1. How to get a Ph.D.- a handbook for Ph.D. students and their supervisors; E M Phillip and D S Pugh; Viva books Pvt Ltd
2. Hand book of Science Communication; Antony Wilson, Jane Gregory, Steve Miller, Shirely Earl; Overseas Press India Pvt Ltd, New Delhi, First Edition 2005
3. Practical Physics; G L Squires; Cambridge University Press
4. Advice to a Young Scientist; Peter b Medewar; Pan Books, London, 1979
5. Design and Analysis of Experiments; D C Montgomery
6. Survey Guidebook; Fred Van Bennekom



SLIET LONGOWAL

RPE 10000 - Research and Publication Ethics

L T P CREDITS
2 0 0 2

Unit	Main Topics	Course outlines	Lecture (s)
Unit-1 (Theory)	RPE 01	PHILOSOPHY AND ETHICS 1. Introduction to Philosophy : definition, nature and Scope, Concept, Branches 2. Ethics: definition, moral philosophy, nature of moral judgements and reaction	04
	RPE 02	SCIENTIFIC CONDUCT 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	04
	RPE 03	PUBLICATION ETHICS 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	07
Unit-2 (Practice)	RPE 04	OPEN ACCESS PUBLISHING 1. Open access publications and initiatives 2. SHEERPA/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.	04
	RPE 05	PUBLICATION MISCONDUCT <i>A. Group Discussions</i> 1. Subject specific ethical issues, FFP, authorship 2. Conflicts of interest 3. Complaints and appeals: examples and fraud from India and abroad <i>B. Software tools</i> Use of plagiarism software like Turnitin, Urkund and other open source software tools	04
	RPE 06	DATABASES AND RESEARCH METRICS <i>A. Databases</i> 1. Indexing databases 2. Citation databases: Web of Science, Scopus, etc. <i>B. Research Metrics</i> 1. Impact Factor of Journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score 2. Metrics: h-index, g index, i10 index, altmetrics	07

Total=30

Recommended Books:

- Bird, A.(2006). Philosophy of Science. Routledge.
- MacIntyre, Alasdair (1967) A Short History of Ethics. London
- P.Chaddah, (2018) Ethics in Competitive Research: Do not get Scooped; do not get Plagiarized, ISBN :978-9387480865
- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). On Being a Scientist: A Guide to responsible conduct in Research: Third Edition, National Academies Press.
- Resnik, D.B.(2011) What is ethics in research & why is it important. National institute of Environmental Health Science, 1-10 Retrieved from <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm>
- Beall, J: (2012) Predatory publishers are corrupting open access. Nature, 489(7415), 179-179. <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance (2019), ISBN:978-81-939482-1-7. https://www.insaindia.res.in/pdf/Ethics_Book.pdf