Scheme & Syllabi

for

Pre-Ph.D. (Printing Technology)

(Total Credits =12)

Department of Printing Technology

Guru Jambheshwar University of Science & Technology,
Hisar-125001
July-2022 Onwards

Pre-Ph.D., Printing Technology (*Scheme*)

Code	Subject	L	T	P	Credit
PPD-101	Research Methodology	4	-	-	4.0
PPD-102	Review of Literature and Seminar (In the relevant research area)	2	-	-	2.0
PPD-103	Quality Control in Printing Technology (Departmental Course)	4	-	-	4.0
PPD-104	Research and Publication Ethics	2	-	-	2.0
	Total	**12**	**-**	**-**	**12.0**

Pre-Ph.D. (*Syllabi*)

PPD-101: RESEARCH METHODOLOGY

		L	T	P	Credit
Assessment during Semester:	30 marks				
Assessment at the end of Semester:	70 marks	4	--	--	4.0

Research Methodology: Nature, objectives and motivation of research, types of research, research approaches, significance of research, scope and formulation of hypothesis, research and scientific method, important of research methodology, research process, criteria of good research, problems encountered by researches in India, benefits to the society in general, Defining the research problem: definition of research problem, problem formulation, necessity of defining the problem, technique involved in defining a problem.

Statistical analysis and probability distribution: Measure of central tendency and dispersion, mean, median, mode, range, mean deviation, standard deviation and problems, discrete, continuous and mixed random variable, definition of probability, addition rules and condition probability, binomial, poisson, sampling and geometric distributions, sample tests: Chi square test

Research Design and Modeling: Meaning of research design, need of research design, feature of a good design, important concepts related to research design, different research designs, basic principles of experimental design, developing a research plan, design of experimental set-up, use of standards and codes, type of models, model building and stages, need and types of simulation

Research Report Writing: Format of the research report, synopsis, dissertation, thesis its differentiation, references/bibliography, technical paper writing/journal report writing, making presentation, use of visual aids, Research proposal preparation: writing a research proposal and research report, writing research grant proposals. Computer Application for presentation: basic presentation skills for documentation and presentation tools: PowerPoint, Microsoft office, and knowledge of online tools.

Text & Reference Books:

1. C.R. Kothari, Research Methodology, Methods and Techniques, New Age International Publishers 2004
2. R. Ganesan, Research Methodology for engineers, MJP Publishers, 2011.
3. Ratan Khananabis and Suvasis Saha, Research Methodology, University Press, Hyderabad, 2015

4. Y.P. Agarwal, Statistical Methods: Concepts, Application and Computation, Sterling Publs. Pvt. Ltd., New Delhi, 2004
5. Vijay Upagade and Arvind Shende, Research Methodology, S. Chand & Company ltd., New Delhi 2009
6. Y.K. Singh, Fundamentals of Research Methodology, New Age International Publishers 2006
7. Ranjit Kumar, A step by step guide for beginners, Pearson Education 2005.
8. Meyer, P.L. Introductory Probability and Statistical Applications, Addison Wesley (1970).
9. Research Methodology; Integration of Principles, Methods and Techniques (Pearson Education, New Delhi)

Note: Paper setter will set eight questions taking at least one from each unit. Students are required to answer five questions.

PPD-102: REVIEW OF LITERATURE & SEMINAR

		L	T	P	Credit
Assessment during Semester:	30 marks				
Assessment at the end of Semester:	70 marks	2	--	--	2.0

The student will be required to do the review of literature work (ranging between 20-30 papers) under the guidance of the senior faculty member(s)/supervisor concerned and to present their work in form of seminar before the committee constituted by Dean, FET for evaluation.

Detailed Contents

Literature survey: Overview – What is literature survey, Functions of literature survey, maintaining a notebook, developing a Bibliography, Searching for publications – Publication databases, search engines and patent databases, Find some/all of the references for a given paper, including those that are not on the web.

How to study a scientific paper: Summarizing papers already published: – Reading abstracts and finding ideas, conclusion, Advantages of their approach, the drawbacks of the papers (What is lacking – can be found in the sections such as future work) Generalize results from a research paper to related research problems, Comparing the approach - Identify weaknesses and strengths in recent research articles in the subject.

Publishing a paper: How to write a scientific paper, Structure of a conference and journal paper, abstract writing, chapter writing, discussion, conclusion, references, bibliography and In-class discussion of technical writing examples, Poster papers, review paper, Research ethics – Legal issues, copyright, plagiarism, General advice about writing technical papers in English - Tips for writing correct English.

NOTE: *Every student will be required to collect minimum 20-30 research papers related to the broad area of research. The area of research will be decided by the course coordinator of the Departmental Elective subject and the relevant research papers should be from the reputed journals. A report consisting of the summary of these research papers is required to be submitted at the end of the semester. The final evaluation shall be done on the basis of Seminar and report submitted. The continuous assessment will be done by the Course Coordinator on the basis of efforts made by the candidate for collecting the relevant quality research papers.*

Text & Reference Books:

1. Lecture Notes and presentations

PPD-103: Quality Control in Printing Technology

Assessment during Semester:	30 marks	**L**	**T**	**P**	**Credit**
Assessment at the end of Semester:	70 marks	4	--	--	4.0

Unit-I

1. Introduction to Printing Technology
2. Different Printing Techniques.
3. Merits, demerits and applications of different printing systems.

Unit-II

1. Process requirements (Substrates, ink, image carrier, press chemicals, printing machines, etc.)
2. Raw material testing methods and application.
3. Image carrier preparation methods.

Unit-III

1. Quality control, Quality Assurance & Quality management.
2. Print quality control methods and application.
3. Quality control aids and equipments.

Unit-IV

1. Enhancing print quality of conventional and digital printing.
2. Quality control and print productivity
3. Latest developments in Print quality control systems.

Text & Reference Books:

1. Miles South worth and Donna South worth. Quality and Productivity in the Graphic Arts. Graphic Arts Publishing Company(1980).
2. Douglas C. Montgomery, Introduction to Statistical Quality Control, John Wiley(1985).
3. Brian Rothery, ISO 9000, Productivity and Quality Publishing Private Ltd.
4. Kelvin Tritton, Colour Control for Lithography, PIRA International.
5. Mortimer, AColour Reproduction in Printing Industry PIRA International.
6. Phil Green Quality Control for Print Buyers, blue Print.
7. J.P Casey (Ed) Pulp and Paper Chemistry and Chemical Technology, Vol II Wiley Inter science.
8. Ronald E. Todd, Printing Inks – Formulation Principles, Manufacture and Quality Control Testing Procedures. PIRA International.
9. H.L Apfelberg and M.J. Apfleberg, Implementing Quality Management in Graphic Arts, GATF.

PPD-104: RESEARCH & Publication Ethics

		L	T	P	Credit
Assessment during Semester:	30 marks				
Assessment at the end of Semester:	70 marks	2	--	--	2.0

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 Tumitin, 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

Text & Reference Books:

Bird, A. (2006). *Philosophy ofscience*. Routledge.
MacIntyre, Alasdair (1967) *A Short History ofEthics*. 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 ofEnvironmental Health Sciences,* 1-10. Retrieved from https://www.niehs.nih. ov(research/resources/bioethics/whatis/index.cfm
Beall, J. (2012). Predatory publishers are comipting open access. Nature, 489(7415), 179—179. https://dot.org/10.1038/489179a
Indian National Science Academy (INSA), Ethics in Science Education, Research and Governance(2019), ISBN:978-81-939482-1-7. http://www.insaindia res.in/pdf/Ethics Book.pdf