

SCHEME OF COURSE WORK

Course Title	Research Methodology and Intellectual Property Rights		
Course Code	19HM2101	L P C	: 2 0 2
Program:	M.Tech.		
Specialization:	Thermal Engineering		
Semester	I		

Course Outcomes (COs):

At the end of the course, the student will be able to

1	Illustrate research problem formulation.
2	Analyze research related information and research ethics
3	Summarize the present day scenario controlled and monitored by Computer and Information Technology, where the future world will be ruled by dynamic ideas, concept, creativity and innovation
4	Explain how IPR would take such important place in growth of individuals & nation, to summarize the need of information about Intellectual Property Right to be promoted among student community in general & engineering in particular.
5	Relate that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.

Program Outcomes (POs)

At the end of the program, the students in CAD/CAM will be able to

1. acquire fundamentals in the areas of computer aided design and manufacturing
2. apply innovative skills and analyze computer aided design and manufacturing problems critically
3. identify, formulate and solve design and manufacturing problems
4. carry out research related to design and manufacturing
5. use existing and recent CAD/CAM software
6. collaborate with educational institutions, industry and R&D organizations in multidisciplinary teams
7. apply project and finance management principles in engineering projects
8. prepare technical reports and communicate effectively
9. engage in independent and life-long learning and pursue professional practice in their specialized areas of CAD/CAM
10. exhibit accountability to society while adhering to ethical practices
11. act independently and take corrective measures where necessary

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO-1			M					M	M		
CO-2									M	S	
CO-3		S		M			M				
CO-4						S					M
CO-5											M

S - Strongly correlated, *M* - Moderately correlated, *Blank* - No correlation

S - Strongly correlated, *M* - Moderately correlated, *Blank* - No correlation

Assessment Methods

Seminar/Mid-Test/End Exam

Teaching-Learning and Evaluation

Week	TOPIC/CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Meaning of Research, objectives of research, Research methods and methodology, research approaches, types of research.	CO-1	a) Explain the difference between Research method and Research Methodology. b) Why do you understand research problem? c) What are the objectives of research problem?	Lecture / Discussion	Seminar (Week 2 - 4) Mid-Test 1 (Week 12)
2	Importance of knowing how to conduct research, source of research problem, criteria and characteristics of a good research problem, qualities of researcher.	CO-1	a) Explain the criteria for good research? b) What are the sources of research problem?	Lecture / Discussion	Seminar (Week 2 - 4) Mid-Test 1 (Week 12)
3	Significance of research. Research process, elements of research problem, errors in selecting a research problem.	CO-1	a) What are the common errors committed by researchers in selecting research problem? b) Explain the significance of research problem	Lecture / Discussion	Seminar (Week 2 - 4) Mid-Test 1 (Week 12)
4	Scope and objectives of research problem, concepts relating to research design, data collection and source of data, methods of collecting data, analysis, interpretation, Necessary instrumentations.	CO-1	a) What are the different methods of data collection? b) How would you differentiate between primary and secondary data.	Lecture / Discussion	Seminar (Week 2 - 4) Mid-Test 1 (Week 12)
5	Literature review definition, purpose of literature study, literature review designs, when we need to do literature study, what is literature.	CO-2	a) What are the various means of conducting literature survey? b) Discuss the importance of critical literature review.	Lecture / Discussion	Seminar (Week 5 - 8) Mid-Test 1 (Week 12)
6	Types of literature, Searching and finding literature, Evaluating literature, Analyzing literature, Writing and presenting literature review.	CO-2	a) Classify various types of literature and how to analyze literature. b) Explain the process of stating the problem definition based on literature review.	Lecture / Discussion	Seminar (Week 5 - 8) Mid-Test 1 (Week 12)
7	Etymology, legal aspects, forms of academic plagiarism, types of plagiarism, tips to avoid plagiarism, self-plagiarism and reverse plagiarism.	CO-2	a) What is plagiarism? b) What are the common forms of plagiarism in research report?	Lecture / Discussion	Seminar (Week 5 - 8) Mid-Test 1 (Week 12)
8	Ethical issues in conducting research, respect for anonymity and confidentiality, respect for privacy, vulnerable group of people, principles of research ethics, importance of research ethics.	CO-2	a) How can you justify the ethics in good research? Explain confidentiality. b) What is ethics in research? Why it is important? c) What are the five principles of research ethics?	Lecture / Discussion	Seminar (Week 5 - 8) Mid-Test 1 (Week 12)
9	Meaning of interpretation, Technique of interpretation, significance of report writing,	CO-3	a) Explain the essential features of report writing.	Lecture / Discussion	Seminar (Week 5 - 8) Mid-Test 1

	different steps in report writing, layout of the research report.		b) What are the items in research report?		(Week 12)
10	Types of reports, Mechanics of writing a report, precautions for writing research report.	CO-3	a) Explain the significance of research report. b) Explain the characteristics of research report	Lecture / Discussion	Seminar (Week11-14) Mid-Test 1 (Week 12)
11	What is research proposal, purpose of research proposal, structure of research proposal, presentation of research proposal, essentials of good research proposal, review committee processes, evaluation of qualitative proposal.	CO-3	a) What are the steps involved in writing research proposal? b) Explain the process of evaluating qualitative research proposal.	Lecture / Discussion	Seminar (Week11-14) Mid-Test 1 (Week 12)
12	Mid-Test 1				
13	Types of intellectual property, trademarks and service marks, registration of trademarks, copyrights and registration of copy rights.	CO-4	a) How do you select good trade mark? b) Write short notes on i) trade mark, ii) Copyright.	Lecture / Discussion	Seminar (Week16-17) Mid-Test 2 (Week 18)
14	Trade secrets, protection of trade secrets, international trade mark association, Industrial Designs. Types of patents, registration of patents, patent law	CO-4	a) State the functions of International trade mark association. b) Explain the procedure for registration of patents. c) How can Industrial design be protected?	Lecture / Discussion	Seminar (Week16-17) Mid-Test 2 (Week 18)
15	Procedure for grant of patents, patenting and PCT, advantages of patents	CO-4	a) What are the criteria of patentability? b) What kind of information is presented in patent document?	Lecture / Discussion	Seminar (Week16-17) Mid-Test 2 (Week 18)
16	Scope of patent rights, Licensing and transfer of technology, why transfer of technology, requirements for transfer of technology, Patent information and data base.	CO-5	a) Explain the requirements for transfer of technology. b) What are the benefits of Technology transfer for society? c) Explain how various countries worldwide organizing	Lecture / Discussion	Seminar (Week16-17) Mid-Test 2 (Week 18)
17	Geographical indication, new developments in IPR, Administration of patent system, IPR of biological systems and computer softwares.	CO-5	a) List four Geographical indication tagged products in India. b) Discuss new developments in Patent law. c) What type of inventions are not patentable in India.	Lecture / Discussion	Seminar (Week16-17) Mid-Test 2 (Week 18)
18	Mid-Test 2				