

Subject Code : 1CS2010410	Subject Title: RESEARCH METHODOLOGY AND TECHNICAL COMMUNICATION (Non Credit Course)
Pre-requisite :	-

Course Objective:

The prime objective of this course is to bring research orientation amongst the post graduate scholars. The course aims to acquaint the scholars with essentials of research methodology and technical communication. Particularly, the course aims at introducing them to the basic concepts used in engineering research and technical drafting. It also aims to provide technical communication required for various subjects such as projects, seminars and dissertation during presentation, report/paper writing, defending their work etc. Some other objectives of the course are:

- To understand of the fundamental structure of research procedure.
- To understand of various research designs and techniques involved in engineering.
- To identify various sources of information for literature review and data collection.
- To understand the drafting technical documentation including research paper/thesis/articles/reports.
- To understand issues such as ethics, internet communication, gender & diversity issues etc. pertaining to technical communication.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	-	-	-	-	-	-	-

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Research Process Overview: Understanding the language of research – Concept, Construct, Definition, Variable. Research Process.	3	12
2	Problems and Hypotheses – Defining the research problem, Formulation of the research hypotheses, The importance of problems and hypotheses	3	11
3	Research design – Experimental and Non-experimental research design, Field research, Survey research. Qualitative and Quantitative Research	3	11
4	Methods of data collection – Secondary data collection methods, qualitative methods of data collection, and Survey methods of data collection. Research data analysis and representation (plot, figures, tables, errors bars)	3	11
5	Essence of Technical Communication: Analogy of Question/Answer to Problem/Solution. Steps in technical communication and practical guidelines.	3	11
6	Organization of technical report: Title, Authors, Affiliation, Abstract, Introduction, Literature survey, Methods, Result, Discussion, Conclusion, References.	3	11
7	Three pass reading. Effective communication – Teacher/Student perspective. Listening – Hearing Vs. Listening. Notes Taking. Elevator Pitch. Technical writing.	3	11
8	Wisdom of Internet Communication. Gender and diversity issues and stereotypes used in technical communication.	3	11
9	Ethical issues in computer science research	3	11

Review Presentation: The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to carry out list of assignment mentioned beneath related to the area of your interest. Student is supposed to view various video lectures (E.g. NPTEL) available in the domain identified. Student is required to make a review-presentation on the work carried out for the same.

Course Outcome:

At the end of this course, the student would be able

- To understand the process of research
- To identify problems in his/her domain
- To define hypothesis and test it
- To collect data and analyze & process the data scientifically
- To understand different components of research papers
- To understand notes taking, paraphrasing, elevator pitch, gender & diversity issues and ethical issues in technical communication

List of References:

1. <http://dl.acm.org/>
2. <http://springer.com/>
3. <http://sciencedirect.com/> (<http://elsevier.com/>)
4. <http://ieeexplore.ieee.org/>
5. <https://scholar.google.co.in/>
6. <https://www.scopus.com/>
7. <https://iitbombayx.in/>

E-Resources / Web Links

1. <http://courses.writing.ufl.edu/3254/Textbook/Lannon%20Instructor%20Manual%2012e.pdf>
2. <http://www.limat.org/data/research/Research%20Methodology.pdf>
3. http://www.sociology.kpi.ua/wp-content/uploads/2014/06/Ranjit_Kumar-Research_Methodology_A_Step-by-Step_G.pdf
4. <http://www.ndc.gov.ng/Lectures/Research-Methodology.pdf>

List of Reference Books

1. C. R. Kothari, "Research Methodology: Methods and Techniques", New Age International Publishers
2. Raman, Meenakshi and Sangeeta Sharma, "Technical Communication: Principle and Practice", Oxford University Press.

List of Assignments:

1. Searching criteria/techniques for relevant research papers (search by domain, time interval, keyword, title, authors etc)
2. Understanding terminology such as Impact factor, H factor, Bibliography, References, Citation etc.
3. Identify 5 research papers of your interest preferably from above reference sites. Identify and understand the sections: Title, Authors, Affiliation, Abstract, Introduction, Literature survey, Methods, Result, Discussion, Conclusion, and References.
4. For the 5 research papers identified above,
 - a. Classify the abstracts among: General domain statement, problem/gap/challenge/issue in the domain, other researchers' work, authors' contribution, comparison of authors work with other, utility/applicability of the research, future scope.
 - b. Read the conclusion and compare with abstract.
 - c. Paraphrase (rewrite the same contents in your own words) for the abstracts.
 - d. Identify tools and techniques used by the authors for experimentation.
5. Understand the difference between paraphrasing and plagiarism.
6. Write an elevator pitch describing you and compare the same with your co-student.
7. Draft various emails such as (i) to your friend (ii) to your research supervisor (iii) to a company for job application (iv) to an editor of a conference (v) to your principal, with relevant subjects. The emails should include (i) greetings and/or your introduction (ii) addressing the recipient (iii) signing off (iv) signature etc.