

Sankalchand Patel University
Faculty of Engineering and Technology
First Year Master of Technology in Civil Engineering
(Computer Aided Structural Analysis and Design)
In Effect from Academic Year 2023-24

Branch Name:	Civil Engineering (Computer Aided Structural Analysis & Design)
Semester/Year:	Semester I/ First Year
Subject Title:	Research Methodology and Technical Communication
Subject Code:	2ET2000101T
Pre-requisite:	Knowledge of access to referred journals

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
2	2	0	0	2	00	00	16	40	00	00	00	00	40

Course Objective:

1. To conduct and present research in engineering
2. To understand different components of research papers
3. To understand notes taking, paraphrasing, elevator pitch, gender & diversity issues and ethical issues in technical communication.

Subject Contents				
Sr. No	Topic	Total Hours	Weightage (%)	
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 engineering 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

1. To understand the process of research
2. To identify problems in his/her domain



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3. To define hypothesis and test it
4. To collect data and analyze & process the data scientifically
5. To understand different components of research papers
6. To understand notes taking, paraphrasing, elevator pitch, gender & diversity issues and ethical issues in technical communication.

Open Ended Problems:

Apart from above tutorials/experiments a group of students has to undertake one open ended problem/design problem few examples of the same are given below:

1. Modeling and response of structure like high-rise buildings, water tanks and bridges subjected to earthquake loading using open source/professional software's.
2. Earthquake resistant design of masonry structure.
3. Development of models for ductile detailing of beam, column, beam-column joint etc.

List of References:

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

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_StepbyStep_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
 - b. researchers' work, authors' contribution, comparison of authors work with other, utility/applicability of the
 - c. research, future scope.
 - d. Read the conclusion and compare with abstract.
 - e. Paraphrase (rewrite the same contents in your own words) for the abstracts.
 - f. Identify tools and techniques used by the authors for experimentation.
5. Understand the difference between paraphrasing and plagiarism.



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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.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To understand the process of research	L-1 and L-2
CLO2	To identify problems in his/her domain	L-3 L-4 and L-5
CLO3	To define hypothesis and test it	L-5
CL04	To collect data and analyze & process the data scientifically	L-4 and L-5
CL05	To understand different components of research papers	L-2, L-3 and L4
CL06	To understand notes taking, paraphrasing, elevator pitch, gender & diversity issues and ethical issues in technical communication.	L-2 and L-3

L1- Remember, L2- Understand, L3- Apply, L4- Analyze, L5- Evaluate, L6- Create

Mapping of CLOs with POs & PSOs

	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
Course Learning Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CLO1	M	M		M		M			M				M		
CLO2	M	M	M	M		M			M				M		
CLO3	M	M	M	M	H	M		M	M			H	M	H	
CL04	M	M	M	M	H	M		M				M	M	M	
CL05	M	M	M	M	H	M		M				M	M	M	
CL06	M	M		M		M		M				M			

H: High, M: Medium, L: Low