

Title (Units): **COMP 7160 Research Methods in Computer Science (3,3,0)**

Course Aims: To introduce research and principal research methods in Computer Science; To explain the skills of writing and publishing research papers; To examine examples drawn from different research areas as case studies on various aspects of the principal methods.

Prerequisite: NIL

Course Intended Learning Outcomes (CILOs):

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Explain the basics of research in Computer Science
2	Describe the principal research methods in Computer Science
3	Identify the importance of the research ethics
	Professional Skill
4	Develop skills of writing and publishing research papers in Computer Science
5	Apply appropriate research methods to conduct research in Computer Science

Calendar Description: This course aims to prepare students for advanced research by examining how to plan, conduct, and report on research in the Computer Science field. Students will learn the methods involved in each step of a research project, including formulating research problems, problem solving techniques, theoretical/empirical validation, and publishing. Students will also examine examples drawn from different research areas as case studies on various aspects of the principal methods.

Teaching and Learning Activities (TLAs):

CILOs	TLAs
1-4	Students will acquire the research methods, skills, and knowledge through lectures, case studies, paper reading and presentation assignments.
5	Students will work on a research project to gain research experience.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Remarks
1	Continuous Assessment	100%	1-5	Paper reading and presentation assignments are designed to test students' understanding of the principal research methods. A research project is designed to assess how well students acquire research skills. Proposed breakdown (could be adjusted according to the instructors' specific requirements): <ul style="list-style-type: none">• Research project assignment 40%• Paper reading and presentation 30%• Survey writing 30%

Rubrics:

	Excellent (A)	Good (B)	Satisfactory (C)	Fail (F)
Explain the basics of research in Computer Science	Thorough explanation of the basics of CS research	Explanation of most of the basics of CS research	Explanation of some basics of CS research	Explanation of little basics of CS research

	Excellent (A)	Good (B)	Satisfactory (C)	Fail (F)
Explain the principal research methods in Computer Science	Thorough explanation of almost all CS research methods	Explanation of most of the CS research methods	Explanation of some of the CS research methods	Explanation of a very limited number of CS research methods
Have a thorough understanding of the research ethics	Thorough understanding of the research ethics	Good understanding of the research ethics	Limited understanding of the research ethics	Bare understanding of the research ethics
Develop skills of writing and publishing research papers in Computer Science	Demonstration of excellent skills of writing research papers	Demonstration of good skills of writing research papers	Demonstration of satisfactory skills of writing research papers	Demonstration of very limited skills of writing research papers
Apply appropriate research methods to conduct research in Computer Science	Mastery of appropriate research methods to conduct CS research	Good application of appropriate research methods to conduct CS research	Application of some research methods to conduct CS research	Failed application of research methods to conduct CS research

Course Intended Learning Outcomes and Weighting:

Content	CILO No.
I. Basics of Research	1
II. Planning Research	2, 5
III. Conducting Research	2, 5
IV. Writing and Publishing Papers	4, 5
V. Research Ethics	3
VI. Case Studies	1-5

References:

John W. Creswell and J. David Creswell. Research Design. Qualitative, Quantitative, and Mixed Methods Approaches, Sixth Edition, SAGE Publication, 2022.

Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams, Joseph Bizup, and William T. FitzGerald. The Craft of Research, Fourth Edition, University of Chicago Press, 2016.

Charles Ling and Qiang Yang. Crafting Your Research Future: A Guide to Successful Master's and Ph.D. Degrees in Science & Engineering, Morgan & Claypool Publishers, 2012.

William Strunk Jr. and E. B. White. The Elements of Style, Fourth Edition, Pearson, 1999.

R. Panneerselvam. Research Methodology, 2nd Edition, PHI, 2014.

Philip Guo. The Ph.D. Grind, Online Book, 2012.

Ref: <https://www.youtube.com/watch?v=zHp2rxR2LTc>

Course Content in Outline:

Topic

- I. Basics of Research
- II. Planning Research

III. Conducting Research

IV. Writing and Publishing Papers

V. Research Ethics

VI. Case Studies