

University of Pune
Department of Computer Science

Ph.D. Course work in Computer Science

Important to Note:

- There will be three courses for every candidate enrolled for Ph.D. in Computer Science.
- The Head, Department of Computer Science will be the coordinator for the Ph.D. Course work (teaching program).
- It is essential for every student to pass/complete all these three courses to continue for the Ph.D. research work.
- PHD-CS-102 course contents will be decided from the broad areas of Computer Science and will be proposed by the Departmental Committee for every session of Ph.D. Programme.
- A course PHD-CS-103 will be handled and evaluated by the concerned guide of the student.
- The Examination coordinator of the Department of Computer Science will keep the records of the evaluation of all the courses and accordingly the Grade Points will be awarded by the Head, Department of Computer Science and accordingly the result will be declared.

PHD-CS-101: Research Methodology

Mode of study includes:

Course will review the major considerations and tasks involved in conducting scientific research, particularly in the area of Computer Science. It introduces the essential aspects of designing, supporting, and conducting a research project. Those who successfully complete the course will be able to: produce a well-developed research proposal; select an appropriate methodology with which to conduct the research and defend the methodology of their selection; understand the various tasks required to carry out the research; find the resources needed to guide them through the research process and the documentation of its findings. There will be rigorous continuous assessment process for this course.

Course objectives

1. Discuss major categories, techniques, and processes of doing research in Computer science.
2. Design the use of major experimental methods of Computer Science research, especially surveys, testing, comparisons, case studies, and experiments.
3. Implement a small research project in an area of computer science.
4. Present and report on research in acceptable manner for the computer science research community.

Assignments

1. Paper Critique/Review & Summary.
2. Writing formal research proposal.
3. Evaluating a Software Process / Product.
4. Maintaining a personal website/webpage(s) to record all the activities performed in this course.

End Term Evaluation

1. Writing of a formal Research Paper in IEEE / ACM style on topics assigned by the Department.
2. The Research Paper written at 1 will be given to the respective student for answering the questions in respect of their self assessment.
3. Presenting a paper in a conference setup arranged for the class.

Tentative Course outline

1. Introduction
2. The objectives and dimensions of research: Why Research? What is research? How is research done?
3. Tools of research: Library, The internet, Measurements for Computer Science research, Statistics, Data analysis tools
4. The research problems: Finding a problem, stating the problem, identifying sub-problems.
5. Review of related literature: Why review the literature? Including literature in research proposal.
6. Critique, Survey & Peer review process.
7. Planning the research project: The scientific method, Research planning, Data analysis.
8. Conducting research in computer science: Software and hardware implementation, debugging, and evaluation.
9. Proposal writing / presentation workshop
10. Research methodology: Quantitative and qualitative approach
11. Writing the research papers: Characteristics of a paper, Weaknesses of proposals
12. The Quantitative study
13. Final paper presentation

Textbook (tentatively)

Research Papers, web sites, lecture slides / presentations and notes provided from time to time.

PHD-CS-102: Departmental Course

One course will be based on the contents from broad areas of Computer Science listed below. The course including contents and title will be finalized in the Departmental committee meeting for each session.

1. Formal Methods: Predicate Logic and Model Theory, Program Correctness, Horare Logic, Program Semantics and Model Checking.
2. Foundations of Computing
3. Software Systems
4. Parallel and Distributed Systems

PHD-CS-103: Special Course

This course will be handled by the Guide/Supervisor of the respective student. Concerned guide will assign topics for review writing other than the topic of Ph.D. Student and the students will have to submit the review to HOD/Director of the Research Center which will be assessed by an expert. This will be followed by presentation and will be assessed by group of teachers.

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