

**Draft of Guide to PhD Comprehensive Exam
Department of Computer Science and Engineering
University of Colorado Denver**

The PhD Comprehensive Exam is intended to test student's capability to complete, with guidance, key research in computer science. Performance on the exam should reflect the student's knowledge of relevant literature, current research within the scope of his/her area of research focus, and a plan to conduct research toward the goal of defining, implementing, and completing a PhD research dissertation in CS.

The Comprehensive Exam must be taken upon completion of student's coursework, within a year or two of passing the qualifying Preliminary Exam, and completed within three years of admission to the PhD program (at most 10 credits of dissertation hours may be completed). The student must have a recommendation from their faculty advisor to the committee.

The PhD Comprehensive exam consists of a written paper. The written paper must be submitted to the PhD Comprehensive Committee at least two weeks prior to the exam. This gives the committee sufficient time to carefully evaluate the paper. Students have two options to pass the written section of the Comprehensive exam:

1. **Peer Refereed Publication:** The student has been accepted for publication in a high quality and peer-reviewed research paper. The student must be the first author or the main author as identified by their advisor. The paper must be accepted while the student is enrolled at CU Denver and working with their current advisor. In this case, with recommendation of student's faculty advisor and approval of the student's PhD Comprehensive Committee the student has successfully satisfied the PhD Comprehensive Exam requirement.
2. **Research Topic Survey Paper:** The paper will provide an overview of the state of the art (a survey of literature) which will demonstrate that the candidate has a good grasp of the relevant research in his/her chosen field. Must address challenges in the field of proposed research, current methodologies/solutions being proposed to address these challenges, their shortcomings, and research problems that student may pursue in the course of his/her dissertation. The paper should propose a tentative research plan (outline and timeline) which includes defining the scope of dissertation, steps to produce expected results leading to a satisfactory successful dissertation, and potential contributions. The paper must have enough depth to reflect student's knowledge of the field. The survey paper requirement can also be met through a publication under review, with advisors approval and recommendation.

The Ph.D. comprehensive committee membership must satisfy the CSE Department's guidelines for PhD comprehensive exam requirement.

An Application for Candidacy form and exam request form must be completed according to the Graduate School Rules at least two weeks prior to the exam.

Guidelines on how to write the Comprehensive Exam paper:

- A balance must be struck between satisfying space limitations and providing the most critical information. The paper should be between 15 and 25 pages (single-spaced). Bibliographic references are not included in this page count (having more references is encouraged).
- Three high-level criteria are usually used in evaluating potential success of a proposal. While at this stage, the paper is mostly being evaluated for potential success of student, it will be good to keep the following criteria in mind as you develop your research:
 - Intellectual merit: What is the importance of the activity to advancing knowledge or understanding?
 - Expected impact: What impact can be expected in terms of particular research communities and on society in general?
 - Feasibility: How likely are the stated goals to be achieved by the candidate?
- Based on these criteria, it is advisable for the paper to contain:
 - An overview of the state of the art, which helps to show that the candidate has a good grasp of the relevant research fields.
 - A brief summary of research results obtained so far by others (and the candidate if applicable, but not necessary).
 - A clear description of the remaining problems and goals (challenges in the field, student's goal in tackling problems the research field).
 - Some details of the current and related technical approaches.
 - Clear arguments as to why the work is interesting in terms of intellectual merit and expected impact.
 - An explanation of how the goals may be accomplished within the expected amount of time. (Tentative plan; roadmap to accomplish dissertation; expected results and contributions).