Comprehensive Exam Guide for Students

Explanation

The purpose of the comprehensive exam in a PhD program is to determine the preparedness of students to perform tasks composing the scientific research process: demonstrate knowledge in core areas of their specific emphasis, reading and understanding relevant scientific literature, determining a relevant research question, performing experiments such that the research question can be answered, writing and publishing the results, and presenting results orally. Moreover, due to the specific nature of the PhD in Computing program, the research questions generally include novel implementations of computational methods.

Elements

The comprehensive exam comprises four elements:

1. **Emphasis core courses**: The purpose of this requirement is for the students to have a breadth of knowledge and practical understanding in their particular emphasis area.
2. **Synthesis paper**: The purpose of this requirement is to prepare the students early on their scientific reading and writing abilities.
3. **Computing artifact**: As the program grants a PhD in Computing, the purpose of this requirement is that students who graduate from this program will be able to make a contribution in their respective emphasis areas through computation.
4. **Oral presentation**: This is a presentation of the content of the synthesis paper and a formal examination on advanced knowledge necessary for the synthesis paper and computing artifact.

Procedure

**Emphasis Core Courses**

Before taking the comprehensive exam you must **must earn a B or better** in 3 specific courses prior to the end of the semester in which you take COMPUT 691- Comprehensive Exam.

The courses for each emphasis area are as follows:

- **Computational Science and Engineering:**
  - CS 507 Computing Foundations for Computational Science,
  - MATH 566 Numerical Methods II, and
  - MATH 572 Computational Statistics.
- **Computer Science:**
○ CS 521 Design and Analysis of Algorithms or CS 561 Theory of Computation,
○ CS 554 Advanced Operating Systems, and
○ CS 573 Advanced Software Engineering.

● Cyber Security:
○ CS 567 Applied Cryptography or both MATH 508 Advanced Public Key
  Cryptology and MATH 509 Symmetric Key Cryptology,
○ CS 575 Software Security, and

Registration and Exam Committee
Once you and your advisor agree on your preparedness to take the comprehensive exam you will complete the Appointment of Comprehensive Exam Committee form and formalize the members of the committee who will review all elements of your exam.

*This form should be completed and returned to the program coordinator before the end of the second week of the semester. Once completed the program coordinator will issue you a permission number to enroll in COMPUT 691.

The Appointment of Comprehensive Exam Committee form can be found on the program website at http://computing.boisestate.edu/academic-forms/

Your comprehensive exam committee will include the following members:
● Your Major Advisor
● 1 faculty member from your area of emphasis
● 1 faculty member from outside your area of emphasis

*Members of the examination committee, other than your major advisor, cannot also serve on your dissertation committee.

A list of all Computing Faculty can be found on the program website at http://computing.boisestate.edu/emphasis-area-faculty/

Synthesis Paper
The synthesis paper should show critical thinking about the reviewed papers and propose several possible research questions. Your advisor, with input from your exam committee, will provide a set of at least 4 scientific papers. You should use these papers as a starting point and perform a literature search to better cover the breadth of existing related work.

You may receive feedback from your major advisor prior to formal submission of the written comprehensive examination. However, the literature review should be your own work. You will be asked to sign an affirmation that confirms that the work is your own and does not reflect an act of plagiarism. The affirmation form can be found on the program website at http://computing.boisestate.edu/academic-forms/
**Computing artifact**  
The computing artifact element of the comprehensive exam can be a separate project or an extended class project. The artifact will contain program(s) and output that must be well tested and documented. Your examination committee should determine the minimum requirements for the artifact and notify you of these evaluation criteria within one month of accepting to serve on the committee.

**Oral Presentation**  
The Oral Presentation should be scheduled for two weeks after you submit your synthesis paper and computing artifact for review by your committee. If your full committee is not available within two weeks, schedule for the next earliest date.

*It is your responsibility to schedule the presentation date with your committee members and reserve a room.*

You should print a copy of the Comprehensive Exam Approval Form and take it with you. The form can be found on the program website at http://computing.boisestate.edu/academic-forms/

**Oral Presentation Format**  
The format of the oral examination consists of a 30 minute public presentation of your synthesis paper and computing artifact, including a public question and answer session.

The public question and answer session will be followed by a closed-door period of questioning by the examination committee based on content in the synthesis paper and computing artifact. Only the committee members may attend the closed-door session.

After the examination, you will be asked to leave, and your committee will discuss and vote on your performance on the synthesis paper, computing artifact, and oral presentation.

Your committee will complete the Comprehensive Exam Approval Form and present it to you for review and your signature. Please return the completed form to the Program Coordinator.
Failure of the Comprehensive Exam

Per the graduate student catalog, students that fail their first attempt at any element of the comprehensive exam may be granted a second attempt of that element. Students who fail any portion of the comprehensive exam must submit the Report of Failure of Comprehensive Examination form - found on the Graduate College website: https://graduatecollege.boisestate.edu/forms/ within 5 days.

If retaking any portion of the exam students must submit the Request to Retake the Comprehensive Exam form, found on the program website http://computing.boisestate.edu/academic-forms/ within 5 days.

Requests to retake the comprehensive exam must be submitted in writing to the PhD in Computing steering committee and must be made within 5 working days after the student is notified of his or her failure of the exam.

If the request to retake is approved students have one semester, not including summer, after receiving notice of failure to submit the retaken elements of the exam.

If a second attempt is not submitted before the end of the semester, or if the second attempt is failed, a grade of (F) is assigned to COMPUT 691, and the student will be dismissed from the university by the Graduate College. Any extension of the two-month limit on the second attempt must be approved by the Program Directors and by the Dean of the Graduate College.