

# PhD Qualifying Exam Process

Last Updated: Sep 18, 2024

## Purpose:

- The purpose of the Qualifying Exam is to test the student's basic preparation in research and in topic areas that are considered core to computer science and engineering.

## Qualifying Exam **Eligibility:**

- Must have taken or be enrolled in the following courses at UNL at the 400 as an undergraduate or 800 level as a graduate student and receive at least a B+ in both courses 1 and 2 or have received a waiver from the Graduate Committee (see Waivers section and FAQ for options).
  - For CS:
    - 1) CSCE 823: Design and Analysis of Algorithms  
OR CSCE 828 Automata, Computation, and Formal Languages
    - 2) CSCE 830: Computer Architecture  
OR CSCE 851: Operating Systems Principles  
OR CSCE 862: Communication Networks
  - For CE:
    - 1) CSCE 830: Computer Architecture  
OR CSCE 851: Operating Systems Principles
    - 2) CSCE 862: Communication Networks  
OR CSCE 836: Advanced Embedded Systems
  - For Bioinformatics:
    - 1) CSCE 823: Design and Analysis of Algorithms  
OR CSCE 828 Automata, Computation, and Formal Languages
    - 2) BIOS 820: Molecular Genetics  
OR BIOC 831 Biochemistry  
OR CSCE 871: Introduction to Bioinformatics
  - For Joint CS/Math: Must have taken or be enrolled in one of the four following courses at UNL at the 400 as an undergraduate or 800 level as a graduate student and receive at least a B+ in it or have received a waiver from the Graduate Committee (see Waivers section and FAQ for options). The courses are (1) CSCE 823: Design and Analysis of Algorithms (2) CSCE 828: Automata, Computation, and Formal Languages (3) CSCE 830: Computer Architecture (4) CSCE 851: Operating Systems.
- Be enrolled in or have taken CSCE 991: Directed Doctoral Research
- Register to take the exam by the **Qualifying Exam Registration deadline**.
- Submit a topic and abstract to the committee by the **Qualifying Exam Abstract Submission deadline** (max 1 page). Approval by the committee is required.

## Qualifying Exam **Format:**

- Student writes and prepares a 6-8 page paper (IEEE or ACM conference format, excluding references). It is expected that this paper is developed as part of CSCE 991 with the guidance of their advisor (However, see waivers section and FAQ for options). The research for this paper must be primarily completed by the student. It must be submitted by the deadline to be eligible to present to the committee. The paper can be based on:

- A literature survey of the intended area of research; OR A research paper that was developed and written by the student.
- 60 Minute closed oral exam with examination committee:
  - 20-30 minute student presentation on their paper.
  - Questions from the committee, focused on the presentation and paper.
  - Followed by private discussion and pass/fail vote by the committee.
  - The majority vote will determine the outcome of the exam. The vote and summary of discussion and/or recommendations of the committee are given to the graduate committee to make the final decision. The recommendations can include possible conditions for passing the exam.
  - Oral exams will be videotaped for review only in the case of appeals. Students can request that the exam not be videotaped.
- See the Waivers section for additional waivers that may apply.

**Qualifying Exam Number of Attempts:**

- A student admitted to the Computer Science and Engineering Ph.D. programs with an MS received at the university or elsewhere must fulfill his/her Qualifying Examination requirement no later than the third semester after admission. A student admitted to the Computer Science and Engineering Ph.D. program without an MS must fulfill his/her Qualifying Examination requirement no later than the fourth semester after entrance. A student may take the exam no more than twice.

**Suggested Timeline** during Fall and Spring Semesters (to be adjusted by the committee):

- Prior to Week 2: Submit the topic and abstract. It is recommended that the student submit the topic and abstract towards the beginning of their enrollment in CSCE 991, well in advance of registering for the qualifying exam. The topic will generally be approved by the committee within 2-4 weeks. Substantial changes to the topic require a resubmission. Course waivers should also be submitted to the graduate committee chair at this time or earlier and will be generally reviewed by the committee within 2-4 weeks.
- Week 2: Registration deadline
- Week 7-8: Submission of report
- Rest of semester: Oral exams, decisions, and appeals based on committee availability

**Qualifying Exam Committee (QEC) Composition:**

- Must have CSE Graduate Faculty status.
- Appointed by the department chair in consultation with the Graduate Chair for a recommended 3 year term. The QEC is overseen by and reports to the Graduate Committee.
- For a given student a QEC sub-committee is assigned by the Graduate Chair consisting of three members, where:
  - The committee cannot include the advisor or co-advisor.
  - The Graduate Chair appoints a QEC sub-committee chair. The QEC sub-committee chair will run the qualifying exam for that student, including review of prior work for similarities and academic integrity, and will provide a written report containing the vote of the QEC sub-committee on both the written paper and oral exam and summary of discussion and/or recommendations to the graduate committee. The majority vote will determine the outcome of the exam.

- The QEC committee should include at least 4 members to avoid scheduling and advising conflicts. If necessary, additional temporary members can be appointed.

#### Qualifying Exam **Waivers**:

- Parts of the Qualifying Exam may be waived under the following circumstances. Even if you receive a waiver, you must submit the qualifying exam registration form.
- Students who completed an MS thesis in the CSE department at UNL will receive an automatic waiver from the **paper and oral** portions of the exam. The grade requirements for courses 1 and 2 are not waived.
- Students with a published paper and an MS thesis from another institution may request a waiver from the Graduate Committee for the **paper** portion of the exam. *Note that the student should be the primary contributor to the original paper.* If a waiver is granted, the student must still do the oral portion of the exam based on the prior paper. The grade requirements for courses 1 and 2 are not waived.
- Students with a grade of A or better in courses 1 and 2, a cumulative graduate GPA of no less than 3.8, and who has published or has an accepted a paper in a strong venue as the lead contributor can be exempted from the **paper and oral** portions of the exam upon approval by the Graduate Committee. *Note that the student should be the primary contributor to the original paper.*

#### Qualifying Exam **Appeals**:

- Appeals will follow the current appeal process administered by the graduate committee.

#### **Transitioning** from the existing process:

- All students enrolled prior to and including the Fall 2018 semester will have the option to take either the old written qualifying exam or follow this new format.
  - Students who are taking a qualifying exam for the first time will have two chances to take an exam (in any format) within the required timeline. As long as the old written format is available as an alternative to the new oral format, the students can choose to take the old format or the new format in any of the attempts.
  - Students who have previously taken the old written qualifying exam may choose to take their subsequent exam in this format, but will have to pass a qualifying exam within the required timeline and number of attempts.

## FAQ

- What if I already took one of the required courses at my prior institution?
  - *You can submit an appeal to the graduate committee chair to obtain a waiver for the course. This requires an evaluation of course materials and grade. In some cases the committee may recommend that you take the final exam in the course to demonstrate your knowledge of the area.*
- What if I did not achieve the minimum grade needed to be eligible for the qualifying exam?
  - *You can retake courses to obtain the minimum grade. It is also possible to appeal to the graduate committee to obtain a waiver if there are special circumstances.*
- Can I take the exam before I take one of the required courses?
  - *You must have taken or be enrolled in the courses before taking the exam. If you are enrolled in, but have not completed, a required course then any pass will be conditional on obtaining at least the minimum required grade.*
- What happens if I do not pass the exam?
  - *You can take the exam twice and appeals are possible. The deadline for passing the exam is 3 semesters for students with an MS and 4 semesters for students starting the PhD program without an MS. Sometimes the committee will recommend a conditional pass where additional courses, revisions, or presentations are required before fully passing.*
- What if I do not want to have my oral exam videotaped?
  - *If you do not want to have your oral exam videotaped, please indicate this on the exam registration form. Note that the videotape, if available, is used as one part of the student appeal process.*
- Can I submit a research paper that is co-authored?
  - *If the research paper is based on a co-authored piece, then the paper should be rewritten or significantly extended and the original paper should be included as an appendix. Regardless, the student should be the primary contributor to the original paper.*
- Can I submit a research paper on the same topic as the research I plan to do for my PhD?
  - *Yes, we encourage you to base your research paper or literature survey on the work you are doing in CSCE 991, which often leads directly into your PhD research.*
- Can I submit a research paper based on work I did for my MS or another course project?
  - *It depends and this should be explicitly disclosed to the committee when submitting your topic to obtain approval. You should also discuss your options with your adviser and in CSCE 991. As an example, if you recently completed an MS, then it may be appropriate to revise and condense your MS thesis into a concise research paper. Or if you already have written a conference or journal paper on your MS work, then it may be appropriate to submit this paper with minor modifications. On the other hand, a paper from a group course project may not be sufficient without significant changes and additions.*

- How much can I discuss and/or work on my research paper/literature survey with my adviser?
  - *Your research paper can certainly be discussed and developed in consultation with your adviser and as part of CSCE 991 since obtaining feedback is part of the research process. However, the paper should be primarily developed and written by you and you must follow the CSE Academic Integrity Policy.*
- What are reasonable topics for my research paper or literature survey?
  - *Typically, topics are developed in consultation with your adviser and as part of CSCE 991 and then are approved by the committee prior to taking the exam. Topics should be based on or build on current research topics in your field of study. Literature survey should clearly state research questions, review related work, and present the motivation, progress, and contribution of your (proposed) work.*