Program Orientation for PhD in CS

Program Requirements

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Program Information

• Program Overview
• **Degree Requirements**
• Registration
• Financial Support
• Ethics and Research Responsibility
Requirements

Fall 2020 Handbook describes your PhD progress and graduation requirements.

• This is your default set of requirements.
  • At the time of graduation, you may choose a the requirements from a more recent edition of the Handbook (if anything has changed).
  • You cannot mix and match requirements from different years.
  • Generally there may be minor tweaks form year to year, but major changes are infrequent.
PhD Program Structure

• Graduate-Level Courses
  • Timing: mainly in the first 2 years

• Research under supervision of a faculty advisor
  • Timing: throughout the program, but starting at least at the end of the 2nd semester
  • Begin with critical reading of a research problem
  • Develop into independent and original research

• Teaching (TA responsibilities),
  • Timing: mainly in the first year
Steps and Milestones

1. **Qualifier Courses**
   - Time limit: By the end of 4 semesters
   - *Strong recommendation: Complete in 3 semesters*

2. **Research Proficiency Exam**
   - Time Limit: By the end of 4 semesters
   - Earlier completion for research-ready students

3. **Preliminary Thesis Proposal**
   - Complete by end of year 4

4. **Thesis Defense**
   - Complete by end of year 5
Remember Your Goal

*Do scholarly research to complete your PhD Degree*

- Focusing only on how to complete Qualifiers as quickly and easily as possible is not recommended.
- Focusing on research to the detriment of coursework is not recommended either.
- In your first year, you should select courses judiciously so that they:
  - Help you complete Qualifier requirements
  - Give you background in your expected area of research
  - Help you identify and begin work with a research advisor
- Shortcuts don’t help!
1. Qualifiers

Complete 5 Graduate Courses with grade A- or better, with following restrictions:

• At least 4 courses, covering at least 3 breadth areas:
  • Theory, Software, Systems, IIS.
• The 5\textsuperscript{th} course may be any non-generic graduate lecture course, i.e.:
  • Any CSE 5xx except 500, 522, 523, 524, \textbf{550}, 587, 590—599
  • Any course in set CSE 601-638.

\textbf{Required}: Complete in 4 semesters.

\textbf{Recommended}: Complete in 3 semesters; research-ready students who finish their RPE early may take 4 semesters.
Sample Plan for First 2 Years

1\textsuperscript{st} semester: 2+ quals completed, narrow down dissertation advisor

2\textsuperscript{nd} semester: 2+ additional quals completed, have dissertation advisor

1\textsuperscript{st} summer: research with dissertation advisor

(\textbf{IMPORTANT:} Don’t disappear in summer!)

3\textsuperscript{rd} semester: finish any remaining quals, research with advisor

4\textsuperscript{th} semester: take any other course you want/need, research with advisor

2\textsuperscript{nd} summer: complete research for RPE, finish RPE by end.

\textit{Many (most?) students finish quals requirements in 1\textsuperscript{st} year.}
Theory Qualifiers

- CSE 512: Machine Learning
- CSE 540: Theory of Computation
- CSE 541: Logic in Computer Science
- CSE 547: Discrete Mathematics
- CSE 548: Analysis of Algorithms
- CSE 549: Computational Biology
Software Qualifiers

- CSE 504: Compiler Design
- CSE 505: Computing with Logic
- CSE 526: Principles Programming Languages
- CSE 532: Theory of Database Systems
- CSE 535: Distributed Systems
Systems Qualifiers

• CSE 502: Computer Architecture
• CSE 506: Operating Systems
• CSE 508: Network Security
• CSE 509: Computer System Security
• CSE 534: Fundamentals of Computer Networks
IIS Qualifiers

- CSE 519: Data Science Fundamentals
- CSE 527: Introduction to Computer Vision
- CSE 528: Computer Graphics
- CSE 537: Artificial Intelligence
- CSE 538: Natural Language Processing
- CSE 564: Visualization

[IIS = Information and Intelligent Systems]
2. RPE

Research Proficiency Exam

*Designed to test basic ability to critically read papers, synthesize information, understand problems, and formalize arguments.*

- When working with an advisor, acquire significant familiarity with one research problem area
- Survey important papers in a narrow area; synthesize info. on their contribution
- Write a formal RPE report
- Make an hour-long presentation before an RPE committee (open to all)
- Required completion: by the end of Year 2.
3. Prelim

_Thesis proposal_

• Formerly, this was a formal exam with a pass/retake/fail (hence sometimes called by its old name “Prelim Exam”)

• Now this is a proposal of your thesis to a faculty committee

• Generally done when the thesis problem is clear

• The proposal is a detailed report on what has been done so far, and
  • lists what will be completed before the thesis is finished.

• There is a formal proposal presentation to the committee (others may attend by invitation)
4. Defense

• Complete and submit dissertation to a committee (with one external member)

• Make a formal presentation to the committee (open to all)

• Upon successful completion, celebrate (and answer countless questions on where you are headed next).
Good Standing

- Academic progress is evaluated by entire faculty
  - PhD Review meetings held twice a year
  - Progress in qualifier and other courses, GPA
  - Advisor report on research progress
  - Student’s self-report on research progress
  - TA evaluations (by supervising faculty)
    - Poor performance may lead to immediate loss of good standing

- Graduate School criteria (common to all graduate programs):
  - GPA >= 3.0

- Loss of good standing may lead to:
  - Loss of financial support, tuition scholarship
  - Dismissal from program
Graduate Credits

PhD students must accumulate at least 20 credits from non-generic CS graduate courses.

• Credits for generic courses such as CSE 593, 600, 698, 699 do not count.

• All lecture courses, special and advanced topic courses and seminars (except CSE 600) are included in this count.

• Note that qualifier courses alone contribute at least 15 credits.
CSE 600

Mandatory seminar: “Ongoing Research Seminar”

• Generally, Fridays 2:30-4:00

• Faculty present their current research
  • Occasionally we have visitors as well

• Gives you a broad overview of current research in CS

• All PhD students must enroll in 2 semesters of CSE 600
  • You can register for 0/1 credit
  • The requirement is 2 semesters of enrollment; not 2 credits.

• S/U grading based on attendance (>70%)
CSE 698

Teaching Practicum

• Claim credit for your TA work

• All PhD students must enroll in at least 1 semester of CSE 698

• 0-3 credits of registration in any semester
  • Again: requirement is enrollment in 1 semester, not number of credits.
MS on the way

• PhD students can get an MS while continuing their doctoral studies

• Students may opt for MS on the way, a year after advancing to candidacy
  • Needs approval of the dissertation advisor

• Research credits and RPE will be used in lieu of MS thesis (up to 9 credits)

• Otherwise, must meet all MS requirements.
  • Note: PhD students cannot register for “MS-Only Courses”: CSE 522, 523, 524, 596, 597, or 599.
Other Program Information

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