

From: [Carpenter, TJ](#)
To: [Reed, Katie](#)
Cc: [Quinzon-Bonello, Rosario](#); [Mirti, Maria](#)
Subject: FW: CSE Program Change Proposal
Date: Friday, March 24, 2023 2:24:24 PM
Attachments: [CSE Qual Exam Revision Spring 2023 to GS-CAA.pdf](#)
[image001.png](#)
[image002.png](#)

Katie,

Good afternoon! Please find an informational item attached from Engineering to revise the qualifying exam in the Computer Science program. Dean Mirti has reviewed the informational item and had no immediate concerns.

Please feel free to share with Randy and let us know if you have any questions.

Thanks!



TJ Carpenter, MS

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Pronouns: He/Him/His

From: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>

Sent: Tuesday, March 7, 2023 5:13 PM

To: Carpenter, TJ <carpenter.1112@osu.edu>

Subject: CSE Program Change Proposal

Hello TJ –

I am not sure if the attached would be considered an informational item. It seems pretty straight forward.

Thanks!

Rosie



Rosario (Rosie) Quinzon-Bonello, M.Ed.

Assistant Dean for Curriculum and Assessment

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Memo

To: Maria Miriti, Interim Associate Dean, Graduate School
From: Rosie Quinzon-Bonello, Assistant Dean for Curriculum and Assessment
Date: March 7, 2023

Re: Department of Computer Science and Engineering revisions to Ph.D. Program

On March 3, 2023, the College of Engineering Committee for Academic Affairs voted unanimously to approve the Department of Computer Science and Engineering's proposal to

- revise the PhD Major/Minor requirements
- update the PhD candidacy and qualifying course requirement, which was approved by CAA on September 7, 2022.

If you require additional information, feel free to contact me.

Yours sincerely,

Rosie Quinzon-Bonello

Graduate Studies Committee
Department of Computer Science and Engineering
The Ohio State University
Address: 395 Drees Lab, 2015 Neil Ave
Columbus, OH 43210, USA



THE OHIO STATE UNIVERSITY

To: College of Engineering Curriculum Committee
Cc: Dr. Panton Boyd (CoE Curriculum Committee Chair)
Ms. Rosario Quinzon-Bonello (CoE Assistant Dean for Curriculum and Assessment)

Re: Updates to the PhD Candidacy and Qualifying course requirement at the Department of Computer Science and Engineering

December 12, 2022

Dear College of Engineering Curriculum Committee,

The Department of Computer Science and Engineering is filing an informational letter about three changes to the PhD Candidacy Major/Minor course requirement and the PhD Qualifying Process course requirement, which were approved by the entire CSE faculty in December 2022. These changes are to address minor discrepancy issues in the new PhD Qualifying Process (effective since Autumn 2022) and the PhD Candidacy Major/Minor course requirement.

Attached please find the two updated documents (Attached as Exhibit A & Exhibit B) with the changes highlighted. For your convenience, I summarize the changes as follows.

1. **[Exhibit A: PhD Qualifying Process]:** Adding CSE 5472 into the course list of Security and Privacy.
2. **[Exhibit B: PhD Candidacy major/minor]:** Expanding existing major/minor areas with “Security and Privacy”.
3. **[Exhibit A & B: PhD Qualifying Process and PhD Candidacy major/minor]:** Allowing one course being double counted towards the PhD Qualifying Process and the PhD Candidacy major/minor courses.



THE OHIO STATE UNIVERSITY

Thank you for reviewing the update! Should you have any questions, please feel free to contact me at qin.34@osu.edu.

Sincerely,

Feng Qin
Associate Professor
Chair of the Graduate Studies Committee
Department of Computer Science and Engineering
The Ohio State University

The Ph.D. Qualification Process in CSE

- The original version was approved by Graduate Studies Committee on 04/25/2022 and by the entire Faculty group on 04/28/2022
- The revision 1 was approved by Graduate Studies Committee on 10/21/2022 and by the entire Faculty group on 10/31/2022

Overall Requirements

The CSE Ph.D. Qualifying Process consists of two components: one is coursework, and the other is research. To pass the Qualifying Process, a student needs to demonstrate satisfactory performance on both components: (1) Be competent and knowledgeable on fundamental principles of computer science and engineering, and (2) show promise for conducting original research in the areas of computer science and engineering.

For the coursework component, a student needs to achieve the average GPA of 3.3 or above on four CSE courses that include a required Algorithms course (CSE 6331) and three other courses chosen by the student in consultation with the faculty advisor ^[1]. The three courses can be chosen from the seven categories listed below with at most one course from a single category. **Note that a student may count one Qualifying course in this new Qualifying Process towards the major/minor course requirements in the Candidacy Exam.** For the research component, a student is required to work with their faculty advisor and demonstrate satisfactory research progress ^[2].

Course Categories

The seven categories of CSE courses include:

- (1) Artificial Intelligence and Data Mining (CSE 6521, CSE 5523, CSE 5526, CSE 5243, CSE 5245)
- (2) Graphics and Visualization (CSE 5542, CSE 5543, CSE 5544, CSE 5545, CSE 5546)
- (3) Computer Networking (CSE 5462, CSE 5463)
- (4) Security and Privacy (CSE 5471, **CSE 5472**, CSE 5473, CSE 5474)
- (5) Computer Systems (CSE 6431, CSE 6421, CSE 6333, CSE 5242, CSE 5441)
- (6) Software Engineering and Programming Languages (CSE 6341, CSE 5343)
- (7) Computer Theory (CSE 6321, CSE 6332, CSE 5351)

Procedures and Timeline

A Qualifying Process has two checkpoints: the first is by the end of Year 1 ^[2] and the second is by the end of Year 2^[2]. In the first checkpoint, a student reports the grades of the Qualifying courses that have been taken. The student will comment on their progress towards identifying a research advisor and making research progress.

Early in the program, a student should identify research advisor(s) for the Ph.D. study. This may be the same as the initial academic advisor assigned by the Department, or a different faculty member. The research advisor must be a member of the graduate faculty with "P" advising status in CSE. A student should declare the research advisor, *even if she or he is the same as the initial academic advisor*, by filing a "Change of Advisor Form" available in 395 Dreese. The research advisor will provide academic and research advice once the change of advisor form is submitted.

In the second checkpoint, a student reports the grades of the Qualifying courses that have been taken. The student's faculty advisor will be contacted subsequently to provide input on the student's research progress. Based on the student's course work performance and the advisor's research assessment, the Grad Studies Committee will notify the student of the Qualifying Process result at the second checkpoint. Both checkpoint forms can be found at [the CSE Portal](#).

If a student does not achieve the GPA requirement with the first four courses, a student may (a) retake the same course (required for Algorithms), (b) take a different course in the same course category, or (c) take a course in another course category. This should be done in consultation with the faculty advisor. Students may file the second checkpoint form once they have achieved satisfactory performance on both coursework and research components, which could be earlier than the end of Year 2. Students should consult with their research advisor before submitting the second checkpoint form.

To maintain the status of "Good Standing" in CSE^[3], a Ph.D. student is expected to pass the Qualifying Process by the end of Year 2. Otherwise, a student who is not in good standing will not have a guaranteed appointment as a graduate teaching associate. A student who continues to not return to good standing in a timely way (e.g., by the end of the third year) may be dismissed from the Ph.D. program in Computer Science and Engineering after a conversation among the student, advisor, and graduate studies committee.

Implementation

This new Ph.D. Qualifying Process will be effective starting from Autumn 2022. Specifically, a student who is enrolled in the Ph.D. program of CSE in Autumn 2022 or after can only take this new Ph.D. Qualifying Process. For a smooth transition, a student who was enrolled prior to Autumn 2022 may choose to take this new Qualifying Process or the old Qualifying Exam.

Definitions and Criteria

1. *Faculty advisor*: A student's initial academic advisor assigned by the Department, or the research advisor chosen by the student.
2. *The criteria of satisfactory research performance*: The most common way of satisfying this requirement is for the student to be a leading or significant contributor on a paper published, accepted, submitted, or in preparation to submit to a venue in Computer Science. Faculty advisors may provide evidence that the student has satisfied this requirement in other ways, such as making a significant contribution in research artifacts such as released software packages.
3. *The end of Year x*: Two weeks after the end of 2*x non-summer terms since a student's initial enrollment in the Ph.D. program of Computer Science and Engineering at Ohio State University.
4. *Good Standing in CSE*: In addition to [the requirements from the Grad School](#), a Ph.D. student in CSE is required to pass the Qualifying Process by the end of Year 2. Students must also demonstrate English proficiency through one of the approved mechanisms listed on [the "English as a Second Language" website](#) by the end of Year 1.

Additional Notes

1. While there is no accelerated option in the new policy of the PhD Qualifying Process, the accelerated option is still applicable to a student who was enrolled prior to Autumn 2022 if the student chooses to take the Qualifying Exam in the old policy.

2. A student cannot transfer the credits of a Qualifying course from their prior institutes. If a student took a Qualifying course in the undergraduate program at Ohio State, the course can be counted towards the requirement of the Qualifying Process. However, the course credits cannot be counted towards their Ph.D. degree requirement except for the situations (such as the BS/MS program) allowed by the Graduate School.

[The following is internal to faculty]

Research Components

After a student fills the form for the second checkpoint, the CES Portal will automatically send a notification to the faculty advisor. The advisor answers the question, which is whether the student has made satisfactory performance on conducting original research*. Optionally, the advisor may provide more detailed comments about the student's research in the comment box.

* *The criteria of satisfactory research performance*: The most common way of satisfying this requirement is for the student to be a leading or significant contributor on a paper published, accepted, or submitted, or in preparation to submit to a venue in Computer Science. Faculty advisors may provide evidence that the student has satisfied this requirement in other ways, such as making a significant contribution in research artifacts such as released software packages.

The Ph.D. Qualifying Process Form

Section I: Student Info [Filled by student]

First Name: _____ Last Name: _____ OSU ID: _____

Initial Enrollment Term: (Auto populate)

Your designated faculty advisor*: (Auto populate)

*....

Section II: Course Info [Filled by student]

The required course: CSE 6331, Grade: (Auto populate), Term: (Auto populate)

Three chosen courses:

(1) Category: [select <- 7 options], Course: [select <- courses], Grade: (Auto populate), Term (Auto populate)

(2) Category: [select <- 7 options], Course: [select <- courses], Grade: (Auto populate), Term (Auto populate)

(3) Category: [select <- 7 options], Course: [select <- courses], Grade: (Auto populate), Term (Auto populate)

What efforts have you made to identify a research advisor and make research progress?

[textbox]

Section III: Research Info [Filled by faculty advisor]

1. The student has worked with me on research project(s) and has demonstrated satisfactory progress of conducting original research*. Note this question should be answered by the end of Year 2 since the student's initial enrollment in the Ph.D. program at CSE.

Yes [] No []

2. [Optional comments] You may provide additional comments here about the student's research or other relevant topics.

* *The criteria of satisfactory research performance:* The most common way of satisfying this requirement is for the student to be a leading or significant contributor on a paper published, accepted, or submitted, or in preparation to submit to a venue in Computer Science. Faculty advisors may provide evidence that the student has satisfied this requirement in other ways, such as making a significant contribution in research artifacts such as released software packages.

---- end of the form ----

[Internal notes on the implementation of the first and second checkpoint forms]

Once a student fills the name or OSU id, the system will automatically populate the initial enrollment and the designated faculty advisor. Once a student selects a category and the course number, the system will automatically populate the course grade and the term. Also, the faculty advisor designated in the system will also be populated automatically. The textbox is for a student to answer the question about identifying research advisors.

The system will send a notification to the faculty advisor to solicitate inputs on the student research progress. If the advisor chooses Yes for the Question, the student passes the Qualifying Process. In this case, a message will be automatically generated to inform the student, the advisor, the Grad Studies Coordinator, and the Grad Studies Chair of the passing result.

A warning message will be sent to the advisor, the Grad Studies Coordinator, and the Grad Studies Chair if any of the following situations occurs: (1) the average GPA of the Qualifying courses is below 3.3, (2) The textbox Section II (for students to fill about identifying research advisors) is empty, and (3) "No" is chosen for Question#2 in Section III for a student at the end of Year 2 or later.

CSE PhD MAJOR/MINOR REQUIREMENTS

General Requirements

- (1) 10 letter graded credits are required for the major
- (2) 6 credits (at least 5 letter-graded) are required for each of the 2 minors
- (3) A student may apply one course that is counted towards the new qualification process (effective since Autumn 2022) for the major/minor requirement. However, core courses that are counted in the old qualification exam (effective before Autumn 2022) *cannot* be counted as major or minors.

Additional Notes

- (1) Students can take major and minors outside of the list below. They should contact a faculty member in that area prior to taking any of the classes.
- (2) Input from High-End Computing and Networking areas was not received in time for this update. However, students can still continue to major and minor in these areas - please see above.
- (3) Students could meet the requirements for the major/minors listed below using an alternative set of classes, including possibly graduate classes taken at another institution. They should contact their major/minor advisor to discuss this in ADVANCE.

TOPIC AREAS

Software Engineering and Programming Languages

Major course requirements (10 credit hours)

Required:

- a. 6341 - Foundations of Programming Languages
 - (1) Can be counted only if 6321 was used for qualification process

Electives: Choose from the following

- a. 5234 - Distributed Enterprise Computing
- b. 5235 - Applied Enterprise Architectures and Services
- c. 5236 - Mobile Software Development
- d. 5239/5349 - taught by SE&PL faculty subject to the following constraints:
 - (1) At least 3 credit-hours from courses other than 5239/5349
 - (2) At least 2 credit-hours from 5239/5349
- e. 5343 - Compiler Design and Implementation
- f. 6321 - Computability and Complexity
 - (1) Can be counted only if 6341 was used for qualification process
- g. 6333 - Distributed Algorithms

Minor course requirements (6 credit hours) Required:

- a. 6341 - Foundations of Programming Languages
 - (1) Can be counted only if 6321 was used for qualification process

Electives: Choose from the following

- a. 5234 - Distributed Enterprise Computing
- b. 5235 - Applied Enterprise Architectures and Services
- c. 5236 - Mobile Software Development

- d. 5239/5349 - Intermediate Studies in taught by SE&PL faculty
- e. 5343 - Compiler Design and Implementation
- f. 6321 -Computability and Complexity
 - (1) Can be counted only if 6341 was used for qualification process
- g. 6333 - Distributed Algorithms

Graphics

Major course requirements (10 credit hours)

Required:

- a. 5542 - Real-time Rendering
- b. 5543 - Geometric Modeling
- c. 5545 - Advanced Computer Graphics

Electives: Choose from the following

- a. 5544 - Introduction to Data Visualization
- b. 5559 - Intermediate Studies in Computer Graphics
- c. 5912 - Game Design Capstone
- d. 5913 - Computer Animation Capstone

Minor course requirements (6 credit hours)

Required:

- a. 5542 - Real-time Rendering

Electives: Choose from the following

- a. 5541 - Computer Game and Animation Techniques
- b. 5543 - Geometric Modeling
- c. 5544 - Introduction to Data Visualization
- d. 5559 - Intermediate Studies in Computer Graphics
- e. 5912 - Game Design Capstone
- f. 5913 - Computer Animation Capstone

Theory and Algorithms

Group 1:

CSE 6321 - Computability and Complexity (if not used for the qualification process)

CSE 6332 - Advanced Algorithms

CSE 6333 - Intro to Distributed Computing

CSE 5543 - Geometric Modelling

CSE 5351 - Introduction to Cryptography

CSE 5539 - Computational Geometry/Randomized algorithms and other courses offered by theory faculty

Group 2:

Math 4547, 4548 (547, 548, 549) Analysis

Math 4575 (575) Combinatorial Mathematics and Graph Theory

Math 4578 (578) Discrete Mathematical Models

Math 5051 (648, 649) Mathematical Logic

Math 5801 (655, 656, 657) Topology

Math (674) Survey of Combinatorial Mathematics
Math 6501, 6502 (775, 776, 777) Combinatorics and Graph Theory
Math 6607, 6602 (707, 708, 709) Numerical Methods in Scientific Computing
Math 6251, 6252 (722, 723, 724) Probability
ISE (702) Mathematical Programming: Linear
ISE 5200 (720) Linear Optimization
Stat 6201 (520, 521) Mathematical Statistics

Major course requirements (10 credit hours)

At least 2 courses from group 1, one of which must not be numbered 5xy9.

Minor course requirements (6 credit hours)

At least one course from group 1, not numbered 5xy9.

Software Systems

Major course requirements (10 credit hours)

Required:

- a. One of:
 - (1) 5242 – Advanced Database Management System
 - (2) 5243 - Introduction to Data Mining
- b. One of:
 - (1) 6333 – Distributed Algorithms
 - (2) 6431 – Advanced Operating Systems (if not used for the qualifying process)

Electives: Choose from the following

- a. 5241 - Introduction to Database Systems
- b. 5243 - Introduction to Data Mining
- c. 5245 - Introduction to Network Science
- d. 5249 - Intermediate Studies in Databases
- e. 5343 - Compiler Design and Implementation
- f. 5433 - Operating Systems Laboratory
- g. 5439 - Intermediate Studies in Operating Systems
- h. 5449 - Intermediate Studies in Parallel Computing
- i. 5915 - Capstone Design: Information Systems
- j. 6431 – Advanced Operating Systems (if not used for qualification process)

Minor course requirements (6 credit hours)

DATABASE Track →

Required: One or both of:

- a. 5242 - Advanced Database Management System
- b. 5243 - Introduction to Data Mining

Electives: Choose from the following

- a. 5241 - Introduction to Database Systems
- b. 5245 - Introduction to Network Science
- c. 5249 - Intermediate Studies in Databases
- d. 5915 - Capstone Design: Information Systems
- e. 6249 - Advanced Studies in Databases

DISTRIBUTED COMPUTING Track →

Required: None

Electives: Choose from the following

- a. 6333 - Distributed Algorithms
- b. 6431 - Advanced Operating Systems (if not used for qualification process)
- c. 5433 - Operating Systems Laboratory
- d. 5439 - Intermediate Studies in Operating Systems
- e. 5449 - Intermediate Studies in Parallel Computing
- f. 6439 - Advanced Studies in Operating Systems
- g. 6449 - Advanced Studies in Parallel Computing

Artificial Intelligence:

Major course requirements (10 credit hours)

Required:

- a. One of:
 - (1) 5522 - Survey of Artificial Intelligence II: Advanced Techniques
 - (2) 6521 – Artificial Intelligence
- b. One of:
 - (1) 5523 - Machine Learning and Statistical Pattern Recognition
 - (2) 5526 - Introduction to Neural Networks

Electives: Choose from the following

- a. 5524 - Computer Vision for Human-Computer Interaction
- b. 5525 - Foundations of Speech and Language Processing
- c. Including up to one 5539 - Intermediate Studies in Artificial Intelligence

Minor course requirements (6 credit hours)

Required:

- a. One of:
 - (1) 5521 - Survey of Artificial Intelligence I: Basic Techniques
 - (2) 5522 - Survey of Artificial Intelligence II: Advanced Techniques
 - (3) 6521 – Artificial Intelligence

Electives: Choose from any other graded AI courses including up to one 5539

Security and Privacy

Major course requirements (10 credit hours)

Required:

- a. 5471 Introduction to Cybersecurity
- b. One of:
 - (1) 5473 – Network Security
 - (2) 5474 – Software Security

Electives: Choose from the following

- a. 5351 – Introduction to Cryptography
- b. 5359 – Intermediate Studies in Cryptography
- c. 5472 – Information Security Projects
- d. 5477.01 – Offensive Security
- e. 5477.02 – Malware Analysis and Reverse Engineering
- f. 5479 – Intermediate Studies in Computer Security
- g. 5194.01 – Digital Forensics

Minor course requirements (6 credit hours)

Required:

- a. None

Electives: Choose from the following

- a. 5351 – Introduction to Cryptography
- b. 5359 – Intermediate Studies in Cryptography
- c. 5471 – Introduction to Cybersecurity
- d. 5473 – Network Security
- e. 5474 – Software Security
- f. 5477.01– Offensive Security
- g. 5477.02– Malware Analysis and Reverse Engineering
- h. 5472—Information Security Projects
- i. 5194.01 – Digital Forensics