FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Graduate Programs

UGPC Approval _____
UFS Approval _____
Banner _____
Catalog _____

Department Electrical Engineering and Computer Science

College Engineering and Computer Science

Program Name

PhD Computer Science; PhD Computer Engineering; PhD Electrical Engineering

☐ **New Program***

☑ **Change Program***

Effective Date
(TERM & YEAR)

Summer 2024

Please explain the requested change(s) and offer rationale below or on an attachment.

EECS department is revising the Candidacy Examination for the PhD programs. The exam is changing from a course-based exam to a new format which is more suitable to asses students' readiness to conduct research at the doctoral level. For the new exam, a student will read and comprehend a research paper, prepare a PPT presentation, followed by oral presentation and examination.

*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.

Faculty Contact/Email/Phone

Hari Kalva/hkalva@fau.edu/561-297-0511

Consult and list departments that may be affected by the change(s) and attach documentation

NA

Approved by		***Date***
Department Chair	Hari Kalva	11/27/2023
College Curriculum Chair	Masoud Jahandar Lashaki	11/28/2023
College Dean		11/28/2023
UGPC Chair		Dec 18, 2023
UGC Chair		Dec 18, 2023
Graduate College Dean		Dec 18, 2023
UFS President		
Provost		

Email this form and attachments to UGPC@fau.edu 10 days before the UGPC meeting.

COMPUTER ENGINEERING OR COMPUTER SCIENCE
DOCTOR OF PHILOSOPHY (PH.D.)

~~Qualifying~~ Candidacy Examination

~~Note:~~ ~~The qualifying exams for the Ph.D. in Computer Science and Computer Engineering are the same except for the course selections (see the application form).~~

The ~~qualifying~~ candidacy exam is ~~a written exam~~ intended to assess whether or not a student is ready to conduct research at the doctoral level and is able to publish in international conferences and journals. The exam must be passed for formal admission into the doctoral program. Students seeking the Ph.D. degree are expected to take the exam after completing 9 credits ~~during the second semester~~ of their doctoral studies~~, excluding the summer semester.~~ A student failing the candidacy exam may, upon re-application, take it a second time. Two failures will normally result in the student's dismissal from the PhD program. Specific instructions for applying and taking the Candidacy Examination are detailed on the EECS department website:

https://www.fau.edu/engineering/eecs/graduate/phd/ce/

~~The exam addresses the student's knowledge of graduate and undergraduate course material and basic mathematical concepts and engineering methods required for research and professional practice at the doctoral level. The exam consists of six problems (one from each course) related to material covered in recent FAU graduate and undergraduate CS/CE courses. The exam is administered two times a year in the fall and spring semesters. Two 3-hour sessions, morning and afternoon, cover tree courses each. The student can bring three 2-sided pages of notes and a simple calculator to each session, but no books, computers or phones. An overall minimum score of 70 percent or better is required to pass. A student failing the written exam may, upon re-application, take it a second time. Normally two failures will result in the student's dismissal from the Ph.D. program.~~

~~Application for Qualifying Exam~~

~~Students need to fill out and submit an application for the qualifying exam. In filling out the form, the student should list six courses, at most four of which may be at the graduate level and at least two of which must be at the undergraduate~~

~~level and selected from one of the lists below. Students can select at most one graduate course outside the Department of Electrical Engineering and Computer Science with the approval of the advisor. All other courses must have been offered by the department during the preceding three years, but the student may have taken them anywhere or prepared for them on their own. The student will also list a primary area of research and at least one secondary area.~~

~~The application must be approved by the student's advisor and then submitted to the graduate committee. Upon approving the application, the graduate committee will arrange for the exam preparation.~~

~~Undergraduate courses for Computer Engineering students:~~

~~Introduction to Logic Design~~	~~CDA 3201C~~
~~Introduction to Microprocessor Systems~~	~~CDA 3331C~~
~~Computer Architecture~~	~~CDA 4102~~
~~Data Structures and Algorithm Analysis~~	~~COP 3530~~
~~Computer Operating Systems~~	~~COP 4610~~
~~Stochastic Models for Computer Science~~	~~STA 4821~~

~~Undergraduate courses for Computer Science students:~~

~~Introduction to Logic Design~~	~~CDA 3201C **or**~~
~~Computer Architecture~~	~~CDA 4102~~
~~Data Structures and Algorithm Analysis~~	~~COP 3530~~
~~Computer Operating Systems~~	~~COP 4610~~
~~Design and Analysis of Algorithms~~	~~COT 4400~~
~~Theory of Computation~~	~~COT 4420~~
~~Stochastic Models for Computer Science~~	~~STA 4821~~

Dissertation Committee

Students are encouraged to interact with faculty members of the department to select a dissertation advisor and research area/topic for their dissertation. After a student has passed ~~both parts of~~ the ~~Qualifying~~ Candidacy Examination, a dissertation committee shall be formed to supervise the student's research work. The committee will consist of at least four faculty members who are familiar with the research area, at least three of whom are regular faculty members of the

department. At least one member of the committee ~~must~~ is recommended to be from outside the department (could also be from another institution or industry), and this member should have an academic or professional level compatible with the rest of the committee. The committee is chaired by the student's dissertation advisor. The chair of the committee must be a faculty member from the Department of Electrical Engineering and Computer Science. Students are expected to work in close cooperation with their dissertation committee and to keep the committee members informed about their progress on a regular basis. The dissertation committee should meet with the student at least once a semester to review the progress of the research work.

ELECTRICAL ENGINEERING
DOCTOR OF PHILOSOPHY (PH.D.)

~~Qualifying~~ Candidacy Exam

The ~~qualifying~~ candidacy exam is ~~a written exam~~ intended to assess whether or not a student is ready to conduct research at the doctoral level and is able to publish in international conferences and journals. The exam must be passed for formal admission into the doctoral program. Students seeking the Ph.D. degree are expected to take the exam after completing 9 credits ~~during the second semester~~ of their doctoral studies~~, excluding the summer semester~~. A student failing the candidacy exam may, upon re-application, take it a second time. Two failures will normally result in the student's dismissal from the PhD program. Specific instructions for applying and taking the Candidacy Examination are detailed on the EECS department website:

https://www.fau.edu/engineering/eecs/graduate/phd/ce/

~~The exam addresses the student's knowledge of graduate and undergraduate course material and basic mathematical concepts and engineering methods required for research and professional practice at the doctoral level. The exam consists of six problems (one from each course) related to material covered in recent FAU graduate and undergraduate courses. The exam is administered twice a year in the fall and spring semesters. Two, three-hour sessions, morning~~

~~and afternoon, cover three courses each. The student can bring three, two-sided pages of notes and a simple calculator to each session, but no books, computers or phones. An overall minimum score of 70 percent or better is required to pass. A student failing the written exam may, upon re-application, take it a second time. Normally two failures result in dismissal from the Ph.D. program.~~

~~**Application for Qualifying Exam**~~

~~Students fill out and submit an application for the qualifying exam. In filling out the form the student should list six courses, at most four of which may be at the graduate level and at least two of which must be at the undergraduate level, selected from the list below. Students can select at most one graduate course outside the Department of Electrical Engineering and Computer Science with the approval of the advisor. All other courses must have been offered by the department during the preceding three years, but the student may have taken them anywhere or prepared for them on their own. The student also lists a primary area of research and at least one secondary area.~~

~~The application must be approved by the student's advisor and then submitted to the graduate committee. Upon approval, the graduate committee arranges for exam preparation.~~

~~***Undergraduate courses for Electrical Engineering students***~~

~~Electromagnetic Fields and Waves~~	~~EEL 3470~~
~~Electronics 2 and Lab~~	~~EEE 4361C~~
~~Introduction to Digital Signal Processing~~	~~EEE 4510~~
~~Stochastic Processes and Random Signals~~	~~EEE 4541 or~~
~~Stochastic Models for Computer Science~~	~~STA 4821~~
~~Principles of Communication Systems~~	~~EEL 4512C~~
~~Controls Systems 1~~	~~EEL 4652C~~
~~Analysis of Linear Systems~~	~~EEL 4656~~

Admission to Candidacy

To be considered for the doctoral candidacy:

1. The student must pass the ~~Qualifying~~ Candidacy Examination (~~QE~~ CE) administered ~~semiannually~~ by the department. ~~The examination is based on electrical engineering coursework as outlined in the Ph.D. Qualifying Examination Brochure. This QE must be taken by all students after completion of 9 credits of Ph.D. coursework. A student who fails the~~

~~examination may be allowed a second attempt subject to departmental approval.~~

2. Following successful completion of the ~~QE~~ CE, the student must find a qualified faculty member in the department willing to chair the doctoral (dissertation) committee. The dissertation committee chair will then consult with the student to form the complete committee. Working with this dissertation committee chair, the student must complete the official Admission to Candidacy application along with the approved Plan of Study.

Dissertation Committee

Students are encouraged to interact with faculty members of the department to select a dissertation advisor and research area/topic for their dissertation. After a student has passed ~~both parts of~~ the ~~qualifying~~ candidacy exam, a dissertation committee shall be formed to supervise the student's research work. The committee should consist of at least four faculty members who are familiar with the research area, three of whom are regular faculty members of the department. At least one member of the committee ~~must~~ is recommended to be from outside the department (could be from another institution or industry), and this member should have an academic or professional level compatible with the rest of the committee. The committee is chaired by the student's dissertation advisor. The chair of the committee must be a faculty member from the Department of Electrical Engineering and Computer Science. Students are expected to work in close cooperation with their dissertation committee and keep the committee members informed about their progress on a regular basis. The dissertation committee should meet with the student at least once a semester to review the progress of the research work.

https://www.fau.edu/engineering/eecs/graduate/phd/ce/

PhD with Major in
Computer Science/Computer Engineering/Electrical Engineering

PhD Candidacy Examination

The purpose of the PhD Candidacy Examination in the Department of Electrical Engineering and Computer Science is for the doctoral student to demonstrate the student's ability to identify, undertake, and analyze a specific substantive area (or areas) of research in electrical engineering, computer engineering, or computer science. This exam must be passed for formal admission into candidacy in the doctoral program. A student failing the exam may, upon re-application, take it a second time. Two failures will normally result in the student's dismissal from the PhD program.

Procedure for Candidacy Examination

1. The student is expected to take graduate courses and select a Dissertation Advisor during the first year of the PhD program.
2. Upon completing at least 9 credit hours and not more than 24 credit hours of graduate course work (including credit hours of Directed Independent Study and Advanced Research), a PhD student may request to take the PhD Candidacy Exam. A student entering the PhD program with a bachelor's degree (direct-path PhD student) is expected to take the PhD Candidacy Exam upon completing at least 24 credit hours and not more than 36 credit hours of graduate course work (including credit hours of Directed Independent Study and Advanced Research).
3. The student will submit the Candidacy Exam Request Form, approved by the dissertation advisor, by a specified deadline—a date in September (Fall semesters) or January (Spring semesters).
4. The Candidacy Exam Coordinator, in consultation with the Graduate Programs Committee, will appoint three members of the Candidacy Exam Committee for each student (based on student's major and research background), one of them designated as committee chair who will lead the examination. The student's dissertation advisor is not a member of the Candidacy Exam Committee.
5. The Candidacy Exam coordinator, in consultation with the Graduate Program Committee, will announce between 5 and 10 research papers from 5 or 6 prominent research areas. For the sake of the exam, each student will select one research paper.

6. After the paper selection, the student has 4 weeks to prepare a 20 to 30-minute PowerPoint presentation to the committee based on the paper. To demonstrate potential to begin doctoral-level research, the student must show the ability to perform the following tasks and answer questions about each:
    - State a problem and provide motivation and requirements for a solution for the problem.
    - Describe the novelty of the work as compared to the field in general.
    - Determine if a proposed solution to the problem is correct and meets the requirements for the solution.
    - Describe how the problem and presumed solution fit in the broader research context.
    - Describe the meaning of mathematical equations (or models) used in the paper.
    - Describe the system's performance evaluation and results if present in the paper.
    - Identify and describe the limitations of the work.

Candidate Evaluation

The PhD Candidacy Committee will discuss and finalize their vote. Each committee member will vote (Pass or Fail) based on the overall quality of the oral presentation, understanding of the research problem and presented solution in the seminal paper, and research area in general. The student requires at least two out of three "Pass" votes to pass the exam.