2023-2024 Graduate Student Handbook

SCHOOL OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE

Office of the Graduate Program Coordinator
SCHOOL OF EECS | WASHINGTON STATE UNIVERSITY

Contents

Programs Offered

Master of Science

The School of Electrical Engineering & Computer Science offers the following Master of Science degree programs available for students on the WSU Pullman and WSU Tri-Cities campuses unless specified:

- Computer Engineering M.S. – Thesis or Non-Thesis
- Computer Science M.S. – Thesis or Non-Thesis
- Electrical Engineering M.S. – Thesis or Non-Thesis
- Software Engineering M.S. – Non-Thesis online program

Doctor of Philosophy

The School of Electrical Engineering & Computer Science offers the following Doctor of Philosophy degree programs available for students on the WSU Pullman, WSU Tri-Cities and WSU Vancouver campuses:

- Computer Science Ph.D.
- Electrical & Computer Engineering Ph.D.

Research Areas

Computer Science

- Algorithms & Theory of Computing
- Computer Networks & Distributed Computing
- Machine Learning & Artificial Intelligence
- Data Science
- Bioinformatics & Computational Biology
- High Performance Computing
- Human-Computer Interaction
- Software Engineering

Electrical & Computer Engineering

- Power Engineering
- Microelectronics
- Electromagnetics & Optical Communications
- Control Systems
- Signal Processing & Communications
- Embedded Systems

EECS Graduate Admission

Admission

The School of Electrical Engineering & Computer Science evaluates applicants for admission to its graduate programs based on college transcripts, undergraduate/graduate GPA, GRE score, letters of recommendation (minimum of three), a statement of purpose, and an English language proficiency score (if applicable).

Apply online at http://www.gradschool.wsu.edu/apply. Any physical application materials must be mailed directly to the Graduate School, not to the department, via the following address:

Graduate School Admissions
French Administration, Room
324 Washington State University
Pullman, WA 99164-1030

Applications will be evaluated by the EECS Graduate Studies Committee and applicants deemed most qualified will be recommended to the Graduate School for admission. Please note that admission may be denied by the Graduate School if an applicant does not meet the minimum university standard for admission.

Program Admission Prerequisites

Computer Engineering
Specific Admission Recommendations for Students with non-Computer Engineering Background

Students whose undergraduate studies did not include material equivalent to that covered in the following WSU courses may be asked to take coursework to resolve that deficiency: *CPT_S 121, 122, 360, E_E 214, 234, 324, 334, & MATH 216.* The committee may require the student to complete other undergraduate deficiencies including courses that are prerequisite to graduate courses.

Computer Science
Specific Admission Recommendations for Students with non-Computer Science Background

Students whose undergraduate studies did not include material equivalent to the following WSU courses may be asked to take coursework to resolve that deficiency: *CPT_S 121, 122, 223, 260, 317, 350, 355, 360, PHIL 201, & MATH 216.* The committee may require the student to complete other undergraduate deficiencies including courses that are prerequisite to graduate courses.

Electrical Engineering
Specific Admission Recommendations for Students with non-Electrical Engineering Background

Students whose undergraduate studies did not include material equivalent to that covered in the following WSU courses may be asked to take coursework to resolve that deficiency: *E_E 214, 234, 261, 311, 321, 331, 352, & any three of E_E 341, 351, 361, or CPT_S 360.* The committee may require the student to complete other undergraduate deficiencies including courses that are prerequisite to graduate courses.

Software Engineering
Admission Requirements
The School of Electrical Engineering & Computer Science evaluates applicants for admission to its graduate programs based on college transcripts, undergraduate/graduate GPA (minimum 3.0), letters of recommendation (minimum of three), a statement of purpose, and an English language proficiency score (if applicable). GRE is not required for admission to Online M.S. in Software Engineering program.

Program Admission Prerequisites

Specific Admission Recommendations for Students with non-Software Engineering and non-Computer Science Background
Students whose undergraduate studies did not include material equivalent to the following WSU courses may be asked to take coursework to resolve that deficiency: CPT_S 131 or 121, CPT_S 132 or 122, CPT_S 233 or 223 or 215.
These prerequisites can be waived if the applicant has taken equivalent courses in other institutions or if they have extensive industry experience in programming and/or software engineering. The admission committee will review the transcripts and applicant's work experience and suggest prerequisites that need to be completed (if any).

Required Application Materials

Graduate Record Exam (GRE)
The School of Electrical Engineering & Computer Science requires official scores for the general GRE as a part of the application package. There is no published minimum GRE score requirement for admission. GRE scores are not required for the Software Engineering online program.

English Language Proficiency
All international applicants must demonstrate a basic proficiency in English by submitting official Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS), or Michigan English Language Assessment Batter (MELAB) test scores. Scores must be less than two years old at the time of expected semester enrollment and sent directly to the Graduate School from the Educational Testing Service.

Please note the following exceptions to the English proficiency requirement:
- Applicants from Australia, Bahamas, Barbados, Botswana, Canada, Guyana, Kenya, United Kingdom, Republic of Ireland, Jamaica, New Zealand, Nigeria, and Trinidad & Tobago are exempt from the English proficiency requirement.
- International students who have or will have graduated with a baccalaureate-level or higher degree from an accredited four-year U.S. or Canadian college or university within two years of the expected semester of enrollment at the WSU Graduate School are not required to submit English proficiency test scores.

The ETS institutional code for WSU and the minimum acceptable TOEFL scores can be found on the Graduate School webpage for international applicant requirements: https://gradschool.wsu.edu/international-requirements/.

Letters of Recommendation
It is required that all applicants have at least three letters of recommendation submitted. These letters of recommendation can be academic or from a place of employment, or a combination.

Applicants should contact their references ahead of time to be sure they are willing to respond to the request for a recommendation. Applicants should ask them to discuss their leadership, academic standards, and skills as they pertain to the applicant's primary interest area. All references will be contacted automatically through the online application system when their information is entered on the application.

Transcripts
Unofficial transcripts are required for every college and university that the applicant has attended are required for the application review process. International applicants should supply unofficial transcripts in both the native language and an English translation. Applicants may upload copies of unofficial transcripts (and translations) via the online application.

Official transcripts will not be required until an applicant has been recommended for admission by the department. Any transcripts sent to the Graduate School as part of the application or admission process cannot be returned or transferred. All official transcripts must be delivered to the Graduate School in a stamped and sealed envelope.

Graduate Student Classifications

Advanced Degree Candidates

Regular Degree Seeking
This classification is for students admitted to the Graduate School with previous coursework averaging 3.0 or higher. This cumulative grade point average is taken from the graded undergraduate work or the graded graduate study of 12 semester hours or more taken after the receipt of a bachelor's degree. International students in this classification must have a grade point average equivalent to a U.S. grade of "B" or better in the last two years of coursework.

Provisional Degree Seeking
This classification is for students whose previous work, as defined above, is below 3.0. Provisional status may be granted because of special departmental recommendations or other indications of outstanding potential. A provisional degree seeking student must maintain a 3.0 GPA or higher; automatic reinstatement for first semester students whose GPA falls between 2.75 and 2.99 does not apply to provisionally admitted students. If a provisionally admitted student falls below a
3.0 GPA in their first semester of study, the department may choose not to reinstate the student.

Not Advanced Degree Candidates

Not Advanced Degree Candidate (NADC)

This classification is for those students with a baccalaureate degree who apply to a graduate program, but are not recommended by the graduate program for admission at the time of application. Generally, applicants are recommended to the NADC classification by the graduate program because the program has determined that the applicant is not academically prepared and additional preparatory work is necessary before they will be considered for admission.
Admission as NADC does not obligate the graduate program to admit the student to a degree program in the future.

Students may be admitted as NADC with less than a 3.0 cumulative GPA, but must maintain a 3.0 GPA once admitted. These students may take any course for which they have the necessary prerequisites, except those at the 700- or 800-level.

A maximum of six credit hours of graduate coursework with grades of "B" or higher (nine for non-thesis master's or doctoral degree) earned under NADC classification (and post-baccalaureate) may be applied to graduate degree, Program of Study, requirements. Post-baccalaureate students must complete and submit a Reservation of Graduate Credit form for approval at the time of registration. Time limits on the coursework are the same as for transfer credit.

General Academic Requirements

Enrollment

Students Receiving Financial Support
Each Graduate Student receiving financial support from the School of Electrical Engineering & Computer Science in the form of a Teaching Assistantship (TA), Research Assistantship (RA), or a Fellowship must register for at least ten credit hours. At least nine of those credits should be graded courses unless the student is near the end of their program and coursework is near completion. The remainder of the credits may consist of research credits, E_E/CPT_S 700 or 800.

Students considering dropping or withdrawing from a course that will put them below the enrollment requirements listed above should have the approval of their faculty advisor, International Programs (if applicable), and the Graduate Studies Committee.

International Students
International students are responsible for maintaining their own visa status, with the assistance of the International Programs office.

Typically, students must be enrolled in at least ten credits in order to be considered full-time and maintain their visa status. Students may apply for a Reduced Course Load via the International Programs office if less than ten credits are remaining for completion of their degree. Note that an approved Program of Study must be on file with the Graduate School before a student is able to apply for Reduced Course Load.

Continuous Enrollment

Master's Degree Students
All master's degree students are required to enroll for a minimum of two credits every fall and spring semester until they complete all of their degree requirements. Graduate Leave is available to those degree-seeking students who are in good standing, but must be away from campus for personal reasons. See Graduate School Policies & Procedures for more information regarding Graduate Leave, including Internship Leave: https://gradschool.wsu.edu/chapter-five-a6-7/. Please note that international students must consult with International Programs regarding personal or internship leave and discuss the enrollment requirements with them.

If a master's degree student does not register for credit or go into approved Graduate or Internship Leave status, their absence is considered to be unapproved. Such students may reenroll and will need to pay a $25 reenrollment fee if they are absent for less than three semesters (excluding the summer). Reenrollment also requires departmental approval and is not guaranteed. Students who are absent for three consecutive semesters (excluding the summer) will be dropped from the Graduate School.

Doctoral Students
Prior to Preliminary Exams:

Prior to taking preliminary exams, all doctoral students are required to enroll for a minimum of two credits every fall and spring semester until they complete all of their degree requirements. Graduate leave is available to those students who are in good standing, but must be away from campus for personal reasons. See Graduate School Policies & Procedures for more information regarding Graduate Leave, including Internship Leave: https://gradschool.wsu.edu/chapter-five-a6-7/. Please note that international students must consult with International Programs regarding personal or internship leave and discuss the enrollment requirements with them.

If a doctoral student does not register for credit or go into approved Graduate or Internship Leave status, their absence is considered to be unapproved. Such students may reenroll and will need to pay a $25 reenrollment fee if they are absent

for less than three semesters (excluding the summer). Reenrollment also requires departmental approval and is not guaranteed. Students who are absent for three consecutive semesters (excluding the summer) will be dropped from the Graduate School.

After Successful Completion of Preliminary Exams:

After successful completion of preliminary exams, doctoral students are expected to continue to enroll for research credits each semester until they defend their dissertation. There is a three-year deadline from the date of the preliminary exam to the date of degree completion. Students who have taken their preliminary exams, have met all of their program requirements except completion of their dissertation, and do not have the funding to register for two or more research credits will be placed into Continuous Doctoral Status (CDS) for a limited number of semesters. Students in CDS will be charged a $50 per semester administrative fee and will have limited access to University resources. See Graduate School Policies & Procedures for more information regarding CDS: https://gradschool.wsu.edu/chapter-five-a2/.

Transferring Credits from External Institutions

Regulations

Graded graduate-level coursework (with a grade of B or higher) taken toward a master's degree at an accredited institution may be used toward a doctoral degree at WSU per approval via the based on the process outlined below. However, graded graduate-level coursework taken toward a completed master's degree may not be used toward another master's degree at WSU. All other graduate-level coursework (with a grade of B or higher) taken as a graduate student, but not toward a completed graduate degree, may be used toward a master's degree or a doctoral degree at WSU per approval via the process outlined below. In all transfer cases, the number of transferrable credit hours is limited to no more than half of the total graded course credits required by the program as outlined in later sections of the EECS Graduate Student Handbook. None of the transferred credit used to complete a degree at WSU may be applied toward another advanced degree.

All transfer course requests must have an equivalent course that has been taught within the School of EECS at WSU; special topics courses that do not have an equivalent counterpart at WSU will not be considered for transfer. Only six total credits of Special Topics courses may be transferred for use on your Program of Study. No core courses used toward your degree requirements may be transferred.

Transfer credits are subject to the usual time restrictions for master's or doctoral degrees and certificates, and approval by the department and Graduate School. Credits cannot be more than six years old for a master's or certificate program and ten years old for a doctoral degree at the time of graduation.

Procedure
1. Students must have all transfer coursework evaluated and approved prior to the submission of the Program of Study; all transfer processes should be initiated within the first year of enrollment in an EECS graduate degree program.
2. With the support of their faculty advisor, a student will create a program of study draft, identifying the courses to be transferred and how they will be applied to the student degree. The program of study draft form (example in Appendix) can be found on the EECS graduate student webpages or requested from the Graduate Program Coordinator.
3. The student will complete a transfer request form (example in Appendix) for each course that they wish to transfer. Each form, available online or from the Graduate Program Coordinator, must be accompanied by supporting materials including a syllabus, transcripts, course materials, textbook information, etc.
4. The program of study draft and all transfer request forms must be submitted in a packet with one petition to transfer graduate coursework cover page (example in Appendix). This packet should then be submitted, electronically or hard copy, to the Graduate Program Coordinator.

5. Once the completed packet has been received, the Graduate Program Coordinator, in coordination with the GSC, will select an appropriate faculty member to review the content of each course to determine if it is approved for transfer.
6. The student should keep a copy of all transfer materials and approval letters for submission with the official Program of Study.

Graduate Student Evaluations

All Students
Each year the progress of every student will be reviewed by their faculty advisor. A written and signed copy of this evaluation will be placed in the student's file. A copy of this evaluation is available to the student on request. This review, conducted by the EECS Faculty, should indicate the student's progress on coursework and research, when applicable. The evaluation will occur at the end of the spring semester, unless there is a reason for a fall review.

Teaching Assistants
Performance of Teaching Assistants (TAs) will be evaluated by the instructor and the students for the course(s) to which they are assigned. Instructors will have evaluation distributed and collected by the Graduate Program Coordinator, available to the student on request. Students will have the opportunity to evaluate TA performance during the course evaluation process, available for review in the semester after the review was completed. The student evaluation process is not conducted by the department or the Graduate Program Coordinator.

Assistantship Renewal
The Graduate Studies Committee will review all data available, including student evaluations and TA evaluations, at the time of the assistantship renewal process. Students may not be reappointed if performance and academic progress are deemed unsatisfactory.

Maximum Timeframe for Degree Completion

Ph.D. Program

Most students enrolled in doctoral degree programs at WSU require 4-6 years for completion of their program. There are two-time limitations for doctoral students:

1. The maximum time allowed for completion of a doctoral degree is ten years from the beginning date of the earliest course applied toward the degree. This means that the courses (including transfer coursework) on the Program of Study remain valid for only ten years from the earliest date of the courses being applied toward the degree.
2. The doctoral degree must be completed within three years of the date of satisfactory completion of the Preliminary Examination.

It is imperative that students work closely with their advisor and committee to develop a timeline for completion that successfully accommodates both of these deadlines. At least four months must lapse between the Preliminary and Final Doctoral Examinations.

M.S. Program

Most full-time students enrolled in master's degree programs at WSU require 2-3 years for completion of their program. The maximum time allowed for completion of a master's degree is six years from the beginning date of the earliest course applied toward their degree (including transfer coursework).

Procedure to Request Extension to Degree Completion

For students who are not able to complete their degree within the specified maximum timeframe outlined above, you may request an extension to the degree program.

Students may request up to three extensions, however none of these extensions are guaranteed to be approved by the student's advisor, department, or the Graduate School. Policies and procedures for extension requests are located in the Graduate School Policies & Procedures.

Grade Requirements

Minimum GPA
Deficiency
Graduate students are required to maintain a minimum of 3.0 cumulative GPA. Those who fall below this threshold are considered deficient and may be subject to dismissal.

Reinstatement
Graduate students whose cumulative GPA falls below a 3.0 are considered academically deficient and must be reinstated in order to continue in the program. In order to apply for reinstatement for the following semester, the student's faculty advisor will need to send a memo of support to the Graduate Program Coordinator. The student will also need to meet with the Graduate Program Coordinator and GSC Chair to discuss an academic plan to raise the cumulative GPA above a 3.0, or at least obtain a 3.3 GPA in the subsequent semester. Students who obtain a 3.3 semester GPA but still do not meet the cumulative 3.0 GPA requirement are permitted to apply for a second reinstatement.

Core Course Grade Requirements

M.S. Degree Grade Requirements
All core and required courses (as listed within the relevant degree area) must be passed with a B- or better. Core courses will be indicated by the student on the Core Course, Focus Area, & Minor form (example in Appendix).

Ph.D. Grade Requirements
All core and required courses must be passed with a B or better, unless otherwise noted. Core courses and minor area will be indicated by the student on the Core Course, Focus Area, & Minor form (example in Appendix).

Retaking Courses

A student that receives a grade of C- or less will be able to register to take that class again on their own. If a student earns a grade of C or higher, but does not meet the departmental required grade for a course, they will need to submit a Petition to Add, Drop, or Withdraw from Courses (as found on the Graduate School's Forms webpage) to the Graduate Program Coordinator during the next semester in which the course is offered. The student will explain on the form that they did not meet the required grade based on departmental regulations and get signatures from their advisor and the course instructor before submitting the form to the Graduate Program Coordinator.

Program of Study

Definition

The Program of Study (available on the Graduate School Forms page) is an official form documenting the student's plan for courses to take as well as indicating their research interests. For master's degree students, the Program of Study should be filed with the Graduate School as soon as possible, but no later than the beginning of the semester preceding the anticipated semester of graduation. For example, if a student plans to graduate in the spring, the Program of Study is due no later than the beginning of the preceding fall semester. For doctoral students, the Program of Study must be filed with the Graduate School before the end of the third semester of study (October 1 deadline for fall; March 1 deadline for spring). The student's faculty advisor, in consultation with suggested committee members, should assist the student in the development of their proposed Program of Study.

General Requirements

In addition to satisfying the academic requirements of your program, as presented in this handbook, all Program of Study must meet the Graduate School requirements as listed in the Policies & Procedures manual on the Graduate School website.

Filing the Program of Study

After the proposed Program of Study form is completed by the graduate student, it must be signed by each advisory committee member and submitted to the Graduate Program Coordinator for approval. Once the Graduate Program Coordinator has determined that the Program of Study matches the minimum guidelines for a student's chosen program and Focus Area(s) as applicable, it will be given to the GSC Chair or EECS Director for signature. The Graduate Program Coordinator will then submit the form to the Graduate School for their final approval based on departmental and university-wide requirements.

Changing the Program of Study

Changes made to the Program of Study must be documented with the appropriate signatures, signifying the endorsement of the committee chair and the approval of the Chair of the program, and submitted to the Graduate School. If program changes are made, the Program Change form must be completed, signed, and submitted to the Graduate School before a student applies for their degree through Application for Degree and Graduation Form.

Fulfilling the Program of Study

Once approved and submitted, the Program of Study becomes the basis of the course requirements for the degree. As noted on the Program of Study form itself, any course listed on an approved Program of Study must be completed with a grade of C or better. If a course is not completed with a C or better, it must be retaken, and an appropriate grade earned, before the student can graduate. A course with a grade lower than a C cannotot be removed from the Program of Study.

Guidelines for Directed Study
E_E or CPT_S 595

The student and their directed study instructor will provide an abstract of the planned work by the end of the second week of the semester. A copy of the abstract must be filed with the Graduate Program Coordinator for enrollment.

A report describing the work must be submitted at the end of the semester. If a conference or journal paper or Tech Report is generated, a separate report is not necessary.

Master's Degree Requirements

M.S. Computer Engineering

Thesis Option
Course Requirements
Students in the M.S. Computer Engineering – Thesis program must complete the following coursework for their Program of Study:
- 30 total credits – minimum
  - 21 graded credits – minimum
    - 18 E_E/CPT_S credits – minimum
    - 6 credits non-graduate (400-level) credits – maximum
    - 6 transferred credits – maximum
    - 3 Directed Study credits (E_E/CPT_S 595) – maximum
  - 9 E_E 700 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental aspects of computer engineering, the student must successfully complete at least three of the following Core Courses with a grade of B- or better:
- **Core Courses**
  - E_E 524/CPT_S 561 – Advanced Computer Architecture
  - E_E 530 – Digital Signal Processing II
  - E_E 586 – VLSI Systems Design
    - NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
  - E_E 587 – System on Chip (SoC) Design & Test
    - NOTE: If E_E 587 is not available, E_E 434 (ASIC & Digital Systems Design) may be substituted
  - CPT_S 560 – Operating Systems

Final Examination – Thesis Defense
The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework, applied for the degree, and had their thesis approved by their committee. A List of Publications should also be submitted to the GSC prior to scheduling of exam. The list should include all publications submitted, accepted, or in preparation as well as the full name of the conference or journal for which they were submitted and the (anticipated) date of submission or appearance. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. Note that the student must be enrolled in a minimum of two E_E 700 credits during the final exam semester.

The examination will be administered by the student's committee and will cover the thesis defense and the area of knowledge covered by the student's Program of Study. The committee members must vote on passage or failure; and any other member of permanent EECS faculty may attend and vote at the examination. In the event of a failed examination, a second and final attempt may be scheduled after a lapse of at least three months.

If the student's thesis is approved and the oral defense is passed, the student must provide a digital copy of the thesis to the School of EECS. The thesis must be formatted in accordance with University and Graduate School

requirements, and all changes suggested by the student's committee must be made in the final version. Students are encouraged to submit the results of the thesis research to a refereed journal.

Non-Thesis Option
Course Requirements
Students in the M.S. Computer Engineering – Non-Thesis program must complete the following coursework for their Program of Study:
- 31 total credits – minimum
  - 27 graded credits – minimum
    - 18 E_E/CPT_S credits – minimum
    - 9 credits non-graduate (400-level) credits – maximum
    - 6 transferred credits – maximum
    - 3 Directed Study credits (E_E/CPT_S 595) – maximum
  - 4 E_E 702 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental aspects of computer engineering, the student must <u>successfully complete at least three of the following Core Courses</u> with a grade of B- or better:
- **Core Courses**
  - E_E 524/CPT_S 561 – Advanced Computer Architecture
  - E_E 530 – Digital Signal Processing II
  - E_E 586 – VLSI Systems Design
    - NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
  - E_E 587 – System on Chip (SoC) Design & Test
    - NOTE: If E_E 587 is not available, E_E 434 (ASIC & Digital Systems Design) may be substituted
  - CPT_S 560 – Operating Systems

Final Examination

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework and applied for the degree.. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. In the case of the written exam detailed below, the scheduling form will denote a Ballot Meeting that the student does not need to attend. Note that the student must be enrolled in a minimum of two E_E 702 credits during the final exam semester.

The final exam consists of a portfolio of representational projects from the student's Master's course work, a resume/CV, a LinkedIn profile, and a brief response to an assigned paper. The committee will assign a research paper related to the student's Focus Area(s), together with a specific set of questions. The student will be asked to write a 5-page report (in scientific format) that addresses the questions and submit it to the committee before the date determined on the exam scheduling form. The committee will then grade the entire final exam submission to determine a Pass/Fail grade and forward the signed examination ballots to the Graduate School.

M.S. Computer Science

Thesis Option

Course Requirements

Students in the M.S. Computer Science – Thesis program must complete the following coursework for their Program of Study:

- 33 total credits – minimum
  - 24 graded credits – minimum
    - 18 E_E/CPT_S credits – minimum
    - 6 credits non-graduate (400-level) credits – maximum
    - 6 transferred credits – maximum
    - 3 Directed Study credits (E_E/CPT_S 595) – maximum
  - 9 CPT_S 700 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental areas, each M.S. Computer Science – Thesis student must complete the following course requirements with a grade of B- or better:

- CPT_S 515 – Advanced Algorithms or CPT_S 516 – Algorithmics
- <u>All Core Courses and a minimum of 2 Advanced Courses for a student's chosen Focus Area</u>

  - **Artificial Intelligence & Machine Learning**
    - **Core Courses**
      - CPT_S 540 – Artificial Intelligence
      - CPT_S 570 – Machine Learning
    - **Advanced Courses**
      - CPT_S 534 – Neural Network Design & Application
      - CPT_S 543 – Human-Computer Interaction
      - CPT_S 580 in following topics:
        - Reinforcement Learning
        - Structured Prediction: Algorithms & Applications
        - Gerontechnology
        - Smart Health
        - Other Special Topics taught by AI & Machine Learning faculty
  - **Data Science**
    - **Core Courses**
      - CPT_S 575 – Data Science
      - CPT_S 570 – Machine Learning
    - **Advanced Courses**
      - CPT_S 415 – Big Data
      - CPT_S 553 – Graph Theory
      - CPT_S 571 – Computational Genomics
      - CPT_S 580 in following topics
        - Advanced Databases
        - Other Special Topics taught by Data Science faculty
      - CPT_S 591 – Elements of Network Science

- **Systems, Networking, & Security**
  - **Core Courses**
    - CPT_S 527 – Computer Security
    - CPT_S 564 – Distributed Systems Concepts & Programming
  - **Advanced Courses**
    - CPT_S 411 – Introduction to Parallel Computing
    - CPT_S 555 – Computer Communication Networks
    - CPT_S 560 – Operating Systems
    - CPT_S 561 – Advanced Computer Architecture
    - CPT_S 566 – Embedded Systems
    - CPT_S 580 in following topics
      - Advanced Distributed Systems
      - Other Special Topics taught by Systems & Networking faculty
    - CPT_S 591 – Elements of Network Science
- **Software Engineering**
  - **Core Courses**
    - CPT_S 584 – Software Requirements
    - CPT_S 587 – Software Design & Architecture
  - **Advanced Courses**
    - CPT_S 527 – Computer Security
    - CPT_S 580 topics taught by Software Engineering faculty
    - CPT_S 581 – Software Maintenance
    - CPT_S 582 – Software Testing
    - CPT_S 583 – Software Quality
- **Visual & Scientific Computing**
  - **Core Courses**
    - CPT_S 542 – Computer Graphics
    - CPT_S 530 – Numerical Analysis
  - **Advanced Courses**
    - CPT_S 483 – Special Topics: Introduction to Virtual Reality
    - CPT_S 543 – Human-Computer Interaction
    - CPT_S 548 – Advanced Computer Graphics
    - CPT_S 553 – Graph Theory
    - CPT_S 571 – Computational Genomics
    - CPT_S 572 – Numerical Methods in Computational Biology
    - CPT_S 591 – Elements of Network Science
    - MATH 540 – Applied Mathematics

Final Examination – Thesis Defense

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework, applied for the degree, and had their thesis approved by their committee. A List of Publications should also be submitted to the GSC prior to scheduling of exam. The list should include all publications submitted, accepted, or in preparation as well as the full name of the conference or journal for which they were submitted and the (anticipated) date of submission or appearance. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. Note that the student must be enrolled in a minimum of two CPT_S 700 credits during the final exam semester.

If the student's thesis is approved and the oral defense is passed, the student must provide a digital copy of the thesis to the School of EECS. The thesis must be formatted in accordance with University and Graduate School requirements, and all changes suggested by the student's committee must be made in the final version. Students are encouraged to submit the results of the thesis research to a refereed journal.

Non-Thesis Option

Course Requirements

Students in the M.S. Computer Science – Non-Thesis program must complete the following coursework for their Program of Study:

- 30 total credits – minimum
    - 26 graded credits – minimum
        - 18 E_E/CPT_S credits – minimum
        - 9 credits non-graduate (400-level) credits – maximum
        - 6 transferred credits – maximum
        - 3 Directed Study credits (E_E/CPT_S 595) – maximum
    - 4 CPT_S 702 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental areas, each M.S. Computer Science – Non-Thesis student must complete the following course requirements with a grade of B- or better:

- CPT_S 515 – Advanced Algorithms or CPT_S 516 – Algorithmics
  Two courses each from two different focus areas (one course cannot be used for multiple requirements)

    - Artificial Intelligence & Machine Learning
        - CPT_S 534 – Neural Network Design & Application
        - CPT_S 540 – Artificial Intelligence
        - CPT_S 543 – Human-Computer Interaction
        - CPT_S 570 – Machine Learning
        - CPT_S 580 in following topics:
            - Reinforcement Learning
            - Structured Prediction: Algorithms & Applications
            - Gerontechnology
            - Smart Health
              Other Special Topics taught by AI & Machine Learning faculty
    - **Data Science**
        - CPT_S 415 – Big Data
        - CPT_S 553 – Graph Theory
        - CPT_S 570 – Machine Learning
        - CPT_S 571 – Computational Genomics
        - CPT_S 575 – Data Science
        - CPT_S 580 in following topics
            - Advanced Databases
            - Other Special Topics taught by Data Science faculty
        - CPT_S 591 – Elements of Network Science

    - **Systems, Networking, & Security**
        - CPT_S 411 – Introduction to Parallel Computing
        - CPT_S 527 – Computer Security

- CPT_S 555 – Computer Communication Networks
- CPT_S 560 – Operating Systems
- CPT_S 561 – Advanced Computer Architecture
- CPT_S 564 – Distributed Systems Concepts & Programming

- CPT_S 566 – Embedded Systems
- CPT_S 580 in following topics
  - Advanced Distributed Systems
  - Other Special Topics taught by Systems & Networking faculty
- CPT_S 591 – Elements of Network Science

- **Software Engineering**
  - CPT_S 584 – Software Requirements
  - CPT_S 587 – Software Design & Architecture
  - CPT_S 527 – Computer Security
  - CPT_S 580 topics taught by Software Engineering faculty
  - CPT_S 581 – Software Maintenance
  - CPT_S 582 – Software Testing
  - CPT_S 583 – Software Quality
  -
- **Visual & Scientific Computing**
  - CPT_S 483 – Special Topics: Introduction to Virtual Reality
  - CPT_S 530 – Numerical Analysis
  - CPT_S 542 – Computer Graphics
  - CPT_S 543 – Human-Computer Interaction
  - CPT_S 548 – Advanced Computer Graphics
  - CPT_S 553 – Graph Theory
  - CPT_S 571 – Computational Genomics
  - CPT_S 572 – Numerical Methods in Computational Biology
  - CPT_S 591 – Elements of Network Science
  - MATH 540 – Applied Mathematics I

Final Examination

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework and applied for the degree. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. In the case of the written exam detailed below, the scheduling form will denote a Ballot Meeting that the student does not need to attend. Note that the student must be enrolled in a minimum of two CPT_S 702 credits during the final exam semester.

The final exam consists of a portfolio of representational projects from the student's Master's course work, a resume/CV, a LinkedIn profile, and a brief response to an assigned paper. The committee will assign a research paper related to the student's Focus Area(s), together with a specific set of questions. The student will be asked to write a 5-page report (in scientific format) that addresses the questions and submit it to the committee before the date determined on the exam scheduling form. The committee will then grade the entire final exam submission to determine a Pass/Fail grade and forward the signed examination ballots to the Graduate School.

M.S. Electrical Engineering

Thesis Option
Course Requirements
Students in the M.S. Electrical Engineering – Thesis program must complete the following coursework for their Program of Study:
- 30 total credits – minimum
  - 21 graded credits – minimum
    - 18 E_E/CPT_S credits – minimum
    - 6 credits non-graduate (400-level) credits – maximum
    - 6 transferred credits – maximum
    - 3 Directed Study credits (E_E/CPT_S 595) – maximum
  - 9 E_E 700 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental areas, each M.S. Electrical Engineering - Thesis student must complete the following course requirements:
- A minimum of two courses listed in a student's chosen Focus Area (completed with a B- or better)
  - **Focus Areas & Core Coursework**
    - **Systems Area**
      - E_E 501 – Linear System Theory
      - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
      - E_E 507 – Random Processes in Engineering
    - **Power Area**
      - E_E 521 – Analysis of Power Systems
      - E_E 523 – Power Systems Stability & Control or E_E 582 – Cyber-Power Systems
    - **Microelectronics**
      - E_E 571 – Advanced Wireless Integrated Circuits & Systems
      - E_E 596 – Advanced Analog Integrated Circuits
    - **Electrophysics**
      - E_E 518 – Advanced Electromagnetic Theory I
      - E_E 571 – Advanced Wireless Integrated Circuits & Systems
    - **Computer Engineering**
      - E_E 524 – Advanced Computer Architecture
      - E_E 586 – VLSI Systems Design
      - NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
- At least one additional course from the below list of Advanced Courses beyond the courses from a student's chosen Focus Area (completed with a B- or better)
  - **Advanced Courses**
    - E_E 501 – Linear System Theory
    - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
    - E_E 507 – Random Processes in Engineering
    - E_E 518 – Advanced Electromagnetic Theory I
    - E_E 521 – Analysis of Power Systems
    - E_E 523 – Power Systems Stability & Control or E_E 582 – Cyber-Power Systems
    - E_E 524 – Advanced Computer Architecture
    - E_E 555 – Computer Communication Networks
    - E_E 571 – Advanced Wireless Integrated Circuits & Systems
    - E_E 582 – Advanced Topics: Cyber Security

- E_E 586 – VLSI Systems Design
- E_E 596 – Advanced Analog Integrated Circuits
- CPT_S 516 – Algorithmics

Final Examination – Thesis Defense

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework, applied for the degree, and had their thesis approved by their committee. A List of Publications should also be submitted to the GSC prior to scheduling of exam. The list should include all publications submitted, accepted, or in preparation as well as the full name of the conference or journal for which they were submitted and the (anticipated) date of submission or appearance. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. Note that the student must be enrolled in a minimum of two E_E 700 credits during the final exam semester.

The examination will be administered by the student's committee and will cover the thesis defense and the area of knowledge covered by the student's Program of Study. The committee members must vote on passage or failure; and any other member of permanent EECS faculty may attend and vote at the examination. In the event of a failed examination, a second and final attempt may be scheduled after a lapse of at least three months.

If the student's thesis is approved and the oral defense is passed, the student must provide a digital copy of the thesis to the School of EECS. The thesis must be formatted in accordance with University and Graduate School requirements, and all changes suggested by the student's committee must be made in the final version. The results of the thesis research should be submitted to a refereed journal.

Non-Thesis Option
Course Requirements
Students in the M.S. Electrical Engineering – Non-Thesis program must complete the following coursework for their Program of Study:
- **31 total credits – minimum**
  - 27 graded credits – minimum
    - 18 E_E/CPT_S credits – minimum
    - 9 non-graduate (400-level) credits – maximum
    - 6 transferred credits – maximum
    - 3 Directed Study credits (E_E/CPT_S 595) – maximum
  - 4 E_E 702 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

Each M.S. Electrical Engineering – Non-Thesis student must choose a Focus Area (listed below) and will take a comprehensive examination in their area to serve as their non-thesis final exam. In order to fulfill the requirements on their Program of Study each student must complete the following requirements:

- A minimum of two courses listed in a student's chosen Focus Area (completed with a B- or better)
  - **Focus Areas & Core Coursework**
    - **Systems Area**
      - E_E 501 – Linear System Theory
      - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
      - E_E 507 – Random Processes in Engineering

- **Power Area**
  - E_E 521 – Analysis of Power Systems
  - E_E 523 – Power Systems Stability & Control or E_E 582 Cyber-Power Systems
- **Microelectronics**
  - E_E 571 – Advanced Wireless Integrated Circuits & Systems
  - E_E 596 – Advanced Analog Integrated Circuits
- **Electrophysics**
  - E_E 518 – Advanced Electromagnetic Theory I
  - E_E 571 – Advanced Wireless Integrated Circuits & Systems
- **Computer Engineering**
  - E_E 524 – Advanced Computer Architecture
  - E_E 586 – VLSI Systems Design
  - NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
- At least two additional courses from the below list of Advanced Courses beyond the courses from a student's chosen Focus Area (completed with a B- or better)
  - **Advanced Courses**
    - E_E 501 – Linear System Theory
    - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
    - E_E 507 – Random Processes in Engineering
    - E_E 518 – Advanced Electromagnetic Theory I
    - E_E 521 – Analysis of Power Systems
    - E_E 523 – Power Systems Stability & Control or E_E 582 – Cyber-Power Systems
    - E_E 524 – Advanced Computer Architecture
    - E_E 555 – Computer Communication Networks
    - E_E 571 – Advanced Wireless Integrated Circuits & Systems
    - E_E 582 – Advanced Topics: Cyber Security
    - E_E 586 – VLSI Systems Design
    - E_E 596 – Advanced Analog Integrated Circuits
    - CPT_S 516 – Algorithmics

Final Examination

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The final examination should be scheduled after the student has completed all required coursework and applied for the degree. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. In the case of the written exam detailed below, the scheduling form will denote a Ballot Meeting that the student does not need to attend. Note that the student must be enrolled in a minimum of two E_E 702 credits during the final exam semester.

The final exam consists of a portfolio of representational projects from the student's Master's course work, a resume/CV, a LinkedIn profile, and a brief response to an assigned paper. The committee will assign a research paper related to the student's Focus Area(s), together with a specific set of questions. The student will be asked to write a 5-page report (in scientific format) that addresses the questions and submit it to the committee before the date determined on the exam scheduling form. The committee will then grade the entire final exam submission to determine a Pass/Fail grade and forward the signed examination ballots to the Graduate School.

M.S. Software Engineering
Online Degree Only

Course Requirements

Students in the Online M.S. Software Engineering program must complete the following coursework for their Program of Study:

- **30 total credits – minimum**
  - **Core Courses** – 9 credits
    - CPT_S 484: Software Requirements
    - CPT_S 582: Software Testing
    - CPT_S 587: Software Design and Architecture
  - **Advanced Courses** – 13 credits
    - CPT_S 581: Software Maintenance
    - CPT_S 583: Software Quality
    - E_M 564: Project Management
    - CPT_S 702: Masters Special Problems, Directed Study and/or examination (4 credits)
  - **Elective Courses** – 9 credits taken from the courses listed below
    - CPT_S 415: Big Data
    - CPT_S 451: Introduction to Database Systems
      E_M 522: Leadership, Supervision and Management
    - any other 500-level course in Software Engineering, Computer Science, Computer Engineering, or Math
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

Final Examination

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

The Final Exam will be scheduled after the student has applied for the degree and has discussed with their committee. The Exam Scheduling form must be submitted to the Graduate Program Coordinator, a minimum of three weeks in advance of the final exam date. In the case of a written exam detailed below, the scheduling form will denote a Ballot meeting that the student does not need to attend. Note that the student needs to be enrolled in a minimum of 2 702 credits in the final semester for taking the final exam.

The Final Exam consists of a portfolio of representational projects from the student's Master's coursework, a resume/CV, a Linkedln profile, and a brief response to an assigned paper. The committee will assign a research paper related to the student's Focus area(s), together with specific set of questions. The student will also be asked to write and submit a 5- page report (in scientific format) that addresses the questions and submit it to the committee before the date determined on the exam scheduling form. The committee then grades the entire final exam submission to determine a Pass/Fail grades. The ballots are forwarded to the Graduate School for processing.

Doctoral Degree Requirements

Ph.D. Computer Science

Course Requirements

Students in the Ph.D. Computer Science program must complete the following coursework for their Program of Study:
- 72 total credits – minimum
  - 24 graded credits – minimum
    - 18 credits graduate-level (500-level), excluding 595 - minimum
    - 6 credits non-graduate (400-level) and/or 595 -- maximum
    - 12 transferred credits – maximum
  - 48 CPT_S 800 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental areas, each Ph.D. Electrical & Computer Engineering student must complete the following course requirements:
- Required courses
  - CPT_S 515 Advanced Algorithms or CPT_S 516 Algorithmics, must be passed with B or better.
  - 9 credits minimum covering at least three different areas listed below. All three courses must be passed with B or better.
    - **Artificial Intelligence and Machine Learning**
      - CPT_S 534 – Neural Network Design & Application
      - CPT_S 540 – Artificial Intelligence
      - CPT_S 570 – Machine Learning
      - CPT_S 577 – Structured Prediction
    - **Data Science**
      - CPT_S 415 – Big Data
      - CPT_S 571 – Computation Genomics
      - CPT_S 575 – Data Science
      - CPT_S 580 – Special topics on Data Science related topics
      - CPT_S 591 – Elements of Network Science
    - **Systems & Graphics**
      - CPT_S 411 – Introduction to Parallel Computing
      - CPT_S 483 – Special topics course (Intro to Compilers & LLVM)
      - CPT_S 527 – Computer Security
      - CPT_S 542 – Computer Graphics
      - CPT_S 561 – Computer Architecture
      - CPT_S 566 – Embedded Systems
      - CPT_S 580 – Advanced GPU Programming and other topics related to topics in computer systems
    - **Software Engineering**
      - CPT_S 484 – Software Requirements
      - CPT_S 543 – Human-Computer Interaction
      - CPT_S 580 – Special topics on Software Engineering topics
      - CPT_S 581 – Software Maintenance
      - CPT_S 582 – Software Testing
      - CPT_S 583 – Software Quality
      - CPT_S 587 – Software Design & Architecture

- The above core courses should be successfully completed within three semesters of admission to the program in order to properly prepare the student for the major area section of the Qualifying Exam (QE).

Qualifying Exam (QE)

The purpose of the Ph.D. Qualifying Exam (QE) is to assess the student's depth and breadth of knowledge as deemed to be suitable for the doctoral program. Passing the QE is required to achieve Advanced Graduate Standing (AGS), the status that permits students to pursue the Ph.D. degree.

The QE must be taken no later than the end of the student's third semester in the Ph.D. program. Exceptions to this policy, by the request of the student and their advisor, will be considered on a case-by-case basis by the GSC. The exam will be given once each regular semester, fall and spring. If any area committee chooses not to offer its exam during the spring semester, the student will be allowed to postpone their exam for one semester. Students must sign up for the exam no later than the second week of their third semester. Electrical & Computer Engineering students will specify their major and minor areas on the QE scheduling form (example in Appendix). Area committees should administer the examinations and report the results to the GSC before the end of the semester.

Upon successful completion of the QE, the GSC will consider students for AGS. Students may take the QE a second time if they do not pass the first attempt, unless otherwise specified by the examining committee. Any student that fails the QE a second time will be terminated from the Ph.D. program.

Breadth Requirement

A student must take at least twelve (12) graded credits of computer science courses (excluding CPT_S 500 and 595) at the 500- level. One of these courses must be CPT_S 515 or CPT_S 516 and the student must achieve grade point average of 3.70 for the fifteen credits. A course with a grade below B cannot be applied toward the breadth requirement. Up to six approved transfer credits may be used toward the total requirement.

A student who has not fulfilled this requirement at the end of two semesters of study must still take the written and oral portions of the QE during their third semester. A student who does not meet the breadth requirement by the end of their third semester may be dismissed as a Ph.D. student. The student's advisor may request an extension to the breadth requirement from the GSC.

Depth Requirement – Exam Structure

The written and oral QE is taken during the third semester following admission to the Ph.D. program and must be taken prior to the completion of twenty-one graded graduate credit hours in the Ph.D. Computer Science program at WSU. This examination is intended to ascertain the student's readiness to undertake research at the Ph.D. level. The student will be examined in an appropriate area chosen by the student with the assistance of their faculty advisor.

The written portion is a take-home exam give typically on a Friday and due to the committee chair the following Tuesday. On the subsequent Friday, the committee administers the oral portion of the exam. For the examination, the student is given a set or research questions and a set of related research papers. The student prepares a written report of ten to twenty pages based on the papers and questions. The oral exam consists of a presentation and defense by the student regarding the answers to the research questions. There will also be a question and answer period that will include general questions not directly related to the take-home questions.

If a student fails the exam, it may be retaken once during the following semester. The retake need not be in the same area as the failed examination, but only one retake is allowed.

Qualifier Expectations

Students should have done work equivalent to taking 500-level courses in the examination area. They must be able to read and comprehend the recent literature in that topic area and be able to critique and compare the motivations, methods, and results of the work. They must be able to find related material in the library and on the internet. They must be able to write a scholarly report on a collection of papers that includes reviews of the papers and conclusions produced by synthesizing information from multiple papers. They must be able to orally present their findings with supporting visual materials to the examination committee. They must be able to answer technical questions about the material they read and present.

Doctoral Students

Prior to Preliminary Exams:

Prior to taking preliminary exams, all doctoral students are required to enroll for a minimum of two credits every fall and spring semester until they complete all of their degree requirements. Graduate leave is available to those students who are in good standing, but must be away from campus for personal reasons. See Graduate School Policies & Procedures for more information regarding Graduate Leave, including Internship Leave: https://gradschool.wsu.edu/chapter-five-a6- 7/. Please note that international students must consult with International Programs regarding personal or internship leave and discuss the enrollment requirements with them.

If a doctoral student does not register for credit or go into approved Graduate or Internship Leave status, their absence is considered to be unapproved. Such students may reenroll and will need to pay a $25 reenrollment fee if they are absent for less than three semesters (excluding the summer). Reenrollment also requires departmental approval and is not guaranteed. Students who are absent for three consecutive semesters (excluding the summer) will be dropped from the Graduate School.

After Successful Completion of Preliminary Exams:

After successful completion of preliminary exams, doctoral students are expected to continue to enroll for research credits each semester until they defend their dissertation. There is a three-year deadline from the date of the preliminary exam to the date of degree completion. Students who have taken their preliminary exams, have met all of their program requirements except completion of their dissertation, and do not have the funding to register for two or more research credits will be placed into Continuous Doctoral Status (CDS) for a limited number of semesters. Students in CDS will be charged a $50 per semester administrative fee and will have limited access to University resources. See Graduate School Policies & Procedures for more information regarding CDS: https://gradschool.wsu.edu/chapter-five-a2/.

Grading

Each committee grades the exams in their area and reports the results to the all the Computer Science faculty. The examining committee consists of three people with one person designated as chair of the committee. The student's advisor will serve on the committee, but cannot be the chair. Each report includes a pass/fail recommendation and a summary of the student's performance on the exam. If no objections to the results are raised within 7 days, the committee's recommendation stands. Otherwise, the computer science faculty will meet to discuss the matter and decide by majority vote whether the student passes.

Advanced Graduate Standing (AGS)

Advanced Graduate Standing (AGS) is the departmental designation for official permission to pursue a Ph.D. degree. The Graduate Studies Committee (GSC) grants AGS status. The GSC considers a student for AGS after the dissemination of QE results and completion of required courses. The process of evaluation for AGS is based on:
- The student's performance on the QE in their declared Major Area
- Performance in graduate courses specifically in their Core Courses and declared Minor Area
- Letter of recommendation from the student's research advisor
- Other information pertinent to the pertinent to the student's ability to perform high-quality doctoral-level work

The GSC may:
- Grant AGS
- Grant AGS with specified conditions
- Grant continuation in the program with reevaluation by the GSC after specified conditions are satisfied
- Terminate the student from the Ph.D. program.

Preliminary Exam (PE)

A doctoral student is advanced to candidacy when they pass the Preliminary Examination (PE). The Program of Study must be approved by the graduate school before the student can take the PE. The PE should be held no later than the fifth semester of the student's Ph.D. program. If unsuccessful, a student may be allowed to take the examination one more time. The overall format for the PE is described in the Graduate School Policies & Procedures. The specific format of the EECS PE is described below:

> The student will submit an eight to twelve page (single-spaced) "Dissertation Proposal" to the GSC and their doctoral committee before scheduling the Ph.D. PE and after passing the Ph.D. QE. This document shall describe the student's intended Ph.D. research in reasonable detail – including introductory and background material, preliminary research conducted, plans for further research, and bibliography. The proposal may serve as the focus for the PE, although this is not required. There must be a minimum of six months between passing the PE and taking the final dissertation defense. The exam itself will consist of the presentation of the proposal by the student and questioning from the committee and permanent faculty in attendance. The vote on the PE will be held at the end of the exam.

The student must submit a scheduling form to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. The student must also submit a list of publications using the Publications form (example in Appendix) and is required to meet the EECS Publication Policy before the exam scheduling form is approved. Note that the student must be enrolled in a minimum of two CPT_S 800 credits during the preliminary exam semester.

Final Examination – Doctoral Defense

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission. Details of this are available at the graduate school website.

An oral final examination is given after the completion of the dissertation. This examination (open to the public) is primarily a defense of the dissertation. The final examination should be scheduled after the student has completed all required coursework, applied for the degree, and had their dissertation approved by their committee. A List of Publications should also be submitted to the GSC prior to scheduling of exam. The list should include all publications submitted, accepted, or in preparation as well as the full name of the conference or journal for which they were submitted and the (anticipated) date of submission or appearance. The student must also submit a list of publications using the Publications

form (example in Appendix) and is required to meet the EECS Publication Policy before the final exam scheduling form is approved. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three- weeks in advance of the examination date. Note that the student must be enrolled in a minimum of two CPT_S 800 credits during the final exam semester.

If the student's dissertation is approved and the oral defense is passed, the student must provide a digital copy of the dissertation to the School of EECS. Dissertations must be formatted in accordance with University and Graduate School requirements, and all changes suggested by the student's committee must be made in the final version. The results of the dissertation research should be submitted to a refereed journal.

Starting Fall 2023, students will need to follow the below process to submit their dissertation

(1) **Title/Abstract/Signature Pages:** Students will no longer upload these pages into myWSU following their final examination. Instead, students will complete the new *Thesis/Dissertation Approval Form* and upload this document into myWSU. This form will go to you for a candidate number, then to the committee chair. The chair will approve the thesis/dissertation on behalf of the entire committee. The service request will return to you for submission to the Graduate School. Committee members will no longer approve these uploads.

(2) **Final Thesis/Dissertation, Exam Ballots, and Final Documents Deadline:** The submission deadline for all of these items (including the revised thesis or dissertation in ProQuest, exam ballots, *Thesis/Dissertation Approval Form* submitted to the Graduate School as described above, *HHA Form*, *SED Completion Certificate*, and any necessary Copyright releases) is being extended from five business days to ten business days. Additionally, students are encouraged to upload their completed *HHA*, *SED Completion Certificate*, and copyright release documents into GRM.

Ph.D. Electrical & Computer Engineering

Course Requirements

Students in the Ph.D. Electrical & Computer Engineering program must complete the following coursework for their Program of Study:

- 72 total credits – minimum
  - o 24 graded credits – minimum
    - ▪ 18 credits graduate-level (500-level), excluding 595 – minimum
    - ▪ 6 credits non-graduate (400-level) and/or 595 -- maximum
    - ▪ 12 transferred credits – maximum
  - o 48 E_E 800 credits – minimum
- Any undergraduate coursework assigned to the student to make up for undergraduate deficiencies at the time of admission may not be used toward the student's degree.

In order to ensure that each student obtains a reasonable graduate-level understanding of a number of fundamental areas, each Ph.D. Electrical & Computer Engineering student must complete the following course requirements:

- Focus Areas
  - o **Computer Engineering**
    - ▪ **Core Courses**
      - Take at least two of the following courses; must be completed with a B or better
        - o E_E 524/CPT_S 561 – Advanced Computer Architecture
        - o E_E 586 – VLSI Systems Design
          - ▪ NOTE: If E_E 586 is not available, E_E 466 (VLSI Design) may be substituted
        - o E_E 587 - System on Chip Design and Test
          - ▪ NOTE: If E_E 587 is not available, E_E 434 (ASIC and Digital Systems Design) may be substituted
      - Take at least one additional course from the following list; must be completed with a B or better
        - o E_E 501 – Linear System Theory
        - o E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
        - o E_E 507 – Random Processes in Engineering
        - o E_E 518 – Advanced Electromagnetic Theory I
        - o E_E 521 – Analysis of Power Systems
        - o E_E 523 – Power Systems Stability & Control
        - o E_E 524/CPT_S 561 – Advanced Computer Architecture
        - o E_E 555 – Computer Communication Networks
        - o E_E 571 – Advanced Wireless Integrated Circuits & Systems
        - o E_E 582 – Advanced Topics: Cyber Security
        - o E_E 586 – VLSI Systems Design
        - o E_E 587 - System on Chip Design and Test
        - o E_E 596 – Advanced Analog Integrated Circuits
        - o CPT_S 516 – Algorithmics
  - o **Electrophysics**
    - ▪ **Core Courses**
      - Take at least two of the following courses; must be completed with a B or better
        - o E_E 518 – Advanced Electromagnetic Theory I
        - o E_E 535 – Numerical Solutions to EM Problems
        - o E_E 571 – Advanced Wireless Integrated Circuits & Systems

- Take at least two additional courses from the following list; must be completed with a B or better
  - E_E 501 – Linear System Theory
  - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
  - E_E 507 – Random Processes in Engineering
  - E_E 518 – Advanced Electromagnetic Theory I
  - E_E 521 – Analysis of Power Systems
  - E_E 523 – Power Systems Stability & Control
  - E_E 524/CPT_S 561 – Advanced Computer Architecture
  - E_E 535 – Numerical Solutions to EM Problems
  - E_E 555 – Computer Communication Networks
  - E_E 571 – Advanced Wireless Integrated Circuits & Systems
  - E_E 582 – Advanced Topics: Cyber Security
  - E_E 586 – VLSI Systems Design
  - E_E 587 – System on Chip Design and Test
  - E_E 596 – Advanced Analog Integrated Circuits
- Any further courses as determined by your committee chair/faculty

- **Microelectronics**
  - **Core Courses**
    - The following courses must be taken at WSU (cannot be transferred in) and must be completed with a B or better
      - E_E 571 – Advanced Wireless Integrated Circuits & Systems
      - E_E 596 – Advanced Analog Integrated Circuits
- **Power**
  - **Core Courses**
    - The following courses must be taken at WSU (cannot be transferred in) and must be completed with a B or better
      - E_E 521 – Analysis of Power Systems
      - E_E 523 – Power Systems Stability & Control OR E_E 582 Cyber- Power Systems
      - One additional 500-level course in the Power area
      - One additional core course from another focus area (not in Power)

  - **Systems**
  - **Core Courses**
    - **Any of the following two courses** must be taken at WSU (cannot be transferred in) and must be completed with a B or better
      - E_E 501 – Linear System Theory
      - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
      - E_E 507 – Random Processes in Engineering
- Students will need to select a Minor Area and complete suggested coursework with a B or better

  - **Minor Areas – two 500-level courses in a breadth area, must be completed with a B or better:**
    - **Power**
      - E_E 521
      - E_E 523
    - **Microelectronics**
      - E_E 571
      - E_E 576
    - **Electrophysics**
      - E_E 518

- o E_E 535
    - **Computer Engineering** (any two of the following)
        - o E_E 524/CPT_S 561
        - o E_E 586
        - o E_E 587
    - **Computer Science** (any two of the following)
        - o <mark>Any class listed in CS PhD</mark> course requirement list

- One additional 500-level course from the following list or the previous breadth areas, must be completed with B or better. This course cannot be used to fulfill a previously listed requirement
    - E_E 501 – Linear System Theory
    - E_E 503 – Structure, Dynamics, & Control of Large-Scale Networks
    - E_E 507 – Random Processes in Engineering
    - E_E 518 – Advanced Electromagnetic Theory I
    - E_E 521 – Analysis of Power Systems
    - E_E 523 – Power Systems Stability & Control
    - E_E 524/CPT_S 561 – Advanced Computer Architecture
    - E_E 555 – Computer Communication Networks
    - E_E 571 – Advanced Wireless Integrated Circuits & Systems
    - E_E 582 – Advanced Topics: Cyber Security
    - E_E 586 – VLSI Systems Design
    - E_E 587 - System on Chip Design and Test
    - E_E 596 – Advanced Analog Integrated Circuits
    - CPT_S 516 – Algorithmics
- One additional 500-level Systems course, must be completed with B or better.
- Two additional 3 credit courses, which may be any combination of 500-level, 400-level, or 595, must be completed with B or better.

Qualifying Exam (QE)

The purpose of the Ph.D. Qualifying Exam (QE) is to assess the student's depth and breadth of knowledge as deemed to be suitable for the doctoral program. Passing the QE is required to achieve Advanced Graduate Standing (AGS), the status that permits students to pursue the Ph.D. degree.

The QE must be taken no later than the end of the student's third semester in the Ph.D. program. Exceptions to this policy, by the request of the student and their advisor, will be considered on a case-by-case basis by the GSC. The exam will be given once each regular semester, fall and spring. If any area committee chooses not to offer its exam during the spring semester, the student will be allowed to postpone their exam for one semester. Students must sign up for the exam no later than the second week of their third semester. Electrical & Computer Engineering students will specify their major and minor areas (if required) on the QE scheduling form (example in Appendix). Area committees should administer the examinations and report the results to the GSC before the end of the semester.

Upon successful completion of the QE, the GSC will consider students for AGS. Students may take the QE a second time if they do not pass the first attempt, unless otherwise specified by the examining committee. Any student that fails the QE a second time will be terminated from the Ph.D. program.

Minor Area Requirements

The Minor Area (breadth) requirement for the ECE is only required in the Systems area.

Major Area Exam

The students in the Ph.D. ECE program are required to take one exam in their Major Area (depth). The examination is not, in principle, tied to any particular WSU course; however, it is expected to at the first-year graduate level in each area. Each area has specific guidelines regarding the nature and format of the exam as described below. The examining committee in each area will provide a written evaluation of the performance of each student to the GSC. The major advisor of a student taking that exam should not be part of that examining committee and (if a member of the GSC) will be excused from deliberations and voting. Students must perform satisfactorily in order to pass the QE.

Systems Area Qualifying Exams (QE)

The Systems Area QE will be a written exam lasting three hours, thirty minutes. This exam will consist of seven questions: two each from material covered in E_E 501 and 507, and one each from material covered in E_E 451, 464, and 489. Students are required to answer a total of five out of the seven questions. Four of the five required answers must be from the questions based on E_E 501 and 507. The other questions must be chosen from among the questions based on E_E 451, 464, and 489.

Materials:
- The exam will be closed book and closed notes
- Students may bring two 8.5" x 11" study sheets per course (both sides of the sheets may be used).
- At the beginning of the exam, students may read the problems from E_E 451, 464, and 489 before deciding which one to attempt and retain the two study sheets pertaining to that course.
- Scientific calculators with the following capabilities will be allowed: basic arithmetic operations, trigonometric, log and exponential, hyperbolic functions. In particular, calculators with significantly more capabilities than those listed, including graphing or programmability will not be allowed.
- Students will be allowed to bring in one handbook of mathematical tables (such as a CRC handbook). Printout of an electronic copy of mathematical tables can be substituted as long as the number of pages does not exceed 100 sheets (double-sided).

The Systems Area examinations committee will provide an assessment of each student's performance on the QE to the GSC within two weeks after the date of the exam.

The three possible performance assessments for students specializing in the Systems Area are:
1. Pass
2. Fail, but allowed to retake the exam the next time it is offered.
3. Fail and not allowed to continue in the Systems Area.

Each question on the QE will be worth twenty points. Students specializing in the Systems Area will automatically pass the exam if they score eighty or higher. Depending upon the particular exam, the examining committee may set the pass/fail threshold lower than eighty. Students who fail the exam on their first attempt but achieve a score within fifteen points of the pass/fail threshold will be assessed at performance level 2 above. Students who fail to achieve a score greater than or equal to fifteen points below the pass/fail threshold on their first attempt or who fail the exam on their second attempt may be assessed at performance level 3.

Power Area Qualifying Exams (QE)

The Power Area QE will consist of two parts: a written examination and an oral examination.

The student must get a pass grade in both the written and oral exams for completing the QE.
The written QE will be administered as an in-class closed book closed notes exam consisting of 7 questions and will last three hours. The student is allowed to bring a scientific calculator with complex and matrix arithmetic (with no preloaded programs) and four 8.5"X11" single sided formula sheets.

The syllabus for the written QE will be the material covered in the two undergraduate courses at WSU in the power area, namely, 1) EE361[i], and 2) EE491. There will be 3 questions from EE361 and four from EE491. The student is expected to answer any five questions of his/her choice, and each question will carry a weight of 20 points. If more than five questions are answered, the best 5 scores will be taken. Total score of 75 or above is required for a pass grade in the written QE.

The student is expected to take the written QE in the second semester of the PhD program, and the exam should be scheduled within the first eight weeks of the semester. Students who have an A or A- grades in both EE361 and EE491 at WSU will be waived from the written QE.

The oral QE should be scheduled for an hour and will consist of two parts. The first part will be a follow-up on the corrected solutions for the written QE problems. For the second part, the student will select a journal publication from any IEEE transactions (in consultation with his/her advisor) possibly related to the research topic of the student. The journal paper should not include any authors from WSU.

The student will make a seminar presentation on the paper for about 20 minutes and answer questions on related subjects. While the oral exam is open to all power area faculty, the PhD thesis committee is expected to participate in the oral QE. The faculty attending the oral QE will vote on the outcome, and a majority vote will determine the student grade for the oral exam. The student is expected to take the oral QE in the third semester of the PhD program.

In case of a fail grade in either the written or the oral QE, the student is allowed to retake the respective QE one more time. Second fail grade in the written or oral QE will lead to termination from the PhD program.

Specific topics in EE361 are included: Sections 1.8, 3.1 to 3.10, 5.3, 5.4, 5.5, 5.9,5.10, 6.2, 7.3, 7.4, and 7.5 and Chapters 2, 9 and 10 of the books titled "Electric Machinery and Power System Fundamentals", by S. J. Chapman, McGraw-Hill, 2001, ISBN 0072291354.

Microelectronics QE

Students declaring Microelectronics as their major field will complete a two-part evaluation.

The Microelectronics Area QE will have a written exam lasting three hours and thirty minutes. This exam will consist of eight questions: two each from material covered in E_E 596 and 571, and two each from material covered in E_E 476 and 431. Students are required to answer a total of five out of the eight questions. Four of the five required answers must be from the questions based on E_E 596 and 571. The other questions must be chosen from among the questions based on E_E 431 and 476. Each question on the QE will be worth twenty points. Students specializing in Microelectronics will automatically pass the exam if they score eighty(80) or higher.

For the oral exam, the examining committee will first select two relevant research papers from top-tier IEEE journals, from which the student will have two weeks to provide a two-page, single-spaced paper summarizing and interpreting the research in these papers. After the student has submitted this written report to the QE committee, there will be an oral exam scheduled, for which the student will present these results in a twenty to thirty-minute presentation. After the presentation, the committee will have an oral question and answer period to assess the student's knowledge of the fundamentals and the student's analytical abilities. The committee will vote on the outcome; a majority vote will determine the student's grade for the oral exam.

In case of a grade of Fail in either the written or the oral exams, the student is allowed to reattempt once. A second Fail grade in the QE will result in termination from the Ph.D. program. The Microelectronics examination committee will provide an assessment of each student's performance to the GSC within two weeks of the date of the exam.

Electrophysics QE

Ph.D. students with a major emphasis of Electrophysics must pass E_E 518 with a grade of B or better. Additionally, students must pass a written and oral examination that assesses a student's readiness to undertake research at the Ph.D. level.

The exam material consists of a set or research questions and a set of related research papers. This material is delivered to the student at the start of business on a Friday. The student prepares a written report of ten to twenty pages based on the material provided. The written report is submitted in electronic form to the chair of the examining committee by 11:59 p.m. the following Tuesday. On the subsequent Friday, the committee administers the oral portion of the exam. The oral exam is scheduled for two hours. The student prepares a presentation of approximately thirty minutes on their answers to the research questions. During the student's presentation, the committee primarily asks questions to probe the student's depth of understanding of the material directly related to the written examination.
However, students should also expect general questions pertinent to graduate study in Electrophysics.

A student will have passed the exam if at least two of the three members of the examining committee judge the student to have passed. Any faculty member may attend the oral exam and ask questions of the student, but only the examining committee members have a direct say in grading the student's performance.

At the request of the student's faculty advisor, a student that fails the exam may retake it the following semester. Students who fail the exam twice will be terminated from the Ph.D. program.

The examining committee consists of three people with one person designated as chair of the committee. The student's advisor will typically serve on the committee, but cannot be the chair.

It is the responsibility of the student's faculty advisor to provide material for the written exam, but the entire committee must approve the exam. The number of questions and the number of research papers is at the discretion of the committee.

Within two weeks of the completion of the written and oral exams, the chair of the examining committee will report the result to the GSC.

Computer Engineering QE

The Computer Engineering examination will be a written exam lasting two hours and will consist of six questions: two each from material covered in E_E 524 (CPT_S 561), E_E 586, and E_E 587. Students whose major area is Computer Engineering are required to answer a total of four out of the six questions.

The examination committee will provide an assessment of each student's performance on the QE to the GSC within two weeks of the date of the exam.

The three possible performance assessments for students specializing in Computer Engineering will be:
1. Pass
2. Fail, but allowed to retake the exam the next time it is offered.
3. Fail and not allowed to continue in Computer Engineering

Each question on the exam will be worth twenty-five points. Students specializing in Computer Engineering will automatically pass the exam if they score eighty or higher. Depending on the particular exam, the examining committee may set the pass/fail threshold lower than eighty.

Students who fail the exam on their first attempt but achieve a score within fifteen points of the pass/fail threshold will be assessed at performance level 2 above. Students who fail to achieve a score greater than or equal to fifteen points below the pass/fail threshold on their first attempt or who fail the exam on their second attempt may be assessed at performance level 3.

Advanced Graduate Standing (AGS)

Advanced Graduate Standing (AGS) is the departmental designation for official permission to pursue a Ph.D. degree. The Graduate Studies Committee (GSC) grants AGS status. The GSC considers a student for AGS after the dissemination of QE results and completion of required courses. The process of evaluation for AGS is based on:
- The student's performance on the QE in their declared Major Area
- Performance in graduate courses specifically in their Core Courses and declared Minor Area
- Letter of recommendation from the student's research advisor
- Other information pertinent to the pertinent to the student's ability to perform high-quality doctoral-level work

The GSC may:
- Grant AGS
- Grant AGS with specified conditions
- Grant continuation in the program with reevaluation by the GSC after specified conditions are satisfied
- Terminate the student from the Ph.D. program.

Preliminary Exam

A doctoral student is advanced to candidacy when they pass the Preliminary Examination (PE). The PE should be held no later than the fifth semester of the student's Ph.D. program. If unsuccessful, a student may be allowed to take the examination one more time. The overall format for the PE is described in the Graduate School Policies & Procedures. The specific format of the EECS PE is described below:

> The student will submit an eight to twelve page (single-spaced) "Dissertation Proposal" to the GSC and their doctoral committee before scheduling the Ph.D. PE and after passing the Ph.D. QE. This document shall describe the student's intended Ph.D. research in reasonable detail – including introductory and background material, preliminary research conducted, plans for further research, and bibliography. The proposal may serve as the focus for the PE, although this is not required. There must be a minimum of six months between passing the PE and taking the final dissertation defense. The exam itself will consist of the presentation of the proposal by the student and questioning from the committee and permanent faculty in attendance. The vote on the PE will be held at the end of the exam.

The student must submit a scheduling form to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date.

The student must also submit a list of publications using the Publications form (example in Appendix). The student must also submit a list of publications using the Publications form (example in Appendix) and is required to meet the EECS Publication Policy before the exam scheduling form is approved. Note that the student must be enrolled in a minimum of two E_E 800 credits during the preliminary exam semester.

Final Examination – Doctoral Defense

The student must file an Application for Degree form with the Graduate School on or before the deadline date specified by the Graduate School; this is an online process and submission.

An oral final examination is given after the completion of the dissertation. This examination (open to the public) is primarily a defense of the dissertation. The final examination should be scheduled after the student has completed all required coursework, applied for the degree, and had their dissertation approved by their committee.

A List of Publications should also be submitted to the GSC prior to scheduling of exam. The list should include all publications submitted, accepted, or in preparation as well as the full name of the conference or journal for which they were submitted and the (anticipated) date of submission or appearance. The student must also submit a list of publications using the Publications form (example in Appendix) and is required to meet the EECS Publication Policy before the final exam scheduling form is approved. The scheduling form must be submitted to the Graduate Program Coordinator a minimum of three weeks in advance of the examination date. Note that the student must be enrolled in a minimum of two E_E 800 credits during the final exam semester.

If the student's dissertation is approved and the oral defense is passed, the student must provide a digital copy of the dissertation to the School of EECS. Dissertations must be formatted in accordance with University and Graduate School requirements, and all changes suggested by the student's committee must be made in the final version. The results of the dissertation research should be submitted to a refereed journal.

Starting Fall, 2023, students will need to follow the below process to submit their dissertation:

(1) **Title/Abstract/Signature Pages:** Students will no longer upload these pages into myWSU following their final examination. Instead, students will complete the new *Thesis/Dissertation Approval Form* and upload this document into myWSU. This form will go to you for a candidate number, then to the committee chair. The chair will approve the thesis/dissertation on behalf of the entire committee. The service request will return to you for submission to the

Graduate School. Committee members will no longer approve these uploads.

(2) **Final Thesis/Dissertation, Exam Ballots, and Final Documents Deadline:** The submission deadline for all of these items (including the revised thesis or dissertation in ProQuest, exam ballots, *Thesis/Dissertation Approval Form* submitted to the Graduate School as described above, *HHA Form*, *SED Completion Certificate*, and any necessary Copyright releases) is being extended from five business days to ten business days. Additionally, students are encouraged to upload their completed *HHA*, *SED Completion Certificate*, and copyright release documents into GRM.

Graduate Assistantships

Overview

Research Assistantship (RA)

A Research Assistantship (RA) is a part-time professional appointment to assist a faculty member in a specific research project. The faculty specifies the work to be accomplished by the RA during the appointment. There is a wide latitude in the types of work an RA may do for the research effort, and the time spent in various aspects may vary widely. As a guide, a half time, .50 FTE, appointment should average twenty hours per week, with fractional appointments in proportion.

Teaching Assistantship (TA)

A Teaching Assistantship (TA) is a part-time professional appointment for a faculty instructor. A TA provides professional assistance as either a grader or laboratory assistant. The GSC and the Associate Director make the TA assignments.

The TA is expected to report to the School of EECS one week prior to the first day of classes; if they fail to do so, the student's assistantship will be revoked. The TA's responsibilities are not completed until final grades for the course have been assigned, unless excused earlier by their instructor.

Eligibility

Students enrolled in a Ph.D. or M.S. – Thesis program within the School of EECS are eligible for RA appointments. Only Ph.D. students are eligible for TA appointments. Those enrolled in the M.S. – Non-thesis programs are not eligible for any assistantship.

Incoming students and prospective students are automatically considered for assistantship positions at the time their application for admission is being evaluated. Assistantships will be awarded to incoming students based on the strength of their applications, faculty interest, and availability of funds. If an assistantship is not awarded for the first semester of graduate work, the student may request support for subsequent semesters. These funding decisions will be made by the student's faculty advisor.

TA Policies
Minimum Scores for Teaching Assistants
All continuing TA's funded by the WSU Pullman campus School of Electrical Engineering & Computer Science are expected to be Ph.D. students with a minimum cumulative GPA of 3.4 or higher at the time the position is assigned. Exceptions due to teaching load necessity must be approved by the Director or Associate Director, in writing. Newly admitted Ph.D. students will be subject to faculty request and must meet minimum 3.4 GPA in most recent relevant degree and 93 TOEFL (Departmental requirement) or 7 IELTS test scores

ITA exams are no longer required to be a Teaching Assistant, however if your advisor or the department recommends you to take the exam, you must contact the Graduate coordinator for determining an exam date.

All students on assistantship are required to take the Responsible Conduct of Research (RCR) training. The WSU RCR trainings offered by CITI are one important way to stay abreast of misconduct type issues, plus many other important research related topics (See ORSO Guideline 8). That training can be accessed in MyResearch.

120 Hour Support Limit

All TA's funded by the WSU Pullman campus School of Electrical Engineering & Computer Science are limited to 120 hours of TA support through the duration of their degree. Exceptions to this policy must be approved, in writing, by the Director or Associate Director during the semester the student reaches the 120-hour limit.

Expectations

Work Assignments & Course Loads

Students supported on an assistantship are expected to be available for performance of their duties beginning one week prior to the first day of classes through the date that grades are due at the end of the semester. Full assistantships, .50 FTE, require a work commitment of about twenty hours per week.

Graduate assistants must register for a minimum of ten credit hours, including graded coursework and research credits.

Grading Assistance

A TA assigned as a grader may be expected to review, critique, and grade problem sets, exercises, reports, examinations, and other written or oral material. A grader may also be expected to assist in preparing programs, problem sets, and contribute to examination sets.

Laboratory Assistance

The lab TA assists in the laboratory by interpreting the laboratory instructions, demonstrating proper use of equipment and supplies, answering students' questions, encouraging students to perform quality work and investigating odd or unexpected results. The TA may aid in preparing experiments and exams, performing demonstrations, preparing and grading reports and examinations.

Laboratory assistance may include helping students learn computer techniques.

Tuition Waivers

All graduate students admitted to the Pullman, Spokane, Tri-Cities, or Vancouver campuses who have been awarded a half time, .50 FTE, assistantship may qualify for waivers of the non-resident and/or resident tuition.

1. To qualify for a resident or non-resident tuition waiver, students must reside in the State of Washington.
2. For newly admitted students who are U.S. citizens or permanent residents, but who are not residents of Washington State, non-resident waivers are available, but cannot be guaranteed beyond one year. These students should contact the Graduate School for information regarding residency requirements and establishing residency.
3. To qualify for the non-resident or resident tuition waiver, appointments must be for the full semester, or the full academic year. If an appointment terminates during the semester, a graduate student may lose all waivers and be held responsible for paying their tuition.
4. Waivers do not cover mandatory graduate student fees. Graduate students on an assistantship will be responsible for paying the mandatory student fees each semester, as well as a small portion of the tuition that cannot, by law, be waived. For students on a half-time assistantship, with full waivers, the amount to be paid for the current semester can be found on the Graduate School website.
5. The Graduate School does not provide tuition waivers to offset tuition for students admitted to Global Campus (online) programs. Students wishing to participate in special scholar programs in which tuition waivers are granted by the Graduate School must be admitted to a Pullman, Spokane, Tri-Cities, or Vancouver-based program to be eligible for the tuition waiver.
6. The Graduate School does not provide tuition waivers during the summer; however, graduate students on assistantships during the summer session may qualify for a TA tuition waiver through the Summer Session Program or a qualified tuition reduction (QTR) through a non-state-funded assistantship appointment.

Required Training for Graduate Assistants

RCR Training

Mandatory training on the Responsible Conduct of Research is required of all graduate students, and it is a service requirement for graduate assistants.

This is a web-based training located at http://myresearch.wsu.edu. Students should take this training as soon as possible, and will need to retake it after a five-year period. Students are not eligible for an assistantship until their training is complete. A grace period of one semester will be granted for international students who have not taken the training at the start of their assistantship. If the assistantship for the subsequent semester is processed late due to the student not completing the training in a timely manner, the student will be responsible for paying all late fees applied to their account and may lose their eligibility for the assistantship.

ITA Exam – Not required as of this semester.

Assistantship Stipends

Stipends for any graduate assistantship appointments are flexible. An Assistantship Stipend Guide is available on the Graduate School website at https://gradschool.wsu.edu/assistantships/.
Graduate assistants who qualify also receive a health insurance benefit. Information about the health insurance can be found at http://studentinsurance.wsu.edu/graduate-assistants/.

For the 2023-20234school year, graduate students on assistantship with EECS will be paid according to the following:
- EECS M.S. students and Ph.D. students who have not passed the QE will be paid at salary step 53 (approximately $2183.50/month for a nine-month appointment).
- EECS Ph.D. students who have passed the QE will be paid at salary step 60 (approximately $2342.50/month).

Assistantship Renewal

Assistantships are assigned on a per-semester basis and students must apply with their faculty advisor to renew their assistantship each semester. Assistantship renewal is contingent on available funding as well as meeting the minimum conditions for reappointment, listed below.

Minimum Conditions for Reappointment
The department has established the following criteria as the minimum standard for reappointment:
- Satisfactory progress in research, as determined by research advisor.
- Satisfactory progress in coursework as determined by the student's advisory committee and/or the Graduate Program Coordinator.
- *Teaching Assistants Only*
  - A minimum cumulative GPA of 3.4 must be maintained in order to be appointed as a TA.
  - Passage of TA oral English exam, ITA. (Advisor & Department decision)
  - Satisfactory performance as a TA, as determined by faculty supervisor and student assessments of TA performance, if available.

Termination of Assistantship

The department has determined the following criteria as reasonable grounds for termination of assistantship:
- Unsatisfactory performance of duties as a teaching or research assistant.
- A semester GPA below 3.00 at any time, or a semester GPA between 2.5 and 3.0 for more than one semester.
- Failure to file a Program of Study by required date.
- Violation of academic integrity policy.

Changing Assistantship Type and/or Changing Faculty Advisors

Students can switch from a TA position to an RA position if they find a suitable research project and arrangements are made with the principal investigator in charge of that research project. The process to change assistantship type is:
- The PI/faculty advisor must write a memo of support to the Graduate Program Coordinator, agreeing to support the student and detailing their support of the student's capabilities to perform as an RA or TA.
- The GSC will review the memo and approve or deny the request.
- All requests to change assistantship type must be made prior to the appointment period of the subsequent term.

Publication Policy

PhD and MS Thesis students:

- Before taking the preliminary exam, each PhD student must have at least one top-tier paper (see list link below) accepted. This information should be submitted with the PhD preliminary exam scheduling form to Graduate Program Coordinator for enforcing this policy. Each PhD student by the PhD defense date must have at least two top-tier papers published/accepted, preferably as a first-author. For ECE PhD students at least one of the publications must be a journal paper. The list of top-tier publication venues (combination of conference and journals) is available at link below. This information should be submitted with the PhD defense scheduling form to the Graduate Coordinator for enforcing this policy.

- For MS thesis students, we encourage submission of one paper by the time of thesis defense, but it is not mandatory.

-
    - **ECE PhD Student Publication Requirement List –**

        https://school.eecs.wsu.edu/phd-student-publication-requirement-list/

    - **CS-Publication Venue –**

        https://school.eecs.wsu.edu/cs-publication-venue/

Graduate School Requirements, Policies, and Procedures

In addition to EECS policies, students are expected to abide by the Graduate School requirements, policies, and procedures as outlined in the Graduate School Policies & Procedures Manual, found here:

https://gradschool.wsu.edu/policies-procedures/.

Appendix

This appendix includes helpful links and examples of departmental forms.

Helpful Links:

- Academic Calendar - https://registrar.wsu.edu/academic-calendar/
- Bursar's Office - https://bursar.wsu.edu/
- Costs - https://gradschool.wsu.edu/student-finance-page/
- Cougar Health Services - https://cougarhealth.wsu.edu/
  - Cougar Health Services, Counseling and Psychological Services (CAPS) Call 509-335-4511 during business hours, or 509-335-2159 after hours.
  - Student Care Network
- Deadlines and Procedures
  - Deadlines and Procedures for Master's Degree
  - Deadlines and Procedures for Doctoral Degree
- Discrimination, Sexual Harassment, & Sexual Misconduct Prevention Training - http://hrs.wsu.edu/dshp/
- Final Semester Grad School Info - https://gradschool.wsu.edu/graduating-this-semester/
- Graduate School Forms (all) - https://gradschool.wsu.edu/facultystaff-resources/18-2/
- Human Resource Services - https://hrs.wsu.edu/
- Insurance
  - International Students - https://cougarhealth.wsu.edu/studentinsurance/international-students/
  - Graduate Student Assistants - https://cougarhealth.wsu.edu/studentinsurance/graduate-students/
- International Programs - https://ip.wsu.edu/on-campus/about-us/
- ITA Evaluation - https://ip.wsu.edu/learn-english/teaching-assistant-evaluations/
- Jobs & Funding - https://gradschool.wsu.edu/scholarships-fellowships-awards/
- Payroll - https://payroll.wsu.edu/
- Professional Development Initiative - https://gradschool.wsu.edu/pdi/
- Publication Policy - https://school.eecs.wsu.edu/academics/graduate-program/publication-policy/
- Pullman Campus Map - https://map.wsu.edu/
- Registrar - https://registrar.wsu.edu/
  - Forms, Requests, and Information - https://registrar.wsu.edu/forms-and-requests/
- Residency - https://gradschool.wsu.edu/establishing-residency/
- Schedules of Classes Homepage - https://schedules.wsu.edu/
- Student Resources for all WSU Campuses - https://gradschool.wsu.edu/graduate-student-resources/
- VCEA Student Resources - https://vcea.wsu.edu/student-resources/

Declaration of Core Courses, Major, & Minor

To be submitted to the Graduate Program Coordinator with the official Program of Study request form.

School of
Electrical Engineering and Computer Science
VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

EECS Graduate Program: Core Courses, Focus Area, & Minor

Please declare your Core Courses used toward your degree below;
- The core courses declared by the student on the Ph.D. Program of Study must be passed with a B grade or better
- The core courses declared by the student on the M.S. Program of Study must be passed with a B- grade or better.
- Refer to the EECS Graduate Student Handbook for guidelines on the appropriate selection of core courses

Name: _____ ID: _____

M.S./Ph.D.: _____ Program: _____

Advisor/Committee Chair: _____

Focus Area(s): _____ _____

Minor Area (Ph.D. only): _____

Student Signature: _____

Advisor Signature: _____

Sample Form

PO Box 642752, Pullman, WA 99164-2752
509-335-6602 | Fax: 509-335-3818 | www.eecs.wsu.edu

Directed Study Form
Must be submitted to the Graduate Program Coordinator before the end of the first week of the semester in which you wish to take Directed Study

---

WASHINGTON STATE UNIVERSITY

School of
Electrical Engineering and Computer Science
VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

EECS Graduate Program: Directed Study (E_E/CPT_S 595) Enrollment Form

Policies:
- Instructing faculty and student must provide an abstract of the planned work and submit this signed form to the Graduate Coordinator by the end of the second week of the semester.
- A report describing the work must be submitted at the end of the semester. If a conference or journal paper or Tech Report is generated, a separate report is not necessary. The report and grade must be submitted to the Graduate Coordinator prior to the grade submission deadline. An "X" grade will be submitted if the grade and report are not submitted by the grading deadline.

Name: _____ ID: _____

E_E or CPT_S _____ Semester: _____ # of Credits (1-3) _____

Faculty Instructor Name: _____

Abstract:

Student Signature: _____

Advisor Signature: _____

PO Box 642752, Pullman, WA 99164-2752
509-335-6602 | Fax: 509-335-3818 | www.eecs.wsu.edu

Computer Science QE Scheduling Form

Must be submitted during the beginning of a Computer Science Ph.D. student's third semester; deadline will be clarified by the Graduate Program Coordinator.

Computer Science

Fall 2018 Qualifying Exam Scheduling Form

Submit Form

Please fill out the below student information and click "Submit Form". Only submit this form electronically, do not print it out. Thank you!

Student Information:

Name:

Student ID:

Advisor:

Starting Semester:

Minor Area – Breadth:

A student must take at least fifteen graded credits of computer science courses (excluding CPT_S 500 and 595) at the 500-level. One of these courses must be CPT_S 515 and the student must achieve grade point average of 3.70 for the fifteen credits. A course with a grade below B cannot be applied toward the breadth requirement. Up to six approved transfer credits may be used toward the total requirement.

Course	Credits	Semester Taken	Grade
			Select Grade
			Select Grade
			Select Grade
			Select Grade
			Select Grade

Examination Information (for Grad Coordinator use):

Committee Chair:

Committee Member:

Committee Member:

Written Exam Date:

Oral Exam Date:

Results:

AGS:

Letter:

Electrical & Computer Engineering QE Scheduling Form

Must be submitted during the beginning of a Computer Science Ph.D. student's third semester; deadline will be clarified by the Graduate Program Coordinator.

Electrical & Computer Engineering

Fall 2018 Qualifying Exam Scheduling Form

Submit Form

Please fill out the below student information and click "Submit Form". Only submit this form electronically, do not print it out. Thank you!

Student Information:

Name:

Student ID:

Advisor:

Starting Semester:

Major Area - Depth: Choose Major

Minor Area – Breadth: Choose Minor

Course: _____ Semester Taken: _____ Grade: Select Grade

Course: _____ Semester Taken: _____ Grade: Select Grade

Examination Information (for Grad Coordinator use):

Committee Chair: _____

Written Exam Date: _____

Results: _____

AGS: _____

Letter: _____

Sample Form

Cover sheet for a transfer request, only one form needs to be submitted for a batch of requests.

WASHINGTON STATE UNIVERSITY

School of
Electrical Engineering and Computer Science
VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

EECS Graduate Program: Petition to Transfer Course Work

Procedure:
- Graduate students must complete the request to transfer credits from other institutions during their first year in an EECS graduate program. In order to complete a petition to transfer coursework, students must:
- Complete a Petition to Transfer Graduate Coursework (this form) which will serve as an agreement between the department and the student regarding transfer policies and as a summary of all coursework requesting transfer.
- Complete a Course Request form for each course to be evaluated for transfer.
  - Attach supporting materials for each course to the Course Request form including syllabus, transcripts, course materials, etc.
  - NOTE: A rationale for inclusion on the program of study and a suggestion of a faculty reviewer must be provided for all courses by the advisor.
- Provide a draft of your program of study. (NOTE: You cannot request transfer of core courses.)

Transfer policy states that:
- You must have earned a grade of B or higher at an accredited institution.
  - If earned while working toward a master's degree, you may apply the credit toward your PhD.
  - If earned toward a completed master's degree, you may not apply toward another master's degree.
- You may only transfer courses that have a direct equivalency at WSU. (Maximum 6 credits each EE 581/2.)
- No more than 17 credits, or 5 courses, may be used toward a PhD (as of Fall 2021).
- No more than 6 credits, or 2 courses, may be used toward a master's.
  - PhD students may only request 5 courses to be reviewed and approved at a time, 2 courses for a master's.
  - If a request is denied, then the student may submit another request until they have had the maximum number courses approved.
- At the time of graduation, your coursework can only be 10 years old for PhD and 6 years old for a master's.

Name: _____ ID: _____

Advisor: _____ Degree: _____

Course at External Institution	Course at WSU	Date of Completion

Student Signature: _____

Advisor Signature: _____

Petition to Transfer Graduate Coursework: Transfer Course Request Form

One copy is required for each course request, attach to course syllabus.

EECS Graduate Program: Transfer Course Request

For Completion by Student:

Name: _____ ID #: _____

Requested Course:

Institution:	
Course Subject/Number:	
Course Title:	
Number of Credits:	
Grade:	
Date of Completion:	

WSU Equivalency:

Course Subject/Number:	
Course Title:	
Number of Credits:	
Current Instructor:	

For Completion by Advisor:

    Rationale for Transfer:

    Suggested Faculty Reviewer: _____

For Completion by GSC:

    Assigned Faculty Member for Review: _____

For Completion by Faculty Reviewer:

    Please select one:

        ⬤ I approve the transfer of this course as requested.

        ⬤ I approve the transfer of this course for a decreased number of credits: _____ Credits.

        ⬤ I approve the transfer of this course as a different graduate-level course than requested.I

        ⬤ deny the request to transfer this course.

    Comments:

    Reviewer Signature: _____

Petition to Transfer Graduate Coursework: Program of Study Draft

Students must submit a program of study draft with transfer requests; only one required per batch of requests.

EECS Graduate Program: Petition Program of Study DRAFT

For transfer course request use only.
This does not count as your official program of study for submission to the Graduate School.

Please work with your advisor and use the EECS Graduate Student Handbook to make sure you meet the program of study requirements for your degree.

Student Name:_____Student ID:_____

Advisor:_____ Degree:_____

Graded Coursework:

Course Prefix and Number	Course Title	Credits	Grade	Sem/Year Taken	WSU Instructor or Name of Institution for Transfers

Graded Coursework Total: 0_____

Non-Graded Coursework:

_____

Research Credits:

_____

Non-Graded Coursework Total: _____

Research Credits Total: _____

Total Credit Hours: 0_____

Publication List form

A list of publications is required with your submission of a Ph.D. preliminary exam scheduling form or Ph.D. doctoral defense scheduling form.

WASHINGTON STATE UNIVERSITY

School of
Electrical Engineering and Computer Science
VOILAND COLLEGE OF ENGINEERING AND ARCHITECTURE

EECS Graduate Program: Publication List

Please list your publications/conferences below (attach an additional page if needed). This list will be reviewed by the EECS Graduate Studies Committee for approval for your exam.

Name: _____ ID: _____

Degree: _____

Advisor/Committee Chair: _____

Preliminary Exam: ____ Doctoral Defense: ____ Intended Exam Date: _____

Publications:

Sample Form