

# DOCTOR OF PHILOSOPHY IN THE FIELD OF COMPUTER SCIENCE

Doctor of philosophy (PhD) students in the computer science program choose from among numerous focus areas, including: algorithms and theory; computer architecture, networks, parallel and distributed computing; computer security and information assurance; database and information retrieval systems; machine intelligence and cognition; multimedia, animation, graphics and user interface; and software engineering and systems.

Students in the doctoral program conduct cutting-edge research with world-class faculty, have access to collaborative opportunities unique to the Washington, DC, area, and benefit from the superb cultural and intellectual experiences the campus and program provide.

Visit the department website (<https://www.cs.seas.gwu.edu/phd-computer-science/>) for more information.

## ADMISSIONS

Admission deadlines: Fall – January 15

Spring – September 1

Summer\* – March 1 (non-F1 visa seeking applicants)

Standardized test scores: The Graduate Record Examination (GRE) is required for all applicants (Institution code 5246).

The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor's, master's, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction. Minimum scores:

- Academic IELTS: an overall band score of 6.0 with no individual score below 5.0; applicants requesting funding consideration must have an overall band score of 7.0 with no individual score below 6.0; or

- TOEFL: 550 on paper-based or 80 on Internet-based; applicants requesting funding consideration must have 600 on paper-based; or 100 on Internet-based; or

- PTE Academic: 53; applicants requesting funding consideration must have 68.

Recommendations: (3) recommendations required. If possible, one recommendation should be from your advisor at the institution from which you earned your highest degree.

Prior academic records: Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission.

If academic records are in a language other than English, a copy in the original language and an English language translation must be uploaded. Transcript evaluations should not be uploaded. Applicants who have earned a degree from an Indian university are required to submit individual semester marksheets.

Statement of purpose: Please write a comprehensive essay of 400 to 600 words, indicating your primary and supporting fields of study, your specialized interests, and the general subject area of your planned dissertation or professional project.

Additional requirements: Applicants without a master's degree must have a bachelor's degree with a GPA of at least 3.3 on a 4.0 scale; two math courses beyond pre-calculus; a strong academic background that includes courses in structured programming language, discrete structures, and data structures.

Applicants with a master's degree in a computer related field must have a GPA of 3.5 on a 4.0 scale; master's courses in advanced software paradigms, computer architectures, and design and analysis of algorithms.

All applicants should choose an area of focus that most closely matches their interests and note this on the online application. All applicants must submit a resumé or CV. Applicants to the doctoral program should identify one to three faculty members whose research interests most closely match their own and note this on the online application.

International applicants only: Please follow this link - <https://graduate.admissions.gwu.edu/international-student-application-requirements> (<https://graduate.admissions.gwu.edu/international-student-application-requirements/>) - to review the International Applicant Information carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW, and English language requirements.

\* A limited number of doctoral applicants are accepted for the summer. Please contact the admissions office for details. International applicants who require a visa from GW are eligible to apply for admission in fall and spring only (not summer).

For additional information about the admissions process visit the SEAS Admissions Frequently Asked Questions (<https://>

graduate.engineering.gwu.edu/admissions-frequently-asked-questions/) page.

Contact for questions:

engineering@gwu.edu

202-994-1802 (phone)

202-994-1651 (fax)

Hours: 9:00 am to 5:00 pm, Monday through Friday

## REQUIREMENTS

The following requirements must be fulfilled:

The general requirements stated under School of Engineering, Doctoral Program Regulations ([https://bulletin.gwu.edu/engineering-applied-science/#Doctor\\_of\\_Philosophy](https://bulletin.gwu.edu/engineering-applied-science/#Doctor_of_Philosophy)).

Students with a master of science degree—A minimum of 30 credits, at least 18 of which must be in courses taken for graduate credit and at least 12 credits in dissertation research. Courses must be approved by the student's advisor.

Students with a bachelor of science degree—A minimum of 54 credits, at least 18 of which must be in courses taken for graduate credit, and at least 12 credits in be dissertation research. No specific courses are required; the student and their advisor design the curriculum to meet the student's needs and goals. In some cases, particularly when the student undertakes a doctoral program in a field other than that in which the earlier degree was earned, the student's program of study will exceed the minimum number of required credits.

### Preliminary Examination

Failure of full-time students to pass the preliminary examination by the end of the fourth semester will lead to dismissal from the program.

Students who register for 6 credits or fewer in three consecutive semesters are part-time. Part-time students are required to pass the preliminary examination within their first three years, or 30 credits, of enrollment in the PhD program. Failure to do so will result in dismissal from the program.

To demonstrate competency, students take one course in each of the following areas:

- Algorithms and theory: CSCI 6212 Design and Analysis of Algorithms or CSCI 6311 Theory of Computation
- Software and systems: CSCI 6221 Advanced Software Paradigms, or CSCI 6431 Computer Networks, or CSCI 6461 Computer System Architecture

Competency is demonstrated in one of two ways:

- By completing the course with a minimum grade of A-; or,
- By taking only the written, in-class examinations in the course. With this option, students must pass all exams given during a semester, earning a minimum grade of A- in each.

Students who prove, via their official transcript, that they earned the requisite grades as part of their master's degree may apply that result to the preliminary exam requirement.

Students must submit a Preliminary Examination Form (<https://www.cs.seas.gwu.edu/forms/>) to the Department of Computer Science after completing the requirements for the preliminary exam.

### Publication Requirements

Students must have at least one peer-reviewed conference or journal paper accepted for publication at the time of the dissertation defense.

As a guideline, students are expected to have at least two or three conference or journal papers accepted for publication by the time of their dissertation defense, and the material from those papers should be the core of the dissertation.

### Dissertation

Forming a dissertation committee

- The dissertation committee must consist of at least three members, including the major advisor. Additional advisor(s) and co-advisors are optional and additional to the three members.
- The committee must have a presiding chair who is a regular full-time faculty member whose primary appointment is in the Department of Computer Science. The committee chair may not be the student's research advisor or co-advisor.
- At least two members of the committee, not including advisors and co-advisors, must be regular full-time faculty members whose primary appointment is in the Department of Computer Science.
  - Faculty with secondary appointments in the Department of Computer Science are not considered regular full-time faculty members in the Department.
- At least one member of the committee must be an external reviewer. The external reviewer must hold a doctoral degree. They may not be a research advisor or co-advisor of the student. They should have a primary appointment in another GW department or outside the University.
- The dissertation committee must be approved by the Chair of the Department of Computer Science.
- The committee membership is normally the same for the dissertation proposal examination and the dissertation defense. However, the membership may change with the approval of the advisor and department chair.

Dissertation proposal defense

- The defense may not take place before the student has passed the preliminary examination.

- The student’s advisor must approve the scheduling of the dissertation proposal defense.
- The student submits a written proposal, in the style of a dissertation, to the members of the dissertation committee. The proposal should contain preliminary results.
- The dissertation committee evaluates the proposal and conduct an oral examination of the student. The committee conveys its recommendation of pass/fail to the Department of Computer Science.

#### Dissertation defense

- The dissertation defense may not be scheduled before the student has passed the dissertation proposal defense.
- The student’s advisor must approve the scheduling of the dissertation defense.
- The student submits a written dissertation to the members of the dissertation committee, normally two or more weeks in advance of the defense. The writing should follow the dissertation writing guidelines ([https://graduate.seas.gwu.edu/sites/g/files/zaxdzs1526/f/downloads/Doctoral\\_Handbook\\_2017-2018.pdf](https://graduate.seas.gwu.edu/sites/g/files/zaxdzs1526/f/downloads/Doctoral_Handbook_2017-2018.pdf)).
- The committee evaluates the dissertation and conducts an oral examination of the student. The committee conveys its recommendation to pass or fail to the Department of Computer Science.

#### **Colloquium Expectation**

All full-time PhD students are expected to regularly attend department colloquiums.

#### **Graduation and Scholarship Requirements**

Students are responsible for knowing the University’s graduation and scholarships requirements. Consult the University Regulations (<https://bulletin.gwu.edu/university-regulations/#GGraduation>) section of this Bulletin. Students should consult the department for additional information and requirements.