MASTER OF SCIENCE IN THE FIELD OF COMPUTER ENGINEERING

Students in the computer engineering master’s program learn sophisticated computer architecture and integrated circuit design techniques using industry-standard computer-aided design tools. The master’s program offers a flexible schedule that includes late afternoon and evening classes as well as the ability to choose a thesis or non-thesis degree option.

Students acquire up-to-date knowledge and skills in the advances of computer systems architecture and networking, and in the rapidly growing use of superscalar microprocessors, real-time embedded systems, VLSI and ASIC design modules, digital signal processors and networked computing platforms.

More information is available on the departmental website (https://www.ece.seas.gwu.edu/master-science-computer-engineering/).

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 of all applicants. (Institution code 5246). Average scores for our Fall 2014 incoming class were: 161 (Q), 148 (V), and 3 (W).

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: Two (2) 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.

Statement of purpose: In an essay of 250 to 500 words, state your purpose in undertaking graduate study at The George Washington University; describe your academic objectives, research interests, and career plans; and discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned.

Additional requirements: Applicant must possess a B.S. in biomedical engineering, electrical engineering, computer engineering, or computer science with a grade point average of at least 3.0 (on a scale of 4.0) for the last 60 credits of undergraduate work. Students with a B.S. in another field may be admitted with a set of deficiency courses to be determined by the department.

International applicants only: All applicants must 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.

For more information on the admission process, please visit the SEAS Frequently Asked Questions page. (http://graduate.seas.gwu.edu/apply/faq/)

Contact for questions:
REQUIREMENTS

The following requirements must be fulfilled:

30 credits are required for the degree. Non-thesis and thesis options are available. For the thesis option, 6 of these credits are taken in ECE 6998 and ECE 6999. For either option, the student must select one focus area from the chart below and complete the specified number of credits for that area.

Colloquium requirement: In addition to required coursework, students must attend five non-credit bearing colloquia as part of their program of study. Each colloquium attended is verified by a faculty member also in attendance. After attending five colloquia, the student must submit to the department prior to applying for graduation a colloquium attendance form signed by the faculty advisor.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td><strong>Computer architecture and high-performance computing</strong></td>
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<td></td>
<td>Required</td>
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<tr>
<td>ECE 6005</td>
<td>Computer Architecture and Design</td>
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<td>At least five courses selected from the following:</td>
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<tr>
<td>ECE 6105</td>
<td>Introduction to High-Performance Computing</td>
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<td>ECE 6120</td>
<td>Advanced Microarchitecture</td>
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<td>ECE 6125</td>
<td>Parallel Computer Architecture</td>
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<td>ECE 6130</td>
<td>Big Data and Cloud Computing</td>
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<td>ECE 6140</td>
<td>Embedded Systems</td>
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<td>ECE 6150</td>
<td>Design of Interconnection Networks for Parallel Computer Architectures</td>
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<td>ECE 6160</td>
<td>Secure Computer Architecture</td>
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<tr>
<td>ECE 8150</td>
<td>Advanced Topics in Computer Architecture</td>
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<td>For thesis option</td>
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<tr>
<td>ECE 6998</td>
<td>Thesis Research I</td>
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<tr>
<td>ECE 6999</td>
<td>Thesis Research II</td>
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<td><strong>Electives</strong></td>
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<td></td>
<td>Non-thesis option—12 credits in elective courses; thesis option—6 credits in elective courses. For either option, at least 3 credits must come from outside of the area of focus list.</td>
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**MEMS, electronics, and photonics focus area**

Required

ECE 6030  Device Electronics

Four courses selected from the following:

ECE 6210  Machine Intelligence

ECE 6213  Design of VLSI Circuits

ECE 6214  High-Level VLSI Design Methodology

ECE 6215  Introduction to MEMS

ECE 6216  RF/VLSI Circuit Design

ECE 6218  Advanced Analog VLSI Circuit Design

ECE 6221  Introduction to Physical Electronics

ECE 6240  VLSI Design and Simulation

ECE 6245  Microfabrication and Nanofabrication Technology

ECE 6250  ASIC Design and Testing of VLSI Circuits

ECE 6255  Sensors, Networks, and Applications

ECE 6260  Introduction to Nanoelectronics

ECE 6761  Light and Information

ECE 6765  Photonics and Fiber Optics

For thesis option

ECE 6998  Thesis Research I

ECE 6999  Thesis Research II

Electives*

Non-thesis option—15 credits in elective courses; thesis option—9 credits in elective courses. For either option, at least 3 credits must come from outside of the area of focus list.

*Normally, no more than two courses taken outside the Department of Electrical and Computer Engineering may be counted toward the requirements for the degree. Courses taken outside the department must have prior approval from the student's faculty advisor. In addition, no more than three 3000- or 4000-level ECE courses that have been approved for
graduate credit may be counted toward the requirements for the degree.

**Educational Planner**

In consultation with an academic advisor, each student must develop an Educational Planner through DegreeMAP that governs the student’s plan of study. The Educational Planner should be established soon after matriculation and must be completed before the end of the student’s first semester. The Educational Planner must be approved by the advisor.

Visit the program website (https://www.ece.seas.gwu.edu/graduate-programs/) for additional information.