GRADUATE CERTIFICATE IN HIGH-PERFORMANCE COMPUTING

The graduate certificate in the field of high-performance computing (HPC) program provides a mechanism for practicing interdisciplinary computational engineers and scientists to acquire up-to-date knowledge in the advances of computer systems, in particular, the rapidly growing use of multicore processors, parallel computers, hardware accelerators, and networked computing platforms in applications. The program is tailored to provide students with necessary knowledge in all aspects of high performance computing including programming, applications, performance, architectures, and systems.

The certificate program may serve as an alternative to a Master of Science degree program for professionals who may not have the time to commit to a full graduate degree program, but who wish to align their background with the rapid changes in computing technologies and to expand their education beyond the bachelor's degree. All courses taken as part of this program may be transferred to the Department of Electrical and Computer Engineering's MS and/or PhD programs. While the HPC certificate can be coupled with a graduate degree program, interested students must be admitted to and complete the HPC certificate program separately.

Specific admission requirements are shown on the Graduate Program Finder (http://www.gwu.edu/all-graduate-programs).

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

REQUIREMENTS

The following requirements must be fulfilled: 12 credits, including 6 credits in required courses and 6 credits in elective courses.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td><strong>Required</strong></td>
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<tr>
<td>ECE 6105</td>
<td>Introduction to High-Performance Computing</td>
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<td>At least one of the following:</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><strong>Electives</strong></td>
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<td>Six additional credits from the following:</td>
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<td>CE 6210</td>
<td>Introduction to Finite Element Analysis</td>
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CE 6705  Nonlinear Finite Element Modeling and Simulation
CE 8330  Advanced Finite Element Analysis
CSCI 3571 Introduction to Bioinformatics
CSCI 4572 Computational Biology
CSCI 6421 Distributed and Cluster Computing
ECE 6005  Computer Architecture and Design
ECE 6045  Special Topics
ECE 6050  Research
ECE 6120  Advanced Microarchitecture
ECE 6140  Embedded Systems
ECE 6213  Design of VLSI Circuits
ECE 6214  High-Level VLSI Design Methodology
ECE 6735  Numerical Electromagnetics
ECE 6800  Computational Techniques in Electrical Engineering
MAE 6225  Computational Fluid Dynamics
MAE 6291  Special Topics in Mechanical Engineering
PHYS 6130  Computational Physics I
PHYS 6230  Computational Physics II
PHYS 6330  Computational Physics III
PHYS 8110  Selected Topics in Theoretical Nuclear Physics