SOFTWARE ENGINEERING GRADUATE CERTIFICATE

Banner Code: EC-CERG-SWE

Academic Advising
Phone: 703-993-1530
Email: csgrad@gmu.edu
Website: cs.gmu.edu/prospective-students/ms-programs/graduate-certificates/

This graduate certificate program provides knowledge, tools, and techniques to those who are working in or planning to work in software engineering, but do not want to complete requirements for a master’s degree in the field. The certificate may be pursued concurrently with any of the graduate degree programs in the College of Engineering and Computing (http://catalog.gmu.edu/colleges-schools/engineering-computing/).

The graduate certificate may be pursued on a part-time or full-time basis.

Admissions & Policies

Admissions

General Concentration

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the Computer Science Department (https://cs.gmu.edu/). This form provides summary information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to the following undergraduate courses: structured programming in a modern programming language, data structures, discrete mathematics, and machine organization. The level of knowledge may also be achieved by taking the following foundation courses at Mason:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFS 501</td>
<td>Discrete and Logical Structures for Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>SWE 510</td>
<td>Object-Oriented Programming in Java</td>
<td>3</td>
</tr>
<tr>
<td>INFS 515</td>
<td>Computer Organization Course and Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>INFS 519</td>
<td>Program Design and Data Structures</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, it is desirable, but not necessary, for applicants to have at least one year of appropriate work experience in building or modifying software systems.

Applicants must submit a one- to two-page statement of educational and work experience in the computing field that includes a statement of career goals in software engineering. Students not enrolled in a graduate degree program at Mason should apply for the certificate program through Graduate Admissions. Students already enrolled in a Mason graduate degree program should apply to the department for admission into the certificate program. Admission into the certificate program does not guarantee acceptance into any MS program.

Requirements

Certificate Requirements

Total credits: 12

This certificate may be pursued on a full-or part-time basis.

Requirements

Students must complete all requirements within a concentration.

Concentration in General (GEN)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWE 619</td>
<td>Object-Oriented Software Specification and Construction</td>
<td>3</td>
</tr>
<tr>
<td>SWE 621</td>
<td>Software Design and Architecture</td>
<td></td>
</tr>
<tr>
<td>SWE 632</td>
<td>User Interface Design and Development</td>
<td></td>
</tr>
<tr>
<td>SWE 637</td>
<td>Software Testing</td>
<td></td>
</tr>
<tr>
<td>CS 675</td>
<td>Distributed Systems</td>
<td></td>
</tr>
<tr>
<td>CS 706</td>
<td>Concurrent Software Systems</td>
<td></td>
</tr>
<tr>
<td>SWE 620</td>
<td>Software Requirements Analysis and Specification</td>
<td></td>
</tr>
<tr>
<td>SWE 625</td>
<td>Software Project Management</td>
<td></td>
</tr>
<tr>
<td>SWE 626</td>
<td>Software Project Laboratory</td>
<td></td>
</tr>
<tr>
<td>SWE 631</td>
<td>Software Design Patterns</td>
<td></td>
</tr>
<tr>
<td>SWE 632</td>
<td>User Interface Design and Development</td>
<td></td>
</tr>
</tbody>
</table>

Web-Based Software Engineering Concentration

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits. Applicants must complete a self-assessment form, which can be obtained from the department web site (https://cs.gmu.edu/). The form provides information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to that provided by the following courses:

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<tr>
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<tr>
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<tr>
<td>SWE 510</td>
<td>Object-Oriented Programming in Java</td>
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</tr>
<tr>
<td>INFS 515</td>
<td>Computer Organization Course and Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>INFS 519</td>
<td>Program Design and Data Structures</td>
<td>3</td>
</tr>
</tbody>
</table>

Policies

Students must complete four courses with an average GPA of 3.0 or higher for a total of 12 credits of graduate study.

For policies governing all graduate certificates, see AP.6.8 Requirements for Graduate Certificates. (http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-8)
Software Engineering Graduate Certificate

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWE 637</td>
<td>Software Testing</td>
</tr>
<tr>
<td>SWE 645</td>
<td>Component-Based Software Development</td>
</tr>
<tr>
<td>SWE 681</td>
<td>Secure Software Design and Programming</td>
</tr>
<tr>
<td>SWE 699</td>
<td>Special Topics in Software Engineering</td>
</tr>
<tr>
<td>SWE 721</td>
<td>Reusable Software Architectures</td>
</tr>
<tr>
<td>SWE 760</td>
<td>Software Analysis and Design of Real-Time Systems</td>
</tr>
<tr>
<td>SWE 763</td>
<td>Software Engineering Experimentation</td>
</tr>
<tr>
<td>SWE 795</td>
<td>Advanced Topics in Software Engineering</td>
</tr>
<tr>
<td>SWE 798</td>
<td>Research Project</td>
</tr>
<tr>
<td>SYST 621</td>
<td>Systems Architecture Design</td>
</tr>
</tbody>
</table>

Total Credits: 12

1 Subject to satisfying the prerequisites

Notes:
Students enrolled in the MS in Information Systems Program must substitute SWE 620 Software Requirements Analysis and Specification for INFS 622 Information Systems Analysis and Design to obtain this certificate. Credit is not given for taking both INFS 622 Information Systems Analysis and Design and SWE 620 Software Requirements Analysis and Specification; only 3 credits will be awarded.

Students enrolled in the MS in Computer Science Program may obtain a certificate in software engineering by taking any four SWE courses. If CS 706 Concurrent Software Systems is included, it is possible to complete the MS in Computer Science and the certificate in software engineering in 30 hours.

Concentration in Web-Based Software Engineering (WBSE)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required Courses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWE 632</td>
<td>User Interface Design and Development</td>
<td>3</td>
</tr>
<tr>
<td>SWE 642</td>
<td>Software Engineering for the World Wide Web</td>
<td>3</td>
</tr>
<tr>
<td>Select two from the following:</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>CS 550</td>
<td>Database Systems</td>
<td></td>
</tr>
<tr>
<td>ISA 656</td>
<td>Network Security</td>
<td></td>
</tr>
<tr>
<td>SWE 619</td>
<td>Object-Oriented Software Specification and Construction</td>
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<td>Secure Software Design and Programming</td>
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