COMPUTING FOUNDATIONS GRADUATE CERTIFICATE

Banner Code: EC-CERG-CMFD

Academic Advising

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

Admissions & Policies

Admissions

In addition to general admission requirements of the university, applicants to the certificate are normally expected to have earned a GPA of 3.00 or higher in the last 60 credits of undergraduate study. Applicants must also submit a goals statement and a resume.

Bridge Pathway Opportunities

The Computing Foundations Graduate Certificate offers opportunities for admitted students to directly matriculate into the Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) or Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/systems-engineering-ms/) upon certificate conferral and without a new graduate admission application.

Certificate to Master's Bridge Program Policies can be found in AP.6 (https://catalog.gmu.edu/policies/academic/graduate-policies/). To be considered for a Bridge Pathway, students must elect the specific option on their Computing Foundations Graduate Certificate admission application (https://www.gmu.edu/graduate/apply/). Students who do not choose a bridge pathway option on their admission application, but later wish to continue in a Master's program must submit a new Graduate Admission application (https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/) in accordance with University deadlines.

Policies

- Graduate Policies can be found in AP.6 (https://catalog.gmu.edu/policies/academic/graduate-policies/).
- Students are assumed to have had prior preparation in algebra. Students who intend to undertake more advanced or specialized coursework, or degree studies in computing beyond what is taught in the certificate program, may need to supplement their learning with additional preparation in subjects such as calculus or statistics.
- Advisement prior to course registration may be required.
- The program may allow substitution of course requirements on a case-by-case basis, depending on prior undergraduate preparation.

Requirements

Certificate Requirements

Total credits: 18

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

All students must complete 18 credits of coursework inclusive of: four required core courses (12 credits), and two elective courses (6 credits).

Core Courses

Code	Title	Credits
COMP 501	Computer Programming Foundations I	3
COMP 502	Mathematical Foundations of Computing I	3
COMP 503	Computer Systems Foundations I	3
COMP 511	Computer Programming Foundations II	3
Total Credits		**12**

Restricted Electives

Students must select two courses (6 credits) to complete the certificate.

Electives for non-bridge pathway students:

Code	Title	Credits
Select two from the following:		6
COMP 512	Mathematical Foundations of Computing II	
COMP 513	Computer Systems Foundations II	
CS 504	Principles of Data Management and Mining	
Total Credits		**6**

Electives for Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) bridge pathway students:

Code	Title	Credits
COMP 512	Mathematical Foundations of Computing II	3
COMP 513	Computer Systems Foundations II	3
Total Credits		**6**

Electives for Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/systems-engineering-ms/) bridge pathway students:

Code	Title	Credits
SWE 619	Object-Oriented Software Specification and Construction	3
SWE 621	Software Design and Architecture	3
Total Credits		**6**

Program Outcomes

Program Outcomes

Students will learn:

- Important mathematical underpinnings of computing.
- Essential design principles of computer systems.
- Techniques for developing software for computer systems.
- To design, develop, test, and debug moderate-size programs to perform useful functions and provide effective solutions to problems.

Bridge Pathway Options

Computing Foundations Graduate Certificate/Computer Science, MS Bridge Pathway

Overview

The field of computing refers to a variety of processes grounded in computational thinking. These processes include designing and constructing software systems to process information, to create communications and entertainment, and to identify information relevant to a particular purpose or problem. The emergence of new computing industries, the increased reliance on computation in all parts of society, and the demand for computing throughout a worldwide economy reflect computing's broad applications. As the field of computing has evolved, jobs in many fields now focus on the use of software.

The Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) provides a bridge to computing opportunities for students with undergraduate backgrounds in disciplines other than computer science-related areas of study. Students will learn how computers work and how software is designed, written, and deployed. Students will learn practical skills in developing software and be prepared to conceptualize, design, and implement software. Graduates will be able to analyze problems and design software to solve those problems, and develop effective and efficient software implementations.

Certificate to Master's Bridge Program Policies can be found in AP.6 (https://catalog.gmu.edu/policies/academic/graduate-policies/).

Admission Requirements

Students must be admitted to the Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) and elect a bridge pathway option as part of their application. Students who do not choose a bridge pathway option, but later wish to continue in the Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) program, must submit a new Graduate Admission application (https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/) in accordance with University deadlines.

Bridge Continuation Requirements

Students who elected the bridge pathway on their graduate admission application and have applied for graduation from the Computing Foundations Graduate Certificate with a 3.0 or better GPA will be invited to join the Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) program for the semester that immediately follows (Fall or Spring).

Any certificate courses that the student anticipates applying toward the Master's must be completed by the semester or term of graduation specified on their transition form (https://registrar.gmu.edu/forms/graduate/) for the bridge program, be graded B or better, and be aligned with the respective Master's degree program requirements. Certificate courses, COMP 501 Computer Programming Foundations I, COMP 502 Mathematical Foundations of Computing I, COMP 503 Computer Systems Foundations I, COMP 511 Computer Programming Foundations II, COMP 512 Mathematical Foundations of Computing II, COMP 513 Computer Systems Foundations II and CS 504 Principles of Data Management and Mining may not be applied toward Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) degree requirements.

Certificate Conferral

Certificate students who elected a bridge pathway on their graduate admission application, and who are successfully completing their final term of Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) courses, must apply to graduate from the Certificate and submit a transition form to the Computer Science department before the graduation application inactivation deadline (https://registrar.gmu.edu/students/graduation/timelines/). Failure to apply to graduate and submit a transition form (https://registrar.gmu.edu/forms/graduate/) to the department before the graduation application inactivation deadline (https://registrar.gmu.edu/students/graduation/timelines/) may forfeit the bridge option and students may be required to submit a new Graduate Admission application (https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/) for a future term if they wish to proceed with the Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) degree program.

Master's Conferral

Students who have successfully completed all Computer Science, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) degree requirements within university time limits (AP.6.9.2 (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-9-2)) will have their Master's conferred after completing their application for graduation.

Computing Foundations Graduate Certificate/Software Engineering, MS Bridge Pathway

Overview

The field of computing refers to a variety of processes grounded in computational thinking. These processes include designing and constructing software systems to process information, to create communications and entertainment, and to identify information relevant to a particular purpose or problem. The emergence of new computing industries, the increased reliance on computation in all parts of society, and the demand for computing throughout a worldwide economy reflect

computing's broad applications. As the field of computing has evolved, jobs in many fields now focus on the use of software.

The Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) provides a bridge to computing opportunities for students with undergraduate backgrounds in disciplines other than computer science-related areas of study. Students will learn how computers work and how software is designed, written, and deployed. Students will learn practical skills in developing software and be prepared to conceptualize, design, and implement software. Graduates will be able to analyze problems and design software to solve those problems, and develop effective and efficient software implementations.

Admission Requirements

Students must be admitted to the Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) and elect a bridge pathway option as part of their application. Students who do not choose a bridge pathway option, but later wish to continue in the Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/software-engineering-ms/) program, must submit a new Graduate Admission application (https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/) in accordance with University deadlines.

Bridge Continuation Requirements

Students who elected the bridge pathway on their graduate admission application and have applied for graduation from the Computing Foundations Graduate Certificate with a 3.0 or better GPA will be invited to join the Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/software-engineering-ms/) program for the semester that immediately follows (Fall or Spring).

Any certificate courses that the student anticipates applying toward the Master's must be completed by the semester or term of graduation specified on their transition form (https://registrar.gmu.edu/forms/graduate/) for the bridge program, be graded B or better, and be aligned with the respective Master's degree program requirements.

Certificate electives designated for Software Engineering, MS Bridge students, SWE 619 Object-Oriented Software Specification and Construction and SWE 621 Software Design and Architecture may count toward Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/software-engineering-ms/) degree requirements.

Certificate Conferral

Certificate students who elected a bridge pathway on their graduate admission application, and who are successfully completing their final term of Computing Foundations Graduate Certificate (https://catalog.gmu.edu/colleges-schools/engineering-computing/computing-foundations-graduate-certificate/) courses, must apply to graduate from the Certificate and submit a transition form (https://registrar.gmu.edu/forms/graduate/) to the Computer Science department before the graduation application inactivation deadline (https://registrar.gmu.edu/students/graduation/timelines/). Failure to apply to graduate and submit a transition form (https://registrar.gmu.edu/forms/graduate/) to the department before the graduation application inactivation deadline (https://registrar.gmu.edu/students/graduation/timelines/) may forfeit the bridge option and students may be required to submit a new Graduate

Admission application (https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/) for a future term if they wish to proceed with the Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/software-engineering-ms/) degree program.

Master's Conferral

Students who have successfully completed all Software Engineering, MS (https://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/computer-science/computer-science-ms/) degree requirements within university time limits (AP.6.9.2 (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-9-2)) will have their Master's conferred after completing their application for graduation.