COMPUTER ENGINEERING, MS

Banner Code: EC-MS-CPE

Academic Advising

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Computer Engineering involves knowledge of hardware and software development. The students learn how to design new generations of computers, as well as embedded computing systems, such as those found in smartphones, cars, appliances, computer networks, smart factories, and the internet-of-things. The program covers the entire digital integrated circuit design process targeting Field Programmable Gate Arrays (FPGAs) and Application Specific Integrated Circuits (ASICs), using various optimization criteria, such as speed, cost, power, energy, reliability, and security. It also encompasses the complete software development process targeting microcontrollers, microprocessors, multi-cores, and Graphics Processing Units (GPUs). It teaches students how to efficiently partition the system into software and hardware components, and develop high-performance interfaces between these two parts. Project-oriented courses and labs expose students to modern computer-aided design tools for hardware and software design. The students master the art of writing comprehensive technical reports and giving successful oral presentations. The computer engineering program offers the following concentrations: computer architecture and embedded systems, computer networks, digital signal processing, digital system design, hardware security and cryptographic engineering, internet of things and network security, machine learning and intelligent computing architectures, and space-based systems.

Admissions & Policies

Admissions

Requirements

Applicants should have a baccalaureate degree preferably in computer engineering, computer science engineering, electrical engineering, electronics and communication engineering, or a closely-related discipline.

Students with BS or MS degrees in other science, technology, engineering, and mathematics (STEM) disciplines are encouraged to apply for admission as well. Such students may be advised to take some courses from the undergraduate computer engineering curriculum or a professional certificate offered by Mason, according to their intended concentration and specific backgrounds. Domestic students may be admitted provisionally and required to satisfy provisional requirements before taking advanced coursework.

Candidates must meet the general university graduate admission eligibility requirements, as defined in the catalog section Graduate Admission Policies (https://catalog.gmu.edu/admissions/graduate-policies/), under General Admission Requirements, including a minimum 3.00 GPA on a 4.00 scale.

All students are required to submit a resume. They are also encouraged to provide up to three choices for their preferred academic advisor (selected from the list available on the ECE Department website (https://ece.gmu.edu/people/faculty/)) and declare their preliminary concentration choice. The concentration can be changed during the entire time in the program.

For internationally educated applicants, a satisfactory score on any of the English proficiency examinations accepted by Mason is required. Satisfactory scores are specific to the College of Engineering and Computing. They are listed on the English Proficiency Requirements page (https://www.gmu.edu/admissions-aid/apply-now/how-apply/international/english-proficiency-requirements/) of the Mason website.

Policies

Student Advising

Students can select a concentration from those available in the MS degree program at the time of application to the program or later during their studies. In the former case, students are assigned an academic advisor from the selected concentration at the time of admission. In the latter case, students can petition for a change of an academic advisor to match their concentration choice.

Plan of Study

Before completing 6 credit hours of coursework, each student must submit to the department a plan of study that has been approved by the academic advisor. This plan should be kept up to date by regular consultation with the academic advisor. A final, signed version of the plan must be turned in when the student submits a graduation application.

Requirements

Degree Requirements

Total credits: 30

Students must complete a minimum of 30 graduate credits beyond the bachelor's degree. The plan of study for the degree must fulfill the requirements specified below. The same course can be used to fulfill multiple requirements, e.g., any relevant subset of the following requirements: core course, concentration, upper-level, ECE course, GPA, and scholarly paper requirements.

Core Course Requirement

Code	Title	Credits
Select 15 credits from the following:		15
ECE 505	Hardware Security	
ECE 508	Internet of Things	
ECE 511	Computer Architecture	
ECE 516	Mobile Systems and Applications	
ECE 527	Learning From Data	
ECE 528	Introduction to Random Processes in Electrical and Computer Engineering	

ECE 535	Digital Signal Processing	
ECE 542	Computer Network Architectures and Protocols	
ECE 545	Digital System Design with VHDL	
ECE 547	Applied Cryptography	
ECE 554	Machine Learning for Embedded Systems	
ECE 555	GPU Architecture and Programming	
ECE 556	Neuromorphic Computing	
ECE 580	Small Spacecraft Engineering	
ECE 611	Advanced Computer Architecture	
ECE 799	Master's Thesis [1]	
Total Credits		**15**

[1] See Thesis/Scholarly Paper option.

Concentration Requirement

Accomplished by choosing one of the concentrations and then meeting the course requirements for this concentration. Courses required for the selected concentration must be passed with a grade of B or better. For each concentration, related ECE 590 Selected Topics in Engineering courses can be used in addition to all explicitly listed 500-level courses, and related ECE 699 Advanced Topics in Electrical and Computer Engineering courses can be used in addition to all explicitly listed 600 level or above courses, subject to approval by the student's academic advisor. With assistance from their advisors, students may petition the graduate program coordinator to approve a specialization area of their own design, not fulfilling the requirements of any concentration.

Available Concentrations

- Concentration in Computer Architecture and Embedded Systems (CAES)
- Concentration in Computer Networks (CNWK)
- Concentration in Digital Signal Processing (DISP)
- Concentration in Digital System Design (DSYD)
- Concentration in Hardware Security and Cryptographic Engineering (HSCE)
- Concentration in Internet of Things and Network Security (INNS)
- Concentration in Machine Learning and Intelligent Computing Architectures (MLIC)
- Concentration in Space-Based Systems (SBSY)

Concentration in Computer Architecture and Embedded Systems (CAES)

Code	Title	Credits
Required Courses		
ECE 511	Computer Architecture	3
ECE 516	Mobile Systems and Applications	3
or ECE 555	GPU Architecture and Programming	
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
CS 571	Operating Systems	
CS 583	Analysis of Algorithms	
ECE 508	Internet of Things	
ECE 512	Computer Architecture Security	
ECE 516	Mobile Systems and Applications	
ECE 545	Digital System Design with VHDL	
ECE 554	Machine Learning for Embedded Systems	
ECE 555	GPU Architecture and Programming	
ECE 570	Quantum Computing System Design	
ECE 611	Advanced Computer Architecture	
ECE 612	Real-Time Embedded Systems	
ECE 615	Software/Hardware Codesign	
ECE 616	Advanced Mobile Systems and Applications	
ECE 655	Advanced GPU Programming and Deep Learning	
Total Credits		9

Concentration in Computer Networks (CNWK)

Code	Title	Credits
Required Courses		
ECE 542	Computer Network Architectures and Protocols	3
TCOM 535	The TCP/IP Suite of Internet Protocols	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
ECE 508	Internet of Things	
ECE 531	Introduction to Wireless Communications and Networks	
ECE 532	Secure Wireless Communications and Networks	
ECE 547	Applied Cryptography	
ECE 629	Wireless Networks	
ECE 633	Error Control Coding	
ECE 642	Design and Analysis of Computer Networks	
ECE 643	Network Switching and Routing	
ECE 647	Post-Quantum Cryptography	
TCOM 515	Internet Protocol Routing: Lecture and Laboratory Course	
TCOM 570	Network Automation	
TCOM 610	Border Gateway Protocol (BGP) Routing	
TCOM 616	Cloud Network Technologies	
Total Credits		**9**

Concentration in Digital Signal Processing (DISP)

Code	Title	Credits
Required Courses		
ECE 535	Digital Signal Processing	3
ECE 545	Digital System Design with VHDL	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
ECE 527	Learning From Data	
ECE 528	Introduction to Random Processes in Electrical and Computer Engineering	
ECE 530	Sensor Engineering	
ECE 531	Introduction to Wireless Communications and Networks	
ECE 537	Image Processing and Computer Vision	
ECE 615	Software/Hardware Codesign	
ECE 630	Principles of Digital Communications	
ECE 631	Software-Defined Radio	
ECE 632	Digital Communications	
ECE 633	Error Control Coding	
ECE 635	Adaptive Signal Processing	
ECE 636	Advanced Digital Signal Processing	
ECE 645	Computer Arithmetic	
ECE 648	Digital Signal Processing Hardware Architectures	
ECE 651	Advanced Learning From Data	
Total Credits		**9**

Concentration in Digital System Design (DSYD)

Code	Title	Credits
Required Courses		
ECE 511	Computer Architecture	3
ECE 545	Digital System Design with VHDL	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
ECE 505	Hardware Security	
ECE 527	Learning From Data	
ECE 554	Machine Learning for Embedded Systems	
ECE 556	Neuromorphic Computing	
ECE 570	Quantum Computing System Design	
ECE 586	Digital Integrated Circuits	
ECE 615	Software/Hardware Codesign	
ECE 618	Hardware Accelerators for Machine Learning	
ECE 645	Computer Arithmetic	
ECE 648	Digital Signal Processing Hardware Architectures	
ECE 681	VLSI Design for ASICs	
ECE 683	VLSI Verification, Testing, and Security	
Total Credits		**9**

Concentration in Hardware Security and Cryptographic Engineering (HSCE)

Code	Title	Credits
Required Courses		
ECE 505	Hardware Security	3
ECE 547	Applied Cryptography	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
ECE 511	Computer Architecture	
ECE 512	Computer Architecture Security	
ECE 527	Learning From Data	
ECE 542	Computer Network Architectures and Protocols	
ECE 545	Digital System Design with VHDL	
ECE 570	Quantum Computing System Design	
ECE 586	Digital Integrated Circuits	
ECE 615	Software/Hardware Codesign	
ECE 633	Error Control Coding	
ECE 645	Computer Arithmetic	
ECE 647	Post-Quantum Cryptography	
ECE 649	Side-Channel Security	
ECE 653	Machine Learning Security and Privacy	
ECE 681	VLSI Design for ASICs	
ECE 683	VLSI Verification, Testing, and Security	
ECE 747	Cryptographic Engineering	
Total Credits		**9**

Concentration in Internet of Things & Network Security (INNS)

Code	Title	Credits
Required Courses		
ECE 508	Internet of Things	3
ECE 542	Computer Network Architectures and Protocols	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including two courses at the 600 level or above:		9
CYSE 682	Formal Methods for Cyber Physical Systems Security	
CYSE 683	Reverse Engineering Industrial Automation	
ECE 511	Computer Architecture	

ECE 512	Computer Architecture Security	
ECE 530	Sensor Engineering	
ECE 532	Secure Wireless Communications and Networks	
ECE 547	Applied Cryptography	
ECE 611	Advanced Computer Architecture	
ECE 612	Real-Time Embedded Systems	
ECE 633	Error Control Coding	
ECE 642	Design and Analysis of Computer Networks	
ECE 647	Post-Quantum Cryptography	
ECE 649	Side-Channel Security	
ECE 653	Machine Learning Security and Privacy	
ECE 747	Cryptographic Engineering	
SWE 619	Object-Oriented Software Specification and Construction	
SWE 681	Secure Software Design and Programming	
Total Credits		**9**

Machine Learning and Intelligent Computing Architectures (MLIC)

Code	Title	Credits
Required Courses		
ECE 554	Machine Learning for Embedded Systems	3
ECE 556	Neuromorphic Computing	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including at least two courses at the 600 level or above:		9
CS 580	Introduction to Artificial Intelligence	
CS 584	Theory and Applications of Data Mining	
ECE 527	Learning From Data	
ECE 552	Big Data Technologies	
ECE 553	GenAI and LLM Technologies	
ECE 555	GPU Architecture and Programming	
ECE 570	Quantum Computing System Design	
ECE 616	Advanced Mobile Systems and Applications	
ECE 617	Distributed and Federated Learning	
ECE 618	Hardware Accelerators for Machine Learning	
ECE 651	Advanced Learning From Data	
ECE 653	Machine Learning Security and Privacy	
ECE 655	Advanced GPU Programming and Deep Learning	
ECE 681	VLSI Design for ASICs	

Concentration in Space-Based Systems (SBSY)

Code	Title	Credits
Required Courses		
ECE 580	Small Spacecraft Engineering	3
ECE 660	Space Systems Engineering	3
Total Credits		**6**

Code	Title	Credits
Electives		
Select at least three courses from the following, including at least one course at the 600 level or above:		9
ECE 511	Computer Architecture	
ECE 528	Introduction to Random Processes in Electrical and Computer Engineering	
ECE 530	Sensor Engineering	
ECE 535	Digital Signal Processing	
ECE 545	Digital System Design with VHDL	
ECE 547	Applied Cryptography	
ECE 611	Advanced Computer Architecture	
ECE 612	Real-Time Embedded Systems	
ECE 615	Software/Hardware Codesign	
ECE 631	Software-Defined Radio	
ECE 635	Adaptive Signal Processing	
ECE 640	Small Satellite Development	
ECE 647	Post-Quantum Cryptography	
ECE 648	Digital Signal Processing Hardware Architectures	
ECE 747	Cryptographic Engineering	
Total Credits		**9**

Upper-Level Course Requirement

A minimum of 9 credit hours of ECE (https://catalog.gmu.edu/courses/ece/) or CS (https://catalog.gmu.edu/courses/cs/) courses at the 600 level or above, other than ECE 799 (including, but not limited to, the selected concentration electives). No more than 3 credit hours of either ECE 698 or ECE 798 may be used to fulfill this requirement.

ECE Course Requirement

A maximum of 6 credits of non-ECE courses may be used to fulfill degree requirements, subject to prior approval by the student's academic advisor, in the form of a plan of study signed by the advisor and submitted to the ECE Office. Additional 6 credit hours of CS (https://catalog.gmu.edu/courses/cs/), CYSE (https://catalog.gmu.edu/courses/cyse/), DFOR (https://catalog.gmu.edu/courses/dfor/), ISA (https://catalog.gmu.edu/courses/isa/), SWE (https://catalog.gmu.edu/courses/swe/), or TCOM (https://catalog.gmu.edu/courses/tcom/) courses may be used to fulfill degree requirements, subject to the same approval process.

Electives

Electives can be chosen from among all ECE graduate courses, as well as related graduate courses with other designations. The students are encouraged to discuss their choice of electives with their academic advisor prior to the registration.

GPA Requirements

A maximum of 6 credits of courses with a grade of C may be applied toward the degree. The student must present a GPA of at least 3.00 for all courses submitted for degree conferral.

Seminar Requirement

Graduate students are expected to participate actively in the exchange of knowledge and ideas in their discipline. Towards this objective, all degree candidates must attend a minimum of 6 graduate seminars approved for the degree program. Approved seminars are publicized on the departmental webpage.

To demonstrate completion of the seminar requirement, students must register for ECE 795 Engineering Seminar in their final semester. The department office will verify that the seminar requirement has been met and submit a grade of S (satisfactory) upon completion of the requirement. Students who have not met the seminar requirement in their final semester must continue to register for ECE 795 Engineering Seminar in subsequent semesters until the requirement is met.

Thesis/Scholarly Paper Option

To complete the program, students may select one of the following options, with departmental approval:

Thesis Option

Students who select this option must complete:

Code	Title	Credits
ECE 799	Master's Thesis	6
Coursework		24
Total Credits		**30**

The thesis is particularly recommended for those students who wish to develop and document their research skills or contemplate subsequent enrollment in a PhD program. The thesis involves a research effort, which is conducted under the guidance of a faculty advisor. Choosing the thesis option requires approval of a full-time faculty member willing to serve as a thesis advisor. The topic and scope of the thesis must be approved by the thesis advisor. In some cases, permission may be granted to complete a portion of the work at the student's place of employment. The final written thesis and oral defense are approved by the student's advisory committee.

This committee consists of at least three full-time faculty members, including two affiliated with the MS in Computer Engineering Program, one of whom must be from the ECE Department. Thesis students may not register for ECE 798 Research Project. Students must register for at least 3 credits of ECE 799 Master's Thesis for their first thesis semester. Following their first thesis semester, they must register for at least 1 credit of ECE 799 Master's Thesis each fall and spring semester until graduation.

Scholarly Paper Option

Students who select to complete their degree program with a scholarly paper must:

Code	Title	Credits
Complete 30 credits of coursework		30
ECE 797	Scholarly Paper	0
Enroll in a 600-level or above course requiring a research project		
Write a Scholarly Paper project report and present findings as part of the course requirements		
Total Credits		**30**

An acceptable scholarly paper must be technically sound, adhere to accepted formatting standards for technical reports, and contain a significant literature review evidenced by a comprehensive list of cited references.

A list of courses requiring projects that can be used to satisfy the scholarly paper requirement will be published on the department website. Scholarly papers must be individual written project reports – not group projects. To qualify as a scholarly paper, an oral presentation of the project is required. A passing grade for the project, reflecting both the written report and the oral presentation, satisfies the scholarly paper requirement.

A successful scholarly paper will be recorded by awarding a satisfactory (S) grade for ECE 797 Scholarly Paper. Students are eligible to attempt the scholarly paper and register for ECE 797 Scholarly Paper after completion of 18 hours of coursework. Students choosing the scholarly paper option are not eligible for graduation until they have received a final, passing grade for ECE 797 Scholarly Paper.

Accelerated Master's

Computer Engineering, BS/Computer Engineering, Accelerated MS

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BS in Computer Engineering (https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/electrical-computer/computer-engineering-bs/) and an MS in Computer Engineering in an accelerated time-frame after satisfactory completion of a minimum of 144 credits.

See AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7) for policies related to this program.

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/).

BAM Pathway Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies and Bachelor's/Accelerated Master's Degree policies.

Students will be considered for admission into the BAM Pathway after completion of a minimum of 60 credits with an overall GPA of 3.0.

Students who are accepted into the BAM Pathway will be allowed to register for graduate level courses after successful completion of a minimum of 75 undergraduate credits and course-specific prerequisites.

Accelerated Master's Admission Requirements

Students already admitted in the BAM Pathway will be admitted to the MS program, if they have met the following criteria, as verified on the Bachelor's/Accelerated Master's Transition form: 3.0 overall GPA, successfully meeting Mason's requirements for undergraduate degree conferral (graduation), and completing the application for graduation.

Accelerated Pathway Requirements

To maintain the integrity and quality of both the undergraduate and graduate degree programs, undergraduate students interested in taking graduate courses must choose from the following:

Advanced standing courses: Students may take up to 12 credits of graduate-level courses that will count as advanced standing (i.e., overlap between the BS/MS program) from the list below: Note that ECE 542 can be used to meet the ECE 465 requirement for the BS in Computer Engineering program. An additional 9 credits of graduate-level courses from the list below may be selected to substitute in place of the 9 credits of technical electives required for the undergraduate degree:

Code	Title	Credits
ECE 505	Hardware Security	3
ECE 508	Internet of Things	3
ECE 511	Computer Architecture	3
ECE 512	Computer Architecture Security	3
ECE 516	Mobile Systems and Applications	3
ECE 521	Linear Systems and Control	3
ECE 527	Learning From Data	3
ECE 528	Introduction to Random Processes in Electrical and Computer Engineering	3
ECE 530	Sensor Engineering	3
ECE 531	Introduction to Wireless Communications and Networks	3
ECE 532	Secure Wireless Communications and Networks	3
ECE 535	Digital Signal Processing	3
ECE 542	Computer Network Architectures and Protocols	3
ECE 545	Digital System Design with VHDL	3
ECE 552	Big Data Technologies	3
ECE 554	Machine Learning for Embedded Systems	3
ECE 555	GPU Architecture and Programming	3
ECE 556	Neuromorphic Computing	3
ECE 567	Optical Fiber Communications	3
ECE 580	Small Spacecraft Engineering	3
ECE 590	Selected Topics in Engineering	3

Selected 600 level courses may be taken as well with permission of an advisor granted before registering for a given course.

Reserve credit courses: Additional courses (up to 6 credits) may be selected from the above list as credits to be put on reserve to be later applied to the graduate program. Students can take these courses while undergraduates but these reserve courses will only count for the graduate degree program.

For more detailed information on coursework and timeline requirements, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7).

Degree Conferral

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form. At the completion of MS requirements, a master's degree is conferred.

Computer Science, BS/Computer Engineering, Accelerated MS

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BS in Computer Science and an MS in Computer Engineering in an accelerated time-frame after satisfactory completion of a minimum of 138 credits.

See
AP.6.7 Bachelor's/Accelerated Master's Degrees for policies related to this program.

This accelerated option is offered jointly by the Computer Science Department and the Electrical and Computer Engineering Department.

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see
AP.6 Graduate Policies.

BAM Pathway Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies and Bachelor's/Accelerated Master's Degree policies.

Students will be considered for admission into the BAM Pathway after completion of a minimum of 60 credits with an overall GPA of 3.0.

Students who are accepted into the BAM Pathway will be allowed to register for graduate level courses after successful completion of a minimum of 75 undergraduate credits and course-specific prerequisites.

Accelerated Master's Admission Requirements

Students already admitted in the BAM Pathway will be admitted to the MS program, if they have met the following criteria, as verified on the Bachelor's/Accelerated Master's Transition form: 3.0 overall GPA, successfully meeting Mason's requirements for undergraduate degree conferral (graduation), at least 3 credits of approved advanced standing graduate coursework, and completing the application for graduation.

Accelerated Pathway Requirements

To maintain the integrity and quality of both the undergraduate and graduate degree programs, undergraduate students interested in taking graduate courses must choose from the following:

Advanced standing courses: Students may take up to 12 credits of graduate-level courses that will count as advanced standing (i.e., overlap between the BS/MS program) from the list below:

Code	Title	Credits
CS 571	Operating Systems (to replace CS 471)	3
CS 580	Introduction to Artificial Intelligence	3
CS 583	Analysis of Algorithms	3
CS 584	Theory and Applications of Data Mining	3
ECE 508	Internet of Things	3
ECE 511	Computer Architecture	3

ECE 512	Computer Architecture Security	3
ECE 516	Mobile Systems and Applications	3
ECE 527	Learning From Data	3
ECE 542	Computer Network Architectures and Protocols	3

Reserve credit courses: Additional courses (up to 6 credits) may be selected from the above list as credits to be put on reserve to be later applied to the graduate program. Students can take these courses while undergraduates but these reserve courses will only count for the graduate degree program.

For more detailed information on coursework and timeline requirements, see AP.6.7 Bachelor's/Accelerated Master's Degrees.

Cyber Security Engineering, BS/Computer Engineering, Accelerated MS

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BS in Cyber Security Engineering (https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/cyber-security-engineering/cyber-security-engineering-bs/) and an MS in Computer Engineering in an accelerated time-frame after satisfactory completion of a minimum of 150 credits.

See AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7) for policies related to this program.

This accelerated option is offered jointly by the Cyber Security Engineering Department and the Electrical and Computer Engineering Department.

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/).

BAM Pathway Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies and Bachelor's/Accelerated Master's Degree policies.

Students will be considered for admission into the BAM Pathway after completion of a minimum of 60 credits with an overall GPA of 3.0.

Students who are accepted into the BAM Pathway will be allowed to register for graduate level courses after successful completion of a minimum of 75 undergraduate credits and course-specific pre-requisites.

Accelerated Master's Admission Requirements

Students already admitted in the BAM Pathway will be admitted to the MS program, if they have met the following criteria, as verified on the Bachelor's/Accelerated Master's Transition form: 3.0 overall GPA, successfully meeting Mason's requirements for undergraduate degree conferral (graduation), and completing the application for graduation.

Accelerated Pathway Requirements

To maintain the integrity and quality of both the undergraduate and graduate degree programs, undergraduate students interested in taking graduate courses must choose from the following:

Advanced standing courses: Students may take up to 6 credits of graduate-level courses that will count as advanced standing (i.e., overlap between the BS/MS program) from the list below:

Code	Title	Credits
ECE 505	Hardware Security	3
ECE 508	Internet of Things	3
ECE 511	Computer Architecture	3
ECE 512	Computer Architecture Security	3
ECE 542	Computer Network Architectures and Protocols	3
ECE 554	Machine Learning for Embedded Systems	3

These courses may be used as technical electives in the Cyber Security Engineering, BS program.

Reserve credit courses: Additional courses (up to 6 credits) may be selected from the above list as credits to be put on reserve to be later applied to the graduate program. Students can take these courses while undergraduates but these reserve courses will only count for the graduate degree program.

For more detailed information on coursework and timeline requirements, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7).

Degree Conferral

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form. At the completion of MS requirements, a master's degree is conferred.

Electrical Engineering, BS/Computer Engineering, Accelerated MS

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BS in Electrical Engineering (https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/electrical-computer/electrical-engineering-bs/) and an MS in Computer Engineering in an accelerated time-frame after satisfactory completion of a minimum of 139 credits.

See AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7) for policies related to this program.

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/).

BAM Pathway Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate

study as specified in Graduate Admissions Policies and Bachelor's/Accelerated Master's Degree policies.

Students will be considered for admission into the BAM Pathway after completion of a minimum of 60 credits with an overall GPA of 3.0.

Students who are accepted into the BAM Pathway will be allowed to register for graduate level courses after successful completion of a minimum of 75 undergraduate credits and course-specific pre-requisites.

Accelerated Master's Admission Requirements

Students already admitted in the BAM Pathway will be admitted to the MS program, if they have met the following criteria, as verified on the Bachelor's/Accelerated Master's Transition form: 3.0 overall GPA, successfully meeting Mason's requirements for undergraduate degree conferral (graduation), and completing the application for graduation.

Accelerated Pathway Requirements

To maintain the integrity and quality of both the undergraduate and graduate degree programs, undergraduate students interested in taking graduate courses must choose from the following:

Advanced standing courses: Students may take up to 12 credits of graduate-level courses that will count as advanced standing (i.e., overlap between the BS/MS program) from the list below. Note that ECE 587 can be used to meet the ECE 433 requirement for the BS in Electrical Engineering program. An additional 9 credits of graduate-level courses from the list below may be selected to substitute in place of the 9 credits of technical electives required for the undergraduate degree.

Code	Title	Credits
ECE 505	Hardware Security	3
ECE 508	Internet of Things	3
ECE 511	Computer Architecture	3
ECE 512	Computer Architecture Security	3
ECE 516	Mobile Systems and Applications	3
ECE 521	Linear Systems and Control	3
ECE 527	Learning From Data	3
ECE 528	Introduction to Random Processes in Electrical and Computer Engineering	3
ECE 530	Sensor Engineering	3
ECE 531	Introduction to Wireless Communications and Networks	3
ECE 532	Secure Wireless Communications and Networks	3
ECE 535	Digital Signal Processing	3
ECE 542	Computer Network Architectures and Protocols	3
ECE 545	Digital System Design with VHDL	3
ECE 552	Big Data Technologies	3
ECE 554	Machine Learning for Embedded Systems	3
ECE 555	GPU Architecture and Programming	3
ECE 556	Neuromorphic Computing	3
ECE 567	Optical Fiber Communications	3
ECE 580	Small Spacecraft Engineering	3
ECE 590	Selected Topics in Engineering	3

Selected 600 level courses may be taken as well with permission of an advisor granted before registering for a given course.

Reserve credit courses: Additional courses (up to 6 credits) may be selected from the above list as credits to be put on reserve to be later applied to the graduate program. Students can take these courses while undergraduates but these reserve courses will only count for the graduate degree program.

For more detailed information on coursework and timeline requirements, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7).

Degree Conferral

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form. At the completion of MS requirements, a master's degree is conferred.