TRANSFER GUIDE
Catalog Years: 2024-2025

George Mason University BS in Systems and Industrial Engineering

Associate Transfer Degree Plan in Engineering

COURSE REQUIREMENTS

Complete at Virginia Community College				Complete at George Mason University		
BACHELOR'S DEGREE REQUIREMENT		**SATISFIED BY**		**BACHELOR'S DEGREE REQUIREMENT**		
Course	**Credits**	**CC Course**	**Notes**	**Course**	**Credits**	**Notes**
General Elective: UNIV 100	1	SDV 100		Gen Ed: Upper Level Written Comm ENGH 302	3	
General Elective: ENGH ---	3	ENG 111		Major & Gen Ed: Oral Communication	0-3	Not needed if completed at the community college.
Gen Ed: Written Comm ENGH 101	3	ENG 112	Admission Requirement	STAT 344	3	
Gen Ed: Arts	3	ART 100, ART 101, ART 102, CST 130, CST 151, MUS 101	Course options listed are Passport and/or UCGS courses. Additional options may be available. Can be waived with degree completion.	STAT 354	3	
Gen Ed: Literature	3	ENG 225, ENG 245, ENG 246, ENG 250, ENG 255, ENG 258, ENG 275	Course options listed are Passport and/or UCGS courses. Additional options may be available. Can be waived with degree completion.	SYST 101	3	
Gen Ed: Global History	3	HIS 101, HIS 102, HIS 111, HIS 112	HIS 112 recommended Course options listed are Passport and/or UCGS courses. Additional options may be available. Can be waived with degree completion.	SYST 210	3	
Major & Gen Ed: Soc & Behav. Science: ECON 103	3	ECO 202		SYST 220 & SYST 221	4	
Major and Gen Ed: Quant: MATH 113	4	MTH 263	Students must earn an A or B in MTH 263 to be admitted to SYST.	SYST 230	4	
Major: MATH 114	4	MTH 264	Students must earn an A or B in MTH 264 to be admitted to SYST.	SYST 320	3	
Major: MATH 213	4	MTH 265		SYST 330	3	

Major: MATH 214	3	MTH 267		SYST 335	3	
Major & Gen Ed: Natural Science: PHYS 160/161	4	PHY 241		SYST 371	3	
Major & Gen Ed: Natural Science: PHYS 260/261	4	PHY 242		SYST 395	3	
Major: ENGR 107	2	EGR 121		SYST 470	3	
Major: SYST L375	3	EGR 206		SYST 473	3	
Major: ENGR 125T	4	EGR 125		SYST 475	3	
Major: MATH 203	3	MTH 266		SYST 489	3	Writing Intensive
Major & Gen Ed: Oral Comm: COMM 100 or 101	0-3	CST 100 or CST 110	As needed to meet AS degree requirements.	SYST 490	3	
Students should complete one of the following sequences. Major: Technical Emphasis Areas in Mechanical Engineering (ME 211, ME 231, AND ME 212) **OR** Electrical Engineering (ECE 231/232, ECE 285, AND ECE 286)	9 or 12	EGR 240, EGR 245 AND EGR 246 (9 credits)	Mechanical Engineering Technical Emphasis Option	SYST 495	3	Gen Ed: Apex
		EGR 270, EGR 271, AND EGR 272 (12 credits)	Electrical Engineering Technical Emphasis Area Option. ECE 231/232 fulfills ECE 301 requirement for transfer students only.	OR 441	3	
				OR 442	3	
				Technical Electives	0-9	Students select up to 9 credits of technical electives from one of the Technical Emphasis areas described below under “Do more with your degree”. These credits are only needed if the technical emphasis selected does not use EGR 270 + EGR 271 + EGR 272 OR EGR 240 + EGR 245 + EGR 246 OR does not use EGR 121 (ENGR 107) as an elective
				Gen Ed: Global Contexts	0-3	SYST 202 is highly recommended. Waived with Associate Transfer Degree Completion
CREDITS PRE-TRANSFER: 63-69				**CREDITS POST-TRANSFER: 65-75**		

TRANSFER GUIDANCE

Transfer Admission Requirements: Systems and Industrial Engineering

- Transfer applicants must have completed the equivalent of MATH 113 Calculus I (4 credits) and Math 114 Calculus II (4 credits) with grades of A or B in each MATH course before applying to Mason. MTH 263 and MTH 264 are the VCCS equivalents of MATH 113 and MATH 114, respectively.
- Transfer applicants must present a 2.5 or higher cumulative GPA for regular admission. GAA applicants must present a minimum 2.85 GPA.
- Prior to application, VCCS applicants should complete ENG 111 and ENG 112
- For more information about Guaranteed Admission Agreement Requirements, visit: https://www.vccs.edu/transfer-programs/

MPORTANT LINKS & DATES:

- **Office of Transfer Services:** https://www.gmu.edu/admissions-aid/apply-now/how-apply/transfer/office-transfer-services
- **Admission Application:** By Oct 1 or March 1 at https://www.gmu.edu/admissions-aid/apply-now
- **Financial Aid:** https://www.gmu.edu/financial-aid
- **FAFSA - Free Application for Federal Student Aid:** March 1 for Fall admission and October 1 for Spring admission at studentaid.gov

WHAT SHOULD I CONSIDER WHEN SELECTING COURSES?

- Completing all MTH, all PHY and EGR 125 is critical to continuing Systems and Industrial Engineering courses immediately upon transferring to Mason.
- Create a schedule for all required courses, pay attention to prerequisites and when courses are offered, complete your first math and English courses in your first year. For help, see Transfer Steps and Resource Center at www.TransferVirginia.org
- Connect with an advisor at your community college within your first year. College connect available in your account of www.TransferVirginia.org

IS THIS DEGREE RIGHT FOR ME?

- The engineering problems of the future are systems problems. As the systems around us grow more complex, the need grows for engineers who understand not just the pieces, but how they interact. Systems and Industrial engineers determine the most effective ways to use all of a system's components: people, machines, materials, information, and energy. Systems and Industrial engineers plan, design, implement, and manage integrated systems, working to ensure performance, safety, reliability, and maintainability. They also work to ensure that systems are delivered on time at a reasonable cost and satisfy the needs of diverse stakeholders who may have competing objectives. Examples of systems include the national air transportation system, computer networks, autonomous vehicles, intelligent robots, the electric power grid, healthcare systems, sustainable infrastructure systems, and financial trading systems. Systems and Industrial engineering, perhaps more than any other engineering discipline, is involved with the human and organizational aspects of developing the desired system. Systems and Industrial engineering is the people-oriented engineering profession.

WHAT IS THE IMPACT ON MY DEGREE OF WORK I HAVE ALREADY COMPLETED?

- **Associate Transfer Degree Completion:** Students who complete a VCCS transfer associate degree (AS, AA, AA&S, & AFA) will receive a waiver of the Foundation and Exploration (lower division) Mason Core general education categories. To be eligible for the waiver, the students must provide the Mason Office of Admissions with a final, official transcript reflecting the degree conferral date. As a prerequisite for ENGH 302, ENGH 101 is not waived. Students must complete ENGH 100 or ENGH 101, or an equivalent, with a C or higher.
- **Dual Enrollment – Completion of Associate Degree in HS:** Applicants are required to apply as freshman
- **Credit for Prior Learning:** Credit by exam may be used to fulfill General Education and/or major requirements. See: https://www.gmu.edu/admissions-aid/apply-now/how-apply/transfer/transfer-credit-policy
- **Catalog Year:** Catalog year determined by first term of attendance at Mason.

IS THIS COLLEGE RIGHT FOR ME?

- Located in Fairfax within the National Capital Region. Mason enrolls 26,000 undergraduate students, in 80 in-demand majors, from 50 states and 130 countries.
- 4.000 new transfer students choose Mason each year. Mason is consistently ranked as one of the most diverse universities in the U.S.
- Transfer students are welcome to live among our 7700-student residential community or off-campus. The Office of Contemporary Student Services is dedicated to the support of off-campus transfers.
- 66% of Mason students receive financial aid
- 22 Division I men's and women's teams and 475+ student organizations
- Learn more about our college at www.TransferVirginia.org

DID YOU KNOW THAT…

- The International Council on Systems Engineering (INCOSE) has approved the BS in Systems Engineering for academic equivalency. This means that students who earn a BS in Systems and Industrial Engineering, and who score well enough in certain required courses (taken during the effective dates of equivalency), can bypass the INCOSE systems engineering knowledge exam

when applying for ASEP (Associate Systems Engineering Professional) or CSEP (Certified Systems Engineering Professional) certification. We are only the second undergraduate program to have received this academic equivalency.

- SIE Jobs are in high demand - $116K average salary. Our graduates are highly recruited, and it's common for third and fourth-year students to get jobs in the field before graduation. A sample list of companies that recruit our graduates include MITRE, Booz Allen Hamilton, Boeing, Northrop Grumman, SAIC, Aviation Solutions, Govt. Agencies, Technomics, Innovative Decisions, CACI, CGI Federal, RAND Corp, Verizon, Lockheed Martin, Raytheon, VetsAmerica Business consulting, Peraton, Evidra, Accenture, USPTO, Tek Fusion, and so on.
- Our program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org
- In Spring, the graduating class attends the international Andrew Sage Memorial Design Competition hosted by the SEOR department at Mason where students from several universities present their capstone design projects to judges from the industry and government. The conference also includes an award ceremony and a banquet to recognize the best project under each track.

WHAT CAN I DO WITH THIS DEGREE?

- Explore possible careers, salaries, and job outlook at: www.TransferVirginia.org
- Systems and Industrial Engineers (SIE) perform the essential design for the systems that are composed of software, hardware, and mechanical components. SIEs do the engineering design and testing work to make sure all components work together seamlessly. Systems and Industrial engineers work with users and other stakeholders to ensure that the system design is safe, reliable, sustainable, and just, and meets the needs of its users and interacts appropriately with other systems. They analyze cost and performance of systems, often through modeling and simulation. They plan for the entire lifecycle of a system, from the time a need is first identified, through system design, development, operation, maintenance, and disposal. System and Industrial Engineers integrate the components of systems and conduct testing and evaluation of the overall system.
- As a Systems and Industrial Engineering graduate, you will have many career choices. Your skills can be applied across a variety of application domains – such as transportation, healthcare, environment, finance, space, and energy – and in a variety of positions. Your skills will be portable and marketable. Graduates of the program obtain positions such as: systems analyst, systems engineer, data scientist, policy analyst, operations research analyst, supply-chain manager, project engineer, senior scientist, government analyst, financial analyst, and others. Systems and Industrial engineers, with their focus on the big picture, have great opportunities in management.

PROGRAM SUCCESSES & HIGHLIGHTS

- The capstone design courses provide students an industry-like experience that includes technical, business, and professional skill development. The 2-semester team project is sponsored by a company, agency, research group, or non-profit organization.
- Our systems and industrial engineering faculty members are leaders in the areas of architecture-based systems integration, C4I and cyber (command, control, communications, computing, intelligence, and cyber), engineering resilient enterprise systems, communication and networking, financial systems, computational modeling, military operations research, air transportation systems, energy, and predictive data analytics. Our faculty members have in-depth knowledge and practical experience in systems and industrial engineering, and operations research, and help graduates excel in their careers by mentoring students on their senior capstone projects, implementing the latest techniques and technologies in the classroom, and working on interdisciplinary research projects of consequence.
- Students have the opportunity to work on engineering problems with broad societal impact, such as healthcare, climate change, energy, sustainability, and the environment.
- Students participate in national senior design competitions at the U.S. Military Academy, West Point, and the Andrew Sage Memorial Design Competition, hosted by the department.
- Awards and cash prizes have been won each year by students at these and other competitions.
- Sponsors often make job offers to students during the course of their capstone senior design work.

DO MORE WITH YOUR DEGREE!

- The program leading to the BS in Systems and Industrial Engineering prepares students for a professional career in systems engineering. The program reflects the systems and industrial engineer's unique perspective, which considers all aspects of a system throughout its lifetime. Mason's systems and industrial engineering program is interdisciplinary, drawing from engineering, computer science, operations research, psychology, and economics. The core systems and industrial engineering courses tie these diverse threads to provide a global understanding of how individual engineering disciplines fit into the development of complex, large-scale systems.
- Students gain depth in a technical area by selecting a sequence of technical electives that constitute an emphasis. Students choose their own emphasis with the help of their advisor. The Systems and Industrial Engineering program requires nine credit hours of technical electives. Students must select one of eleven specialization areas: Aviation Systems, Bioengineering, Computer Network Systems, Cyber Security Engineering, Electrical Engineering, Environmental Engineering, Financial Engineering, General Electives, Mechanical Engineering, Operations Research and Data Analytics, or Software Intensive Systems. All specializations and the corresponding plan of study must be approved by the student's advisor. Some courses in the above specializations have additional prerequisites. Refer to the catalog for the list of courses https://catalog.gmu.edu/
- A year-long senior design project provides hands-on experience in applying systems and industrial engineering methods and tools. In the first two years, students obtain a basic foundation in mathematics, natural sciences, computing, writing, humanities, arts, and social sciences. The systems and industrial engineering program builds on this foundation, teaching theoretical knowledge, practical skills, and the ability to apply systems thinking to problems. Teamwork, collaborative learning, analytical skills, practical problem solving, and oral and written communication are strongly stressed. Our nationally recognized program in systems and industrial engineering at George Mason University prepares students for immediate employment and provides a foundation for a lifetime of learning.
- Qualified undergraduate students may apply for a five-year accelerated BS/MS program leading to a Bachelor of Science in an engineering discipline and a Master's of Science in an area such as Systems Engineering, Operations Research, or Data Analytics Engineering. The accelerated BS/MS program can be completed in a minimum of 141 credit hours with certain concentrations in the graduate program.