ADVANCE
A NOVA | MASON PARTNERSHIP

A.S. Engineering /
B.S. Systems and Industrial Engineering
Pathway
2025-2026

A.S. Engineering

ADVANCE Program Milestones

ADVANCE Milestone Requirements: All ADVANCE students must adhere to the following requirements. For Milestones #1-#3, failure to meet these milestones will prevent a student from matriculating to Mason and/or result in termination from ADVANCE. For Milestones #4-#7, failure to meet these milestones may delay matriculation to Mason.

1. Students must graduate with the NOVA degree aligned with their ADVANCE academic pathway within 4 years of being admitted into ADVANCE. Students are highly encouraged to be continuously enrolled at NOVA/Mason to support progress towards degree completion.

2. Students must maintain a minimum 2.5 cumulative GPA at NOVA and must have a minimum 2.5 GPA upon matriculation to Mason.

3. Students who wish to enroll at Mason for the fall semester must apply for NOVA spring graduation by March 1 or summer graduation by June 1. Students who wish to enroll at Mason for the spring semester must apply for NOVA fall graduation by October 1.

4. Students must begin developmental coursework no later than the first semester in ADVANCE at NOVA.

5. Students must take first college-level MTH course and ENG 111 in the semester immediately following the completion of any MDE or EDE courses (excluding summer).

6. In the first 30 credits, students must complete ENG 111 and ENG 112 with a C or better.

7. Students must complete a college level math course with a C or better no later than one semester before NOVA graduation. Refer to your pathway to select the appropriate MTH course(s).

ADVANCE Program-Specific Requirements: All ADVANCE students in this degree program must adhere to the following requirements prior to matriculation. Failure to do so may prevent a student from matriculating into this program at Mason or progressing in coursework at Mason.

1. Engineering students must begin the calculus sequence within the first 30 credits and complete Calculus I and II with a C or better.

	NOVA DEGREE REQUIREMENT	Credits	Courses	MASON TRANSFER EQUIVALENT	MASON CORE/DEGREE EQUIVALENT
1	**SDV Course**	1	SDV 100 College Success Skills **OR** SDV 101 Orientation to Engineering	UNIV 100	General Elective
2	**ENG 111**	3	ENG 111 College Composition I[1]	ENGH XXX	General Elective
3	**EGR 121**	2	EGR 121 Foundations of Engineering	ENGR 107	Major
4	**MTH 263**	4	MTH 263 Calculus I	MATH 113	Major & Quantitative
5	**ECO 202**	3	ECO 202 Principles of Microeconomics	ECON 103	Major & Soc/Behav
6	**HIS Course**	3	HIS 101 Western Civilizations Pre-1600 CE **OR** HIS 102 Western Civilizations Post-1600 CE **OR** HIS 112 World Civilizations Post-1500 CE ***(recommended)***	HIST 101T HIST 102T HIST 125	Global History
7	**Technical Elective #1**	4	EGR 125 Introduction to Computer Programming for Engineers	ENGR 125T	Major & Info Tech
8	**PHY 241 Required** ***(NOVA Catalog: Lab Science #1)***	4	PHY 241 University Physics I	PHYS 160-161	Major & Nat Science
9	**ENG 112**	3	ENG 112 College Composition II[1]	ENGH 101	Written Comm
10	**MTH 264**	4	MTH 264 Calculus II	MATH 114	Major
11	**Humanities/Fine Arts #1**	3	ART 100 Art Appreciation **OR** ART 101 History of Art: Prehistoric to Gothic **OR** ART 102 History of Art: Renaissance to Modern **OR** CST 130 Introduction to Theatre **OR** CST 151 Film Appreciation I **OR** MUS 121 Music in Society	ARTH 101 ARTH 200 ARTH 201 THR 101 ENGH L372 MUSI 101	Arts
12	**MTH 265 Required** ***(NOVA Catalog: MTH 265, MTH 266, or MTH 288)***	4	MTH 265 Calculus III	MATH 213	Major

13	**PHY 242 Required** ***(NOVA Catalog: Lab Science #2)***	4	PHY 242 University Physics II	PHYS 260-261	Major & Nat Science
14	**Technical Elective #2**	3	SYST 101 Understanding Systems and Industrial Engineering	SYST 101	Major
15	**Technical Elective #3**	3	SYST 210 Systems Design ***(Fall Only)***	SYST 210	Major
16	**MTH 267**	3	MTH 267 Differential Equations	MATH 214	Major
17	**Technical Elective #4**	3	MTH 266 Linear Algebra	MATH 203	Major
18	**Technical Elective #5**	4	SYST 230 Object-Oriented Modeling and Design[2] **OR** SYST 220 Dynamical Systems[2] **AND** SYST 221 Systems Modeling Lab	SYST 230 SYST 220 SYST 221	Major
19	**Technical Elective #6**	3	CST 100 Principles of Public Speaking OR CST 110 Introduction to Human Communication	COMM 100 COMM 101	Major & Oral Comm
20	**Humanities/Fine Arts #2**	3	ENG 225 Reading Literature: Culture and Ideas **OR** ENG 245 British Literature **OR** ENG 246 American Literature **OR** ENG 255 World Literature **OR** ENG 258 African American Literature **OR** ENG 275 Women in Literature **OR** Any 200-Level ENG Literature course[3]	ENGH 202 or FRLN L330 (ENG 255 only)	Literature
21	**Technical Elective #7**	3	EGR 206 Engineering Economy[4]	SYST L375	Major
A. S. ENGINEERING DEGREE TOTAL		**67**			

For academic policies and procedures, please see NOVA catalog - http://www.nvcc.edu/catalog/index.html

B.S. Systems and Industrial Engineering

Students must choose one of the following technical emphases:

Artificial Intelligence for Systems and Industrial Engineering; Aviation Systems; Bioengineering; Climate Change, Energy, and Sustainability; Computer Network Systems; Cybersecurity Engineering; Data Analytics and Operations Research; Electrical Engineering; Environmental Engineering; Financial Engineering; General Electives; Mechanical Engineering; Software-Intensive Systems

	MASON DEGREE REQUIREMENT	Credits	Course	MASON CORE/DEGREE EQUIVALENT
22	**Technical Emphasis Areas**	4	Technical Elective[5]	Major
23	**Mathematics and Statistics**	3	STAT 344 Probability and Statistics for Engineers	Major
24	**Gen Ed: Written Communication (Upper Level)**	3	ENGH 302 Advanced Composition (Natural Science or Multidisciplinary Section)	Written Comm
25	**Technical Emphasis Areas**	3	Technical Elective[5]	Major
26	**Systems Engineering**	4	SYST 230 Object-Oriented Modeling and Design **OR** SYST 220 Dynamical Systems I **AND** SYST 221 Systems Modeling Laboratory	Major
27	**Systems Engineering**	3	SYST 330 Systems Methods	Major
28	**Systems Engineering**	3	SYST 335 Discrete Systems Modeling & Simulation	Major
29	**Systems Engineering**	3	SYST 371 Systems Engineering Management	Major
30	**Systems Engineering**	3	SYST 395 Applied Systems and Industrial Engineering	Major
31	**Systems Engineering**	3	SYST 320 Dynamical Systems II	Major
32	**Systems Engineering**	3	SYST 470 Human Factors Engineering	Major
33	**Systems Engineering**	3	SYST 473 Decision and Risk Analysis	Major
34	**Systems Engineering**	3	SYST 489 Senior Seminar	Writing Intensive
35	**Systems Engineering**	3	SYST 490 Senior Design Project I	Major
36	**Systems Engineering**	3	OR 441 Deterministic Optimization	Major

37	**Gen Ed: Apex/Systems Engineering**	3	SYST 495 Senior Design Project II	Apex
38	**Systems Engineering**	3	OR 442 Stochastic Models	Major
39	**Mathematics and Statistics**	3	STAT 354 Probability & Statistics for Engrs & Scientists II	Major
40	**Systems Engineering**	3	SYST 475 Production Systems Analysis	Major
B.S. SYSTEMS & INDUSTRIAL ENGINEERING DEGREE TOTAL		**126**		

Denotes a course that must be taken at George Mason University while attending NOVA. Failure to complete your co-enrollment course(s) while attending NOVA can significantly affect your timeline for Mason graduation. Please see your ADVANCE Coach for more information and to enroll.

Important Academic Information:

[1]Students who complete ENG 111 after Spring 2024 will earn ENGH elective for ENG 111 and ENGH 101 for ENG 112.

[2]Students may select either SYST 230 or SYST 220 AND SYST 221. SYST 230 requires EGR 125 as a prerequisite and SYST 210 as a co-requisite. SYST 220 requires MTH 264 and PHYS 241 as prerequisites and MTH 266 as a co-requisite. Students may need to contact seor@gmu.edu for a prerequisite override in order to enroll.

[3]200-level ENG literature classes include: ENG 225, ENG 230, ENG 236, ENG 237, ENG 245, ENG 246, ENG 250, ENG 255, ENG 256, ENG 257, ENG 258, ENG 271, ENG 275, and ENG 279.

[4]Previous pathways in prior agreement years recommended CHM 111, but it is no longer needed. EGR 206 (3 credits) is now recommended as it will fulfill the SYST L375 requirement. EGR 206 (2 credits) is not sufficient to fulfill SYST L375.

[5]For approved Technical Electives, please visit - https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/systems-industrial-engineering-bs/#requirementstext

General Education Waiver Policy and Guidance:

• Students who complete a VCCS transfer associate degree (AS, AA, or AFA) will receive a waiver of the Foundation and Exploration (lower division) Mason Core general education categories, which can be found here: https://catalog.gmu.edu/mason-core/ . 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.

• When a course fulfills a Mason Core requirement **and** a major or college requirement (e.g. Major & Quant), students must complete the course listed on the pathway to fulfill the major/college requirement. Courses that fulfill only Mason Core Foundation and Exploration categories are recommendations. In most pathways, ADVANCE students must complete a Quantitative Reasoning course to matriculate through ADVANCE.

• ADVANCE students must complete the associate degree indicated on their pathway (see the ADVANCE Program Milestones listed above). Students who withdraw from ADVANCE and transfer without the associate degree or UCGS are required to complete each Mason Core general education category.

Additional General Notes & Resources:

• Students in the Systems and Industrial Engineering, BS program must complete all mathematics, science, and College of Engineering and Computing (CEC) courses with a grade of C or better. However, students may apply for one-time grade waiver for no more than one mathematics, science, or CEC course completed at Mason with grade of C- or D. Students must also complete any course required by the program that is a prerequisite to another course applicable to the degree with a grade of C or better.

• For academic policies and procedures, please see Mason catalog - https://catalog.gmu.edu/policies/

• Students seeking a bachelor's degree must apply at least 45 credits of upper-level courses (numbered 300 or above) toward graduation requirements.