

ADVANCE

A NOVA | MASON PARTNERSHIP

A.S. Engineering /
B.S. Systems and Industrial Engineering
Pathway
2023-2024

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 complete their NOVA degree 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 Mason Core Quantitative Reasoning course equivalent 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 B 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 101 | Written Comm |
| 3 | MTH 263 | 4 | MTH 263 Calculus I | MATH 113 | Quantitative |
| 4 | CHM 111 Required (NOVA Catalog: Lab Science #1) | 4 | CHM 111 General Chemistry I | CHEM 211/213 | Major |
| 5 | ECO 202 | 3 | ECO 202 Principles of Microeconomics | ECON 103 | Soc/Behav & Major |
| 6 | EGR 121 | 2 | EGR 121 Foundations of Engineering | ENGR 107 | Major |
| 7 | ENG 112 | 3 | ENG 112 College Composition II ¹ | ENGH XXX | General Elective |
| 8 | MTH 264 | 4 | MTH 264 Calculus II | MATH 114 | Major |
| 9 | PHY 241 Required (NOVA Catalog: Lab Science #2) | 4 | PHY 241 University Physics I | PHYS 160-161 | Nat Science |
| 10 | Technical Elective #1 | 4 | EGR 125 Introduction to Computer Programming for Engineers | ENGR 125T | Info Tech |
| 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 | Technical Elective #2 | 4 | PHY 242 University Physics II | PHYS 260-261 | Nat Science |
| 13 | Technical Elective #3 | 3 | SYST 101 Understanding Systems Engineering | SYST 101 | Major |
| 14 | Technical Elective #4 | 3 | SYST 210 Systems Design (Fall Only) | SYST 210 | Major |
| 15 | MTH 265 | 4 | MTH 265 Calculus III | MATH 213 | Major |
| 16 | MTH 267 | 3 | MTH 267 Differential Equations | MATH 214 | Major |

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|----|-------------------------|---|--|--|-------------------|
| 17 | 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 (<i>recommended</i>) | HIST 101 HIST 102 HIST 125 | Global History |
| 18 | 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 ² | ENGH 202 or FRLN L330 (ENG 255 only) | Literature |
| 19 | Technical Elective #5 | 3 | MTH 266 Linear Algebra | MATH 203 | Major |
| 20 | Technical Elective #6 | 4 | SYST 230 Object-Oriented Modeling and Design | SYST 230 | Major |
| 21 | Technical Elective #7 | 3 | CST 100 Principles of Public Speaking OR CST 110 Introduction to Human Communication | COMM 100 COMM 101 | Oral Comm & Major |

A. S. ENGINEERING DEGREE
TOTAL 68

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:

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

| | MASON DEGREE REQUIREMENT | Credits | Course | | MASON CORE/DEGREE EQUIVALENT |
|----|---|---------|---|--|------------------------------|
| 22 | Systems Engineering | 4 | SYST 220 Dynamical Systems I AND SYST 221 Systems Modeling Laboratory | | Major |
| 23 | Gen Ed: Global Understanding | 3 | Approved Global Understanding course ³ | | Global Understanding |
| 24 | Mathematics and Statistics | 3 | STAT 344 Probability and Statistics for Engineers | | Major |
| 25 | Systems Engineering | 3 | SYST 320 Dynamical Systems II | | Major |
| 26 | Systems Engineering | 3 | OR 441 Deterministic Operations Research | | Major |
| 27 | Gen Ed: Written Communication (Upper Level) | 3 | ENGH 302 Advanced Composition (Natural Science Section) | | Written Comm |
| 28 | Technical Emphasis Areas | 3 | Technical Elective ⁴ | | Major |
| 29 | Mathematics and Statistics | 3 | STAT 354 Probability & Statistics for Engrs & Scientists II | | Major |
| 30 | Systems Engineering | 3 | SYST 330 Systems Methods | | Major |
| 31 | Systems Engineering | 3 | SYST 335 Discrete Systems Modeling & Simulation | | Major |
| 32 | Systems Engineering | 3 | SYST 371 Systems Engineering Management | | Major |
| 33 | Systems Engineering | 3 | SYST 395 Applied Systems Engineering | | Major |
| 34 | Systems Engineering | 3 | SYST 470 Human Factors Engineering | | Major |
| 35 | Systems Engineering | 3 | SYST 473 Decision and Risk Analysis | | Major |
| 36 | Systems Engineering | 3 | SYST 489 Senior Seminar | | Writing Intensive |
| 37 | Systems Engineering | 3 | SYST 490 Senior Design Project I | | Major |
| 38 | Technical Emphasis Areas | 3 | Technical Elective ⁴ | | Major |
| 39 | Gen Ed: Synthesis/Systems Engineering | 3 | SYST 495 Senior Design Project II | | Synthesis |
| 40 | Systems Engineering | 3 | OR 442 Stochastic Operations Research | | Major |
| 41 | Technical Emphasis Areas | 3 | Technical Elective ⁴ | | Major |

B.S. SYSTEMS & INDUSTRIAL ENGINEERING DEGREE TOTAL 129

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:

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

²200-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.

³For approved Mason Core courses, please visit - <https://catalog.gmu.edu/mason-core/>. Students with a completed AS, AA, or AFA degree are eligible for a waiver of the Foundation and Exploration (lower division) Mason Core general education categories and do not need this course. Please see your ADVANCE Coach for more information.

⁴For approved Technical Electives, please visit - <https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/systems-operations-research/systems-engineering-bs/>

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.
- Students who complete a VCCS transfer associate degree (AS, AA, & 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.
- 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.