ADVANCE
A NOVA | MASON PARTNERSHIP

A.S. Engineering /
B.S. Cyber Security 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**<br>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 | **Technical Elective #1** | 3 | CSC 221 Introduction to Problem Solving and Programming | CS XXX | Prerequisite |
| 5 | **ECO 202** | 3 | ECO 202 Principles of Microeconomics | ECON 103 | Soc/Behav |
| 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**<br>***(NOVA Catalog: Lab Science #1)*** | 4 | PHY 241 University Physics I | PHYS 160-161 | Nat Science |
| 10 | **Technical Elective #2** | 3 | CYSE 101 Intro to Cyber Security Engineering[2] | CYSE 101 | Major |
| 11 | **Humanities/Fine Arts #1** | 3 | ART 100 Art Appreciation **OR**<br>ART 101 History of Art: Prehistoric to Gothic **OR**<br>ART 102 History of Art: Renaissance to Modern **OR**<br>CST 130 Introduction to Theatre **OR**<br>CST 151 Film Appreciation I **OR**<br>MUS 121 Music in Society | ARTH 101<br>ARTH 200<br>ARTH 201<br>THR 101<br>ENGH L372<br>MUSI 101 | Arts |
| 12 | **PHY 242 Required**<br>***(NOVA Catalog: Lab Science #2)*** | 4 | PHY 242 University Physics II | PHYS 260-261 | Nat Science |
| 13 | **Technical Elective #3** | 4 | CSC 222 Object-Oriented Programming | CS 112 | Info Tech |
| 14 | **MTH 265** | 4 | MTH 265 Calculus III | MATH 213 | Major |
| 15 | **Technical Elective #4** | 3 | MTH 266 Linear Algebra | MATH 203 | Major |
| 16 | **HIS Course** | 3 | HIS 101 Western Civilizations Pre-1600 CE **OR**<br>HIS 102 Western Civilizations Post-1600 CE **OR**<br>HIS 112 World Civilizations Post-1500 CE ***(recommended)*** | HIST 101<br>HIST 102<br>HIST 125 | Global History |

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|---|---|---|---|---|---|
| 17 | **Humanities/Fine Arts #2** | 3 | ENG 225 Reading Literature: Culture and Ideas **OR**<br>ENG 245 British Literature **OR**<br>ENG 246 American Literature **OR**<br>ENG 255 World Literature **OR**<br>ENG 258 African American Literature **OR**<br>ENG 275 Women in Literature **OR**<br>Any 200-Level ENG Literature course[3] | ENGH 202 or FRLN L330 (ENG 255 only | Literature |
| 18 | **MTH 267** | 3 | MTH 267 Differential Equations | MATH 214 | Major |
| 19 | **Technical Elective #5** | 3 | SYST 205 Systems Engineering Principles | SYST 205 | Major |
| 20 | **Technical Elective #6** | 3 | MTH 288 Discrete Mathematics | MATH 125 | Major |
| 21 | **Technical Elective #7** | 4 | EGR 270 Fundamentals of Computer Engineering[4] | ECE 231-232 | 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. Cyber Security Engineering

| | MASON DEGREE REQUIREMENT | Credits | Course | MASON CORE/DEGREE EQUIVALENT |
|---|---|---|---|---|
| 22 | **Mathematics and Statistics** | 3 | STAT 344 Probability and Statistics for Engineers | Major |
| 23 | **Gen Ed: Oral Communication and Major Requirement** | 3 | COMM 100 Public Speaking **OR**<br>COMM 101 Fundamentals of Communication | Oral Comm & Major |
| 24 | **Computing** | 3 | CS 222 Computer Programming for Engineers | Major |
| 25 | **Cyber Security Engineering Core** | 3 | CYSE 211 Operating Systems & Lab[2] | Major |
| 26 | **Computing** | 4 | SYST 230 Object-Oriented Modeling and Design | Major |
| 27 | **Cyber Security Engineering Core** | 3 | CYSE 230 Computer Networking | Major |
| 28 | **Cyber Security Engineering Core** | 3 | CYSE 130 Introduction to Computing for Digital Systems Engineering | Major |
| 29 | **Gen Ed: Written Communication (Upper-level)** | 3 | ENGH 302 Advanced Composition (Natural Science Section) | Written Comm |
| 30 | **Cyber Security Engineering Core** | 3 | CYSE 425 Secure RF Communications | Major |
| 31 | **Gen Ed: Global Understanding** | 3 | Approved Global Understanding course[5] | Global Understanding |
| 32 | **Cyber Security Engineering Core** | 3 | CYSE 411 Secure Software Engineering | Major |
| 33 | **Cyber Security Engineering Core** | 3 | CYSE 421 Industrial Control Systems (ICS) Security | Major |
| 34 | **Cyber Security Engineering Core** | 3 | CYSE 430 Critical Infrastructure Protection | Major |
| 35 | **Cyber Security Engineering Core** | 3 | CYSE 470 Human Factors and Cyber Security Engineering | Major |
| 36 | **Cyber Security Engineering Core** | 4 | CYSE 445 Systems Security and Resilience **AND**<br>CYSE 450 Cyber Vulnerability Lab | Major |
| 37 | **Cyber Security Engineering Core** | 3 | CYSE 476 Cryptography Fundamentals | Major |
| 38 | **Cyber Security Engineering Core - Technical Electives** | 3 | Technical Elective[6] | Major |
| 39 | **Cyber Security Engineering Core** | 3 | CYSE 492 Senior Advance Design Project I | Major |
| 40 | **Cyber Security Engineering Core** | 3 | CYSE 491 Engineering Senior Seminar | Writing Intensive |
| 41 | **Gen Ed: Synthesis/Cyber Security Engineering Core** | 3 | CYSE 493 Senior Advanced Design Project II | Synthesis |
| 42 | **Cyber Security Engineering Core - Technical Electives** | 3 | Technical Elective[6] | Major |

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|---|---|---|---|---|
| **43** | **Cyber Security Engineering Core - Technical Electives** | 3 | Technical Elective[6] | Major |
| **B.S. CYBER SECURITY ENGINEERING DEGREE TOTAL** | **135** | | | |

**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]CYSE courses are only offered once a year, see Mason academic advisor to create an academic plan.

[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]ECE 231 + ECE 232 will fulfill the ECE 301 requirement in the Cybersecurity Engineering, BS for transfer students only.

[5]For 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.

[6]For approved Technical Elective courses, please visit - https://catalog.gmu.edu/colleges-schools/engineering-computing/engineering/cyber-security-engineering/cyber-security-engineering-bs/#requirementstext

**Additional General Notes & Resources:**

- 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.