BACHELOR OF SCIENCE WITH A MAJOR IN MECHANICAL ENGINEERING, AEROSPACE OPTION

Mechanical engineering encompasses a vast range of industrial activities. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of complex systems. Applications include aerospace, energy conversion, computer-aided design and manufacturing, power and propulsion systems, robotics, and control systems. The bachelor of science with a major in mechanical engineering, aerospace option degree program prepares students to work in the aerospace industry or to pursue graduate study in aerospace engineering. It provides a strong foundation in aerodynamics, airplane performance, propulsion, aerospace structures, orbital mechanics, spacecraft dynamics, and aircraft and spacecraft design. The mechanical engineering (ME) program is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).

Double major

SEAS and non-SEAS students interested in pursuing the BS in mechanical engineering as a double major should see Double Major under SEAS Regulations (http://bulletin.gwu.edu/engineering-applied-science/#seasregulationstext) in this Bulletin.

Visit the program website (https://www.mae.seas.gwu.edu/programs-degrees/) for more information.

REQUIREMENTS

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<th>Credits</th>
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<td><strong>Recommended program of study</strong></td>
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| First semester                                                                                       |
|-------|-------------------------------------------------|
| CHEM 1111 | General Chemistry I \(^1\)                     |
| or CHEM 1113 | General Chemistry for Engineers            |
| MAE 1001 | Introduction to Mechanical and Aerospace Engineering                                      |
| MATH 1231 | Single-Variable Calculus I \(^1\)            |
| SEAS 1001 | Engineering Orientation                          |
| UW 1020  | University Writing \(^1\)                      |
| H/SS 1 \(^2\) |                                                 |

| Second semester                                                                                       |
|-------|-------------------------------------------------|
| MAE 1004 | Engineering Drawing and Computer Graphics            |
| MAE 1117 | Introduction to Engineering Computations            |
| MATH 2184 | Linear Algebra I                                     |
| PHYS 1021 | University Physics I \(^1\)                      |
| H/SS 2 \(^2\) |                                                 |

| Third semester                                                                                       |
|-------|-------------------------------------------------|
| APSC 2057 | Analytical Mechanics I                         |
| APSC 2113 | Engineering Analysis I                        |
| MAE 2117 | Engineering Computations                       |
| MAE 3192 | Manufacturing Processes and Systems (Humanities or Social Sciences Elective) |
| MATH 2233 | Multivariable Calculus \(^1\)                  |

| Fourth semester                                                                                       |
|-------|-------------------------------------------------|
| APSC 2058 | Analytical Mechanics II                        |
| APSC 3115 | Engineering Analysis III                       |
| CE 2220  | Introduction to the Mechanics of Solids        |
| MAE 2131 | Thermodynamics                                  |
| PHYS 1022 | University Physics II                          |

| Fifth semester                                                                                       |
|-------|-------------------------------------------------|
| MAE 3126 | Fluid Mechanics I                               |
| MAE 3127 | Fluid Mechanics Lab                             |
| MAE 3166W | Materials Science and Engineering               |
| MAE 3191 | Mechanical Design of Machine Elements          |
| MAE 3119 | Electronics and Devices for Mechanical Engineers |
| Aero elective                                                                                       |

| Sixth semester                                                                                       |
|-------|-------------------------------------------------|
| MAE 3120 | Methods of Engineering Experimentation        |
| MAE 3134 | Linear System Dynamics                         |
| MAE 3155 | Aerodynamics                                    |
| MAE 3167W | Mechanics of Materials Lab                     |
| MAE 3187 | Heat Transfer                                   |
| MAE 3193 | Mechanical Systems Design                      |

| Seventh semester                                                                                      |

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Bachelor of Science with a Major in Mechanical Engineering, Aerospace Option
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<td>MAE 4151</td>
<td>Capstone Design Project I</td>
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<td>MAE 4157</td>
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<td>MAE 4182</td>
<td>Electromechanical Control System Design</td>
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<td>MAE 4152W</td>
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<td>MAE 6229</td>
<td>Propulsion</td>
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<td>H/SS 5</td>
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<td>H/SS 6</td>
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1 Course satisfies the University General Education Requirement [here](http://bulletin.gwu.edu/university-regulations/general-education/) in quantitative reasoning, scientific reasoning, and written communication.

2 To satisfy the SEAS humanities and social science requirement, all mechanical engineering students must take one (1) humanities course and two (2) social sciences courses from the University General Education Requirement [here](http://bulletin.gwu.edu/university-regulations/general-education/); PHIL 2135; and two (2) additional humanities, social science, or non-technical courses from the MAE Department’s pre-approved list of electives. Each course selected to satisfy this requirement must be taken for at least 3 credits. NOTE: Students in the patent law concentration must take MAE 2170 in lieu of one of the additional humanities or social science or non-technical course.

3 Space: Students take MAE 3145 in the fifth semester and MAE 6249 in the eighth semester.

Aero: Students take MAE 4163 in the seventh semester and MAE 6247 in the eighth semester.

4 All technical electives must be approved by the undergraduate advisor. On a case-by-case basis, technical electives may be chosen from other departments if approved by both the undergraduate advisor and the department chair. Technical electives are chosen from MAE courses in the 3000, 4000, and 6000 series, excluding: MAE 3171, MAE 4172, MAE 6298, MAE 6998, and MAE 6999.

Visit the program website [here](http://www.mae.seas.gwu.edu/programs-degrees/) for additional information.