AEROSPACE ENGINEERING - BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING

The aerospace engineering program prepares students for a range of professional engineering careers in aerospace and related professions. The aerospace engineering curriculum covers the important classical areas of low and high speed aerodynamics, propulsion, orbital mechanics, flight mechanics and control, aerospace structures and laboratory practice. In addition, the principles of systems engineering and design that are necessary to conceive, design, analyze and troubleshoot complex engineering systems are covered extensively and are considered to be especially important in the overall educational experience. Students will also be encouraged to participate in significant non-classroom experiences, including:

- co-ops and internships;
- industrial and laboratory field trips;
- guest speakers from outside NMSU;
- the New Mexico Space Grant Program;
- special seminar programs on current topics in aerospace.

Aerospace engineers find employment in areas of launch vehicles, space vehicles and missions, aircraft systems design, land and sea vehicle design, robotics and automated manufacturing, safety and other areas. The aerospace engineering background also allows graduates to pursue careers in non-aerospace fields of engineering. Graduates of the aerospace engineering program will be prepared to apply the following skills to problems of interest either in the industry or research and development:

- engineering sciences,
- mathematics,
- computational methods,
- modern experimental methods,
- effective communication skills and
- systems engineering principles.

The aerospace engineering program is also intended to prepare students to pursue graduate study, which can be of significant benefit in the aerospace profession. The general goals of the aerospace engineering program, as well as the program educational objectives, are the same as those stated above for the mechanical engineering program.

Requirements (120 Credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science, and engineering courses applied toward their BSAE and/or ME minor.

### General Education

#### Area I: Communications

- **English Composition - Level 1**
- **ENGL 111G** Rhetoric and Composition 4
- **English Composition - Level 2** 3
- **Oral Communication** 3

#### Area II: Mathematics

- **MATH 191G** Calculus and Analytic Geometry I 4
- **Area III/IV: Laboratory Sciences & Social/Behavioral Sciences**
- **CHEM 111G** General Chemistry I 4
- **PHYS 215G** Engineering Physics I & 215GL and Engineering Physics I Laboratory 4
- **Area IV: Social/Behavioral Sciences** 3
- **Areas V: Humanities** 3
- **Area VI: Creative and Fine Arts** 3

#### General Education Elective

- **MATH 192G** Calculus and Analytic Geometry II 4

### Viewing a Wider World

- **Viewing a Wider World**
- **Viewing a Wider World Elective** 3
- **PHYS 303V** Energy and Society in the New Millennium 3

### Departmental/College Requirements

#### Mechanical Engineering

- **M E 159** Graphical Communication and Design 2
- **M E 210** Electronics and System Engineering 3
- **M E 222** Introduction to Product Development 3
- **M E 228** Engineering Analysis I 3
- **M E 236** Engineering Mechanics I 3
- **M E 237** Engineering Mechanics II 3
- **M E 240** Thermodynamics 3
- **M E 261** Mechanical Engineering Problem Solving 3
- **M E 328** Engineering Analysis II 3
- **M E 341** Heat Transfer 3
- **M E 345** Experimental Methods I 3
- **M E 349** MAE Career Seminar 1

#### Aerospace Engineering

- **A E 339** Aerodynamics I 3
- **A E 362** Orbital Mechanics 3
- **A E 363** Aerospace Structures 3
- **A E 364** Flight Dynamics and Controls 3
- **A E 419** Propulsion 3
- **A E 439** Aerodynamics II 3
- **A E 424** Aerospace Systems Engineering 3
- **A E 428** Aerospace Capstone Design 3
- **A E 447** Aerofluids Laboratory 3

Aerospace engineering senior elective (Approved M E 400 level and/or A E 400 level courses only) 3

### Non-Departmental Requirements

#### Mathematics

- **MATH 291G** Calculus and Analytic Geometry III 3

#### Natural Science

- **PHYS 216G** Engineering Physics II 3
## Engineering

### ENGR 100
Introduction to Engineering 3

### C E 301
Mechanics of Materials 3

### CHME 361
Engineering Materials 3

### Second Language: (not required)

### Electives, to bring the total credits to 120

### Total Credits
120

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1. See General Education (http://catalogs.nmsu.edu/nmsu/essential-information-students/general-education-courses/#nmcommoncoretext) section in this catalog for a full list of courses.
2. MATH 191G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 191G first.
3. See the Viewing a Wider World (http://catalogs.nmsu.edu/nmsu/essential-information-students/general-education-courses/#viewingawiderworldtext) section in this catalog for a full list of courses.
4. Courses subject to once per year rotation.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

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### A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 191G Calculus and Analytic Geometry I and ENGL 111G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 191G</td>
<td>Calculus and Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>M E 159</td>
<td>Graphical Communication and Design</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 111G</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 111G</td>
<td>Rhetoric and Composition</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

| **Spring** | | |
| MATH 192G | Calculus and Analytic Geometry II | 4 |
| PHYS 215G | Engineering Physics I | 3 |
| PHYS 215GL | Engineering Physics I Laboratory | 1 |
| M E 222 | Introduction to Product Development | 3 |
| *English Composition - Level 2* | | 3 |
| **Total Credits** | | 14 |

| **Fall** | | |
| MATH 291G | Calculus and Analytic Geometry III | 3 |
| PHYS 216G | Engineering Physics II | 3 |

| **Senior** | | |
| CHME 361 | Engineering Materials | 3 |
| A E 419 | Propulsion | 3 |
| A E 447 | Aerofluids Laboratory | 3 |
| *Area V: Humanities* | | 3 |
| *Area VI: Creative and Fine Arts* | | 3 |
| **Total Credits** | | 13 |

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See the Viewing a Wider World section in this catalog for a full list of courses.

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