

# BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING

Aerospace engineering explores both the design and manufacture of aircraft, as well as the design and flight of vehicles beyond the earth's atmosphere. Knowledge of aerodynamics, structures and materials, propulsion systems, and flight mechanics and controls are important to this field.

Aerospace engineers are primarily employed in civil aeronautics, the defense industry, and the space program. However, applications of aerospace technology are also found in related areas such as ground and undersea transportation systems, pollution control, wind power and the effects of wind on structures, and the development and use of advanced materials.

## Required Courses

| Code  | Title  | Credit Hours |
|---|--|--------------|
| <b>Aerospace Engineering Requirements</b>           |  | <b>(56)</b>  |
| MMAE 100  | Introduction to the Profession                     | 3            |
| MMAE 202  | Mechanics of Solids                                | 3            |
| MMAE 304  | Mechanics of Aerostructures                        | 3            |
| MMAE 305  | Dynamics   | 3            |
| MMAE 311  | Compressible Flow                                  | 3            |
| MMAE 312  | Aerodynamics of Aerospace Vehicles                 | 3            |
| MMAE 313  | Fluid Mechanics                                    | 3            |
| MMAE 315  | Aerospace Laboratory I                             | 4            |
| MMAE 320  | Thermodynamics                                     | 3            |
| MMAE 350  | Computational Mechanics                            | 3            |
| MMAE 352  | Aerospace Propulsion                               | 3            |
| MMAE 372  | Aerospace Materials Lab                            | 3            |
| MMAE 410  | Aircraft Flight Mechanics                          | 3            |
| MMAE 411  | Spacecraft Dynamics                                | 3            |
| MMAE 412  | Spacecraft Design I                                | 3            |
| MMAE 414  | Aircraft Design I                                  | 3            |
| MMAE 415  | Aerospace Laboratory II                            | 4            |
| MMAE 443  | Systems Analysis and Control                       | 3            |
| <b>Materials Science Requirement</b>                |  | <b>(3)</b>   |
| MS 201  | Materials Science                                  | 3            |
| <b>Mathematics Requirements</b>                     |  | <b>(18)</b>  |
| MATH 151  | Calculus I   | 5            |
| MATH 152  | Calculus II  | 5            |
| MATH 251  | Multivariate and Vector Calculus                   | 4            |
| MATH 252  | Introduction to Differential Equations             | 4            |
| <b>Physics Requirements</b>                         |  | <b>(8)</b>   |
| PHYS 123  | General Physics I: Mechanics                       | 4            |
| PHYS 221  | General Physics II: Electricity and Magnetism      | 4            |
| <b>Chemistry Requirement</b>                        |  | <b>(4)</b>   |
| CHEM 124  | Principles of Chemistry I with Laboratory          | 4            |
| <b>Computer Science Requirement</b>                 |  | <b>(2)</b>   |
| CS 104  | Introduction to Computer Programming for Engineers | 2            |
| <b>Interprofessional Project (IPRO)</b>             |  | <b>(6)</b>   |
| See Illinois Tech Core Curriculum, section E        |  | 6            |
| <b>Humanities and Social Sciences Requirements</b>  |  | <b>(21)</b>  |
| See Illinois Tech Core Curriculum, sections B and C |  | 21           |
| <b>Technical Electives</b>                          |  | <b>(3)</b>   |
| Select three credit hours <sup>1</sup>              |  | 3            |
| <b>Free Electives</b>                               |  | <b>(6)</b>   |

Select six credit hours

6

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**Total Credit Hours**

**127**

<sup>1</sup> A technical elective is a 300- or higher-level course in any engineering discipline (other than required MMAE courses or their equivalent) or in mathematics, chemistry, physics, or computer science. However, not all such courses are acceptable as technical electives. Students should consult their faculty adviser for a determination of which courses are acceptable. In addition, ECE 218, ECON 423, INTM 437 and INTM 438 are permitted. Any substitutions require written approval by the department.

## Bachelor of Science in Aerospace Engineering Curriculum

|  |              | Year 1                          |              |
|--|--------------|---------------------------------|--------------|
| Semester 1                             | Credit Hours | Semester 2                      | Credit Hours |
| MMAE 100                               | 3            | MS 201                          | 3            |
| MATH 151                               | 5            | MATH 152                        | 5            |
| CHEM 124                               | 4            | PHYS 123                        | 4            |
| Humanities 200-level Course            | 3            | CS 104                          | 2            |
|  |              | Social Sciences Elective        | 3            |
| <b>15</b>                              |              | <b>17</b>                       |              |
|  |              | Year 2                          |              |
| Semester 1                             | Credit Hours | Semester 2                      | Credit Hours |
| MMAE 202                               | 3            | MMAE 313                        | 3            |
| MATH 251                               | 4            | MMAE 320                        | 3            |
| PHYS 221                               | 4            | MATH 252                        | 4            |
| Humanities or Social Sciences Elective | 3            | Free Elective                   | 3            |
| Humanities Elective (300+)             | 3            | Social Sciences Elective (300+) | 3            |
| <b>17</b>                              |              | <b>16</b>                       |              |
|  |              | Year 3                          |              |
| Semester 1                             | Credit Hours | Semester 2                      | Credit Hours |
| MMAE 311                               | 3            | MMAE 304                        | 3            |
| MMAE 312                               | 3            | MMAE 305                        | 3            |
| MMAE 315                               | 4            | MMAE 352                        | 3            |
| MMAE 350                               | 3            | MMAE 372                        | 3            |
| Free Elective                          | 3            | Humanities Elective (300+)      | 3            |
| <b>16</b>                              |              | <b>15</b>                       |              |
|  |              | Year 4                          |              |
| Semester 1                             | Credit Hours | Semester 2                      | Credit Hours |
| MMAE 410                               | 3            | MMAE 412                        | 3            |
| MMAE 411                               | 3            | MMAE 415                        | 4            |
| MMAE 414                               | 3            | I PRO Elective II               | 3            |
| MMAE 443                               | 3            | Technical Elective <sup>1</sup> | 3            |
| I PRO Elective I                       | 3            | Social Sciences Elective (300+) | 3            |
| <b>15</b>                              |              | <b>16</b>                       |              |

**Total Credit Hours: 127**

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This program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).