

# BS in Aerospace Engineering

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## Degree Program Description

The aerospace engineering curriculum provides students a foundation in mathematics, the basic sciences, and engineering. Students take core courses in the four fundamental areas of aerospace engineering: 1) aerodynamics, 2) aerospace structures, 3) aerospace vehicle flight dynamics and control, and 4) aerospace propulsion. These foundational courses are augmented by hands-on laboratories involving instrumentation and measurements, aerospace structures, aerodynamics, and thermal systems. The Bachelor of Science in Aerospace Engineering (BSAE) prepares students for employment in the aircraft or spacecraft industries, government laboratories, or for further study toward other degrees such as the JD, MD, MS, and PhD.

## Major Program Requirements

The BSAE curriculum allows students to transfer to the BSME program and among engineering departments during the first two years. Students concentrate on BSAE requirements at the beginning of the junior year. During the junior and senior years BSAE students will complete required coursework in the foundational areas of aerospace engineering: 1) aerodynamics, 2) flight dynamics and control, 3) aerospace structures, and 4) propulsion. The senior year includes two MAE electives that allow students to focus on specific topics.

Experience in design is distributed throughout the required courses in the curriculum and culminates in a two-course sequence taken in the senior year: Capstone Design 1 and 2. The capstone design experience integrates earlier technical work with economic, safety, ethical, and environmental considerations. Seniors in the BSAE program will have two options for Senior Capstone Design 2: aircraft design or spacecraft design. Here the two capstone sections will mimic the aerospace industry where students will be part of a large team (or "company") with smaller technical branches that focus on aerodynamics, flight mechanics, structures, and propulsion. Thus, the capstone projects will involve "end-to-end" preliminary designs for aircraft and spacecraft each with a wide range of constraints and mission requirements. The presentations of project results are made to a review panel consisting of members of the faculty and the MAE Industrial Advisory Committee (IAC).

In addition to the University general education (<https://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/>) and graduation requirements (<https://catalog.missouri.edu/academicdegreerequirements/universityrequirements/>), the BSAE degree requires the following courses. Total credits hours earned is 126.

CHEM 1400 & CHEM 1401	College Chemistry I and College Chemistry I Laboratory	4
MATH 1500	Analytic Geometry and Calculus I	5
ENGINR 1000	Introduction to Engineering	1
PHYSICS 2750	University Physics I	5
MATH 1700	Calculus II	5

ENGINR 1050	Foundations of Engineering	2
MAE 1100	Introduction to Computer Aided Design	3
PHYSICS 2760	University Physics II	5
MATH 2300	Calculus III	3
ENGINR 1200	Statics and Elementary Strength of Materials	3
ENGINR 2200	Intermediate Strength of Materials	3
STAT 4710	Introduction to Mathematical Statistics	3
MATH 4100	Differential Equations	3
MAE 2100	Programming and Software Tools	3
MAE 2200W	Engineering Materials - Writing Intensive	3
MAE 2300	Thermodynamics	3
MAE 2510	Manufacturing Practice	1
MAE 2600	Dynamics	3
MAE 3100	Computational Methods for Engineering Design	3
MAE 3440	Aerodynamics I: Incompressible Flow	3
MAE 3450	Aerodynamics II: Compressible Flow	3
MAE 3600	Dynamic Systems and Control	3
MAE 3800	Instrumentation and Measurements Laboratory	3
MAE 3820	Structures Laboratory	2
MAE 4210	Aerospace Structures	3
MAE 4390	Aerospace Propulsion	3
MAE 4620	Aircraft Flight Performance	3
MAE 4630	Space Flight Mechanics	3
MAE 4690	Aircraft Flight Dynamics	3
MAE 4840	Aerospace Engineering Laboratory	3
MAE 4970	Senior Capstone Design 1	3
MAE 4980W	Senior Capstone Design - Writing Intensive	3
Technical Elective (Math, Science, or Engineering course 3000-level or higher)		3
MAE Elective 4000-level		3

## Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	CR	Spring	CR
CHEM 1400 & CHEM 1401		4 PHYSICS 2750	5
MATH 1500		5 MATH 1700	5
ENGINR 1000		1 ENGINR 1050	2
ENGLISH 1000		3 MAE 1100	3
US History or Us Government		3	
			<b>15</b>
Second Year			
Fall	CR	Spring	CR
PHYSICS 2760		5 STAT 4710	3
MATH 2300		3 MATH 4100	3
ENGINR 1200		3 ENGINR 2200	3
MAE 2300		3 MAE 2100	3
		MAE 2600	3
			<b>15</b>
			<b>14</b>

Third Year			
Fall	CR	Spring	CR
MAE 3800		3 MAE 4210	3
MAE 2200W		3 MAE 4450	3
MAE 3100		3 MAE 3600	3
MAE 4440		3 MAE 3820	2
MAE 4620		3 MAE 4630	3
Humanities and Fine Arts		3 Humanities and Fine Arts Elective	3
		<b>18</b>	<b>17</b>
Fourth Year			
Fall	CR	Spring	CR
MAE 4840		3 MAE 4980W	3
MAE 4390		3 Technical Elective (Math, Science, or Engineering course 3000-level or higher)	3
MAE 4690		3 MAE Elective 4000-level	3
MAE 4970		3 Behavioral & Social Science Elective	3
ISE 2710		3 Humanities and Fine Arts Elective	3
		<b>15</b>	<b>15</b>

Total Credits: 125

## Degree Audit

The degree audit is an automated report reflecting a student's academic progress toward the completion of a degree.

**MU students can** request a degree audit by logging in to myDegreePlanner (<https://mydegreeplanner.missouri.edu>). Students may also access myDegreePlanner via myZou, in the Student Center, click on the Academic Progress Tile, then select Request Degree Audit. The audit automatically pulls in the student's MU course work, transfer courses and courses in progress. This is available to current students, admitted students, and those who last attended less than three terms ago.

**Past MU students** can request a degree audit by contacting the Academic Advising Unit of the division in which they were last enrolled at MU. For contact information, go to <https://advising.missouri.edu/contact/>.

**Prospective students**, can access a preliminary MU degree audit via <https://www.transferology.com> (<https://www.transferology.com/>). Information on the college credits already earned will have to be manually entered before it can be evaluated against current degree requirements.

For additional details on degree audits, go to <https://registrar.missouri.edu/degrees-audits/degree-audits/>.

## Major and Career Exploration

The University of Missouri has many resources to assist you in exploring majors and career possibilities. For guidance, visit the Majors and Careers (<https://career.missouri.edu/majors-careers/>) website or view specific resources below.

- If you are considering a change of major or are exploring multiple majors, schedule an appointment with an advisor in the Discovery Center (<https://discoverycenter.missouri.edu/>) by calling (573)884-9700 or through MU Connect (<https://mizzou.starfishsolutions.com/starfish-ops/dl/instructor/>

[serviceCatalog.html?bookmark=service/3761489](https://discoverycenter.missouri.edu/serviceCatalog.html?bookmark=service/3761489)) Discovery Center service in you success network.

- If you have decided on a major, visit an academic advisor in the School or College that you are interested in to discuss the process of declaring the major (<https://advising.missouri.edu/majors-minors/changing-major/>).
- If you would like to learn more about your career interests, abilities, values and talents, visit the MU Career Center (<https://career.missouri.edu/connect/>). No Appointment is necessary to explore career options with one of our staff members.
- If you would like information about MU majors and degree programs, visit:
  - the Degrees, Majors (Degree Programs), Emphasis Areas, Minors and Certificates (<https://catalog.missouri.edu/degreesanddegreeprograms/>) page in the catalog,
  - the MU Majors (<https://majors.missouri.edu>) website.

For additional major and career exploration resources, visit Major & Career Exploration (<https://catalog.missouri.edu/majorcareerexploration/>) in the catalog.