

# Department of Aerospace Engineering

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The Department of Aerospace Engineering at Mississippi State University provides an accredited undergraduate curriculum with the mission of preparing students to enter the workplace as qualified entry-level aerospace engineers or to enter any aerospace engineering graduate program adequately prepared for advanced study. This mission is accomplished by a strong foundation in mathematics and physical and engineering sciences upon which student problem-solving and application skills are developed. The curriculum stresses analytical and communication skills, with particular emphasis placed on engineering design throughout the curriculum. A capstone design experience in the senior year provides the opportunity to integrate design, analytical, and problem-solving skills along with communication skills in a team environment that emulates aerospace engineering practice.

The mission is accomplished by the following educational objectives, which describe the career and professional accomplishments we are preparing our graduates to achieve. Our graduates will:

1. Be involved in solving unstructured engineering problems within their organization that will allow them to successfully advance in the engineering profession.
2. Be engaged in lifelong learning and pursue professional development through actions such as persistent study of the current literature in the field, participation in graduate education, professional education or continuing education opportunities, attainment of professional licensure, or membership in professional societies.
3. Be professionally and ethically responsible to the profession, society, and the environment incumbent on an engineering professional.
4. Collaborate successfully and positively on multi-disciplinary, culturally-diverse teams in support of their organizational goals.
5. Communicate effectively in various settings and contexts by activities such as writing technical reports and peer-reviewed articles and presenting at technical interchanges.

These objectives are accomplished in two different concentrations in the aerospace engineering curriculum, an aeronautics concentration and an astronautics concentration. The concentration in aeronautics focuses on the analysis and design of aircraft and other vehicles that operate primarily within the earth's atmosphere, and the concentration in astronautics focuses on the analysis and design of spacecraft and other vehicles that operate primarily outside the earth's atmosphere. A student in aerospace engineering will choose one of these two concentrations upon choosing the aerospace engineering major.

The aerospace engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

## General Education Requirements

### English Composition

EN 1103	English Composition I	3
or EN 1104	Expanded English Composition I	
EN 1113	English Composition II	3
or EN 1173	Accelerated Composition II	

### Mathematics

See Major Core		9
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### Science

See Major Core		6
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### Humanities

See General Education courses		6
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### Fine Arts

See General Education courses		3
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### Social/Behavioral Sciences

See General Education courses		6
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### Major Core

#### Math and Basic Science

MA 1713	Calculus I	3
MA 1723	Calculus II	3
MA 2733	Calculus III	3
MA 2743	Calculus IV	3

MA 3113	Introduction to Linear Algebra	3
MA 3253	Differential Equations I	3
Math/Science Elective <sup>1</sup>		3
CH 1213	Chemistry I	3
CH 1211	Investigations in Chemistry I	1
PH 2213	Physics I	3
PH 2223	Physics II	3
CSE 1233	Computer Programming with C	3
<b>Engineering Topics</b>		
ECE 3413	Introduction to Electronic Circuits	3
EM 2413	Engineering Mechanics I	3
EM 2433	Engineering Mechanics II	3
EM 3213	Mechanics of Materials	3
EM 3313	Fluid Mechanics	3
EM 3413	Vibrations	3
ASE 1013	Introduction to Aerospace Engineering	3
ASE 2013	Astrodynamics, Propulsion and Structures	3
ASE 2113	Introduction to Aircraft and Spacecraft Performance	3
ASE 3233	Aerospace Structural Analysis I	3
ASE 3243	Aerospace Structural Analysis II	3
ASE 3333	Aerothermodynamics	3
ASE 4113	Aerospace Engineering Laboratory I	3
ASE 4123	Aerospace Controls	3
ASE 4343	Compressible Aerodynamics	3
ASE 4623	Aerospace Structural Design	3
ASE 4721	Aerospace Engineering Laboratory II	1
Technical Electives <sup>2</sup>		6
<b>Oral Communication Requirement</b>		
Satisfied by successful completion of ASE 2013, ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4721 and GE 3513.		
<b>Writing Requirement</b>		
GE 3513	Technical Writing	3
<b>Computer Literacy</b>		
Satisfied by successful completion of ASE 1013, ASE 2013, and ASE 2113.		
<b>Choose one of the following concentrations:</b>		<b>15</b>
<b>Aeronautics Concentration (ARO)</b>		
ASE 3123	Aircraft Flight Dynamics	
ASE 3313	Incompressible Aerodynamics	
ASE 4413	Aircraft Propulsion	
ASE 4513	Aircraft Design I	
ASE 4523	Aircraft Design II	
<b>Astronautics Concentration (ASO)</b>		
ASE 3813	Introduction to Orbital Mechanics	
ASE 3823	Spacecraft Attitude Dynamics	
ASE 4443	Spacecraft Propulsion	
ASE 4533	Spacecraft Design I	
ASE 4543	Spacecraft Design II	
<b>Total hours</b>		<b>128</b>

<sup>1</sup> The department maintains a list of pre-approved math/science electives on its website. Other courses may be selected upon approval of the department.

<sup>2</sup> Technical electives may be selected from any of the department's listing of Advanced Undergraduate/Graduate Courses, plus EM 4123, EM 4133 and EM 4143. Other courses may be selected upon approval of the department. All required courses in one concentration qualify as technical electives for students in the other concentration.