

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 B. S. program in Aerospace Engineering is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org>, under the commission's General Criteria and Program Criteria for Aerospace and similarly named engineering programs.

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	

Creative Discovery

Select from General Education courses		3
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Humanities

Select from General Education courses		6
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Social/Behavioral Sciences

Select from General Education courses		6
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Quantitative Reasoning

MA 1713	Calculus I ¹	3
MA 1723	Calculus II ¹	3

Natural Sciences

CH 1213 & CH 1211	Chemistry I and Investigations in Chemistry I	4
PH 2213	Physics I ¹	3
PH 2223	Physics II ¹	0,3

Additional Requirements

MA 2733	Calculus III ¹	3
MA 2743	Calculus IV	3
MA 3113	Introduction to Linear Algebra ¹	3
MA 3253	Differential Equations I ¹	3
Math/Science Elective ²		3
CSE 1233 or CSE 1284	Computer Programming with C Introduction to Computer Programming	3-4

Major Core

ASE 1013	Introduction to Aerospace Engineering	3
ASE 2113	Introduction to Aircraft and Spacecraft Performance	3
ASE 2711	Aerospace Laboratory I	1
ASE 3233	Aerospace Structural Analysis I	3
ASE 3313	Incompressible Aerodynamics	3
ASE 3333	Aerothermodynamics	3
ASE 3721	Aerospace Laboratory II	1
ASE 3731	Aerospace Laboratory III	1
ASE 3813	Introduction to Orbital Mechanics	3
ASE 4123	Aerospace Controls	3
ASE 4313	Introduction to Aerospace Propulsion	3
ASE 4343	Compressible Aerodynamics	3
ASE 4623	Aerospace Structural Design	3
ASE 4712	Aerospace Capstone I	2
ASE 4722	Aerospace Capstone II	2
EG 1143	Graphic Communication	3
EM 2413	Engineering Mechanics I ¹	3
EM 2433	Engineering Mechanics II ¹	3
EM 3213	Mechanics of Materials ¹	3
EM 3313	Fluid Mechanics ¹	3
EM 3413	Vibrations	3

Oral Communication Requirement

Satisfied by successful completion of ASE 4513/ASE 4523 or ASE 4533/ASE 4543, ASE 4623, ASE 4721 and GE 3513.

Writing Requirement

GE 3513	Professional Communication for Engineers	3
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Computer Literacy

Satisfied by successful completion of ASE 1013, ASE 2113, CSE 1233, or CSE 1284

Choose one of the following concentrations: **15**

Aeronautics Concentration (ARO)

ASE 3123	Aircraft Flight Dynamics	
ASE 4513	Aircraft Design I	
ASE 4523	Aircraft Design II	

Technical Electives 6

Choose from:

ASE 3823	Spacecraft Attitude Dynamics	
ASE 4133	Automatic Control of Aerospace Vehicles	
ASE 4153	Advanced Performance	
ASE 4163	Introduction to Flight Test Engineering	
ASE 4223	Structural Anal II	
ASE 4353	Combustion Theory and Modeling	
ASE 4423	Introduction to Computational Fluid Dynamics	
ASE 4433	Fundamentals of Numerical Grid Generation	
ASE 4443	Spacecraft Propulsion	

ASE 4553	Engineering Design Optimization	
ASE 4713	Introduction to Unmanned Aircraft Systems	
ASE 4813	Advanced Orbital Mechanics	
EM 4123	An Introduction to the Finite Element Method	
EM 4133	Mechanics of Composite Materials	
EM 4143	Engineering Design Optimization	
Astronautics Concentration (ASO)		
ASE 3823	Spacecraft Attitude Dynamics	
ASE 4533	Spacecraft Design I	
ASE 4543	Spacecraft Design II	
Technical Electives		6
Choose from:		
ASE 3123	Aircraft Flight Dynamics	
ASE 4133	Automatic Control of Aerospace Vehicles	
ASE 4153	Advanced Performance	
ASE 4163	Introduction to Flight Test Engineering	
ASE 4223	Structural Anal II	
ASE 4353	Combustion Theory and Modeling	
ASE 4413	Aircraft Propulsion	
ASE 4423	Introduction to Computational Fluid Dynamics	
ASE 4433	Fundamentals of Numerical Grid Generation	
ASE 4553	Engineering Design Optimization	
ASE 4553	Engineering Design Optimization	
ASE 4713	Introduction to Unmanned Aircraft Systems	
ASE 4813	Advanced Orbital Mechanics	
EM 4123	An Introduction to the Finite Element Method	
EM 4133	Mechanics of Composite Materials	
EM 4143	Engineering Design Optimization	
Total hours		128

¹ This course requires a minimum grade of C.

² The department maintains a list of pre-approved math/science electives on its website. Other courses may be selected upon approval of the department.