

MAJOR IN MECHANICAL ENGINEERING, AEROSPACE ENGINEERING CONCENTRATION

Aerospace engineering covers the design, construction, and science of aircraft and spacecraft. Designed for undergraduate mechanical

engineering majors, the aerospace concentration offers students a mechanical engineering degree foundation and specialized training in the aerospace discipline. Coursework will focus on aerospace fundamentals, including fluid flow mechanics, propulsion, materials, and manufacturing. The required courses will provide an introduction to the processing steps required in aerospace development, with a focus on the design, manufacturing, and life cycle costs of a specific product.

Requirements Effective Fall 2023

Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
MECH 103	Introduction to Mechanical Engineering		3
MECH 105	Mechanical Engineering Problem Solving		3
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5
1C (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		1C	3
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3

Total Credits **33**

Sophomore

CIVE 260	Engineering Mechanics-Statics		3
CIVE 261	Engineering Mechanics-Dynamics		3
ECE 204	Introduction to Electrical Engineering		3
MATH 261	Calculus for Physical Scientists III		4
MATH 340	Intro to Ordinary Differential Equations		4
Select one group from the following:			3
Group A:			
MECH 200	Introduction to Manufacturing Processes		
Group B:			
MECH 200A	Introduction to Manufacturing Processes: Lecture		
MECH 200B	Introduction to Manufacturing Processes : Laboratory		
MECH 201	Engineering Design I		2
MECH 202	Engineering Design II		3
MECH 231	Engineering Experimentation		3
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	5

Total Credits **33**

Junior

CIVE 360	Mechanics of Solids		3
MECH 301A	Engineering Design III: Finite Element Analysis		1
MECH 301B	Engineering Design III: Computational Fluid Dynamics		1
MECH 307	Mechatronics and Measurement Systems		4
MECH 324	Dynamics of Machines		4
MECH 325	Machine Design		3
Select one group from the following:			4

2 Major in Mechanical Engineering, Aerospace Engineering Concentration

Group A			
MECH 331	Introduction to Engineering Materials		
Group B			
MECH 331A	Introduction to Engineering Materials: Lecture		
MECH 331B	Introduction to Engineering Materials : Lab		
MECH 337	Thermodynamics		4
MECH 338	Thermal/Fluid Sciences Laboratory		1
MECH 342	Fluid Mechanics for Mechanical Engineers		3
MECH 344	Heat and Mass Transfer	4B	3
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)		2	3
Total Credits			34
Senior			
Select one group from the following:			8
Group A:			
MECH 486A	Engineering Design Practicum: I	4A,4C	
MECH 486B	Engineering Design Practicum: II	4C	
Group B:			
MECH 498A	Engineering Research Practicum: I	4A,4C	
MECH 498B	Engineering Research Practicum: II	4C	
Aerospace Engineering Electives – select a minimum of 12 credits from the following:			12
MECH 417	Control Systems		
MECH 420	Aerospace Structures		
MECH 425	Mechanical Engineering Vibrations		
MECH 426	Advanced Machine Design		
MECH 450	Aerospace Propulsion		
MECH 460	Aeronautics		
MECH 468	Space Propulsion and Power Engineering		
MECH 478	Computational Fluid Dynamics		
MECH 507	Laser Diagnostics for Thermosciences		
MECH 515	Advanced Topics in Mechanical Vibrations		
MECH 517	Chemical Rocket Propulsion		
MECH 518	Orbital Mechanics		
MECH 519	Aerospace Vehicles Trajectory and Performance		
MECH 520	Finite Element Analysis in Mechanical Engr		
MECH 535	Mechanics of Composite Materials		
MECH 539	Advanced Fluid Mechanics		
MECH 551	Physical Gas Dynamics I		
MECH 557	Turbomachinery		
MECH 558	Combustion		
MECH 567	Broad-Beam Ion Sources		
SYSE 501	Foundations of Systems Engineering		
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
Total Credits			29
Program Total Credits:			129

Major Completion Map

Distinctive Requirements for Degree Program:

TO DECLARE MAJOR: Competitive entry controls required and capped enrollment in place. Incoming students please see the Office of

Admissions to declare. Current CSU students please see your assigned advisor for information about the waitlist.

TO PREPARE FOR FIRST SEMESTER: The curriculum for this major assumes students enter college prepared to take calculus.

Freshman

Semester 1		Critical	Recommended	AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
CO 150	College Composition (GT-CO2)		X	1A	3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
MECH 103	Introduction to Mechanical Engineering	X			3
Total Credits					15

Semester 2		Critical	Recommended	AUCC	Credits
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4
MECH 105	Mechanical Engineering Problem Solving	X			3
PH 141	Physics for Scientists and Engineers I (GT-SC1)	X		3A	5
1C	(http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)			1C	3
Arts and Humanities	(http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		X	3B	3
CO 150	must be completed by the end of Semester 2.	X			
Total Credits					18

Sophomore

Semester 3		Critical	Recommended	AUCC	Credits
CIVE 260	Engineering Mechanics-Statics	X			3
MATH 261	Calculus for Physical Scientists III	X			4
Select one group from the following:					3
Group A:					
MECH 200	Introduction to Manufacturing Processes	X			
Group B:					
MECH 200A	Introduction to Manufacturing Processes: Lecture				
MECH 200B	Introduction to Manufacturing Processes : Laboratory				
MECH 201	Engineering Design I	X			2
PH 142	Physics for Scientists and Engineers II (GT-SC1)	X		3A	5
Total Credits					17

Semester 4		Critical	Recommended	AUCC	Credits
CIVE 261	Engineering Mechanics-Dynamics	X			3
ECE 204	Introduction to Electrical Engineering	X			3
MATH 340	Intro to Ordinary Differential Equations	X			4
MECH 202	Engineering Design II	X			3
MECH 231	Engineering Experimentation	X			3
Total Credits					16

Junior

Semester 5		Critical	Recommended	AUCC	Credits
CIVE 360	Mechanics of Solids	X			3
MECH 307	Mechatronics and Measurement Systems	X			4
MECH 324	Dynamics of Machines	X			4
MECH 337	Thermodynamics		X		4
MECH 342	Fluid Mechanics for Mechanical Engineers	X			3
Total Credits					18

Semester 6		Critical	Recommended	AUCC	Credits
MECH 301A	Engineering Design III: Finite Element Analysis				1
MECH 301B	Engineering Design III: Computational Fluid Dynamics				1
MECH 325	Machine Design	X			3
Select one group from the following:					4
Group A					
MECH 331	Introduction to Engineering Materials	X			
Group B					
MECH 331A	Introduction to Engineering Materials: Lecture				
MECH 331B	Introduction to Engineering Materials : Lab				
MECH 338	Thermal/Fluid Sciences Laboratory	X			1
MECH 344	Heat and Mass Transfer	X		4B	3
Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X	2	3
Total Credits					16
Senior					
Semester 7		Critical	Recommended	AUCC	Credits
Select one course from the following:					4
MECH 486A	Engineering Design Practicum: I	X		4A,4C	
MECH 498A	Engineering Research Practicum: I	X		4A,4C	
Aerospace Engineering Electives (See List on Requirements Tab)					6
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)			X	3C	3
Total Credits					16
Semester 8		Critical	Recommended	AUCC	Credits
Select one course from the following:					4
MECH 486B	Engineering Design Practicum: II	X		4C	
MECH 498B	Engineering Research Practicum: II	X		4C	
Aerospace Engineering Electives (See List on Requirements Tab)					6
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3
The benchmark courses for the 8th semester are the remaining courses in the entire program of study.			X		
Total Credits					13
Program Total Credits:					129