AEROSPACE ENGINEERING B.S.

Program Requirements

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Minimum Requirements for Aerospace Engineering B.S.: 131 credits

CONCENTRATIONS: AERONAUTICS (P. 1), SPACE SYSTEMS - ASTRONAUTICS (P. 1), UNMANNED AIRCRAFT SYSTEMS (P. 2), GENERAL (P. 2)

Students must earn a C- grade or better in each course.

Code	Title	Credits
General University Requirements		
Complete the general university requirements. (https://catalog.uaf.edu/bachelors/#gurbachelorsdegreestext)		
General Education Requirements		
Complete the general education requirements. (https://catalog.uaf.edu/bachelors/#generaleducationrequirementstext)		36-40
As part of the general education requirements, complete the following:		
MATH F251X	Calculus I	
CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	
ES F100X and ES F100L	Engineering Alaska - An Introduction to Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering	
B.S. Degree Requirements		
Complete the B.S. degree requirements. (https://catalog.uaf.edu/bachelors/#bachelorofsciencetext)		16
As part of the B.S. requirements, complete the following:		
MATH F252X	Calculus II	
PHYS F211X and PHYS F211L	General Physics I and PHYS F211X Laboratory	
PHYS F212X and PHYS F212L	General Physics II and PHYS F212X Laboratory	
Aerospace Engineering Program Requirements		
Complete the following:		
AERO/ME F451	Aerodynamics	3
AERO/ME F452	Introduction to Astrodynamics	3
EE F102	Introduction to Electrical and Computer Engineering	3
EE F203	Electric Circuits	4
EE F243	Digital Systems Design	4
EE F253	Circuit Theory	3
EE F354	Engineering Signal Analysis	3
EE F461	Communication Systems and Networks	4
EE F471	Automatic Control	3
or ME F409	Controls	
EE F481	Electrical and Computer Engineering Design I	1
or ME F486	Senior Design	
EE F482	Electrical and Computer Engineering Design II	3
or ME F487	Design Project	
ES F201	Computer Techniques	3
ES F209	Statics	3
ES F210	Dynamics	3
ES F301	Engineering Analysis	3
or EE F301	Analytical Methods for Electrical and Computer Engineers	
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ES F346	Introduction to Thermodynamics	3
MATH F253X	Calculus III	4
MATH F302	Differential Equations	3
ME F408	Mechanical Vibrations	3
Fundamentals of Engineering (FE) Examination		
Complete the Fundamentals of Engineering (FE) examination administered by the State of Alaska.		
Concentration		
Complete one of the following:		12-13
Aeronautical Engineering		
Space Systems - Astronautics		
Unmanned Aircraft Systems		
General		
Total Credits		**131-135**

Concentrations

AERONAUTICAL ENGINEERING

Code	Title	Credits
Aeronautical Engineering Concentration Requirements		
Complete the following:		
AERO/ME F450	Theory of Flight	3
AERO/ME F453	Propulsion Systems	3
ME F313	Mechanical Engineering Thermodynamics	3
Technical Electives		
Complete 3-4 credits from the technical electives list		3-4
Total Credits		**12-13**

SPACE SYSTEMS - ASTRONAUTICS CONCENTRATION

Code	Title	Credits
Space Systems - Astronautics Concentration Requirements		
Complete the following:		
EE F303	Electric Power Systems and Machines	4
EE F333	Electronic Devices	4
EE F444	Embedded Systems Design	4
Total Credits		**12**

UNMANNED AIRCRAFT SYSTEMS CONCENTRATION

Code	Title	Credits
Unmanned Aircraft Systems Concentration Requirements		
Complete the following:		
AERO F654	UAS Systems Design	3
AERO F656	Aerospace Systems Engineering	3
AERO F658	Unmanned Aircraft Systems (UAS) Operations	3
Technical Electives		
Complete 3-4 credits from the technical electives list		3-4
Total Credits		**12-13**

GENERAL

Code	Title	Credits
Technical Electives		
Complete 12 credits from the technical electives list		12
Total Credits		**12**

Electives

TECHNICAL ELECTIVES

Code	Title	Credits
The following courses satisfy technical electives for the aerospace engineering major.		
AERO/ME F450	Theory of Flight	
AERO/ME F453	Propulsion Systems	
AERO F654	UAS Systems Design	
AERO F656	Aerospace Systems Engineering	
AERO F658	Unmanned Aircraft Systems (UAS) Operations	
CS F453	Robotics & 3D Printing	
CS F463	Cryptography and Data Security	
CS F465	Computer and Network Security	
EE F303	Electric Power Systems and Machines	
EE F333	Electronic Devices	
EE F404	Electric Power Systems Analysis	
EE F443	Computer Engineering Analysis and Design	
EE F444	Embedded Systems Design	
EE F451	Digital Signal Processing	
EE F607	Electric Motor Drives	
ESM F422	Engineering Decisions	
GEOS F416	Applied Geophysics	
GEOS F422	Geoscience Applications of Remote Sensing	
ME F313	Mechanical Engineering Thermodynamics	
ME F405	Computer Aided Design	
ME F406	Computer Aided Manufacturing	
ME F441	Heat and Mass Transfer	
STAT F300	Statistics	

Road Maps

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Road Maps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Some courses and milestones must be completed in the semester listed to ensure timely graduation. Transfer credit may change the road map.

This road map should be used in conjunction with regular academic advising appointments. All students are encouraged to meet with their advisor or mentor each semester. Requirements, course availability and sequencing are subject to change.

AEROSPACE ENGINEERING B.S. WITH AERONAUTICAL ENGINEERING CONCENTRATION

Course	Title	Credits
Freshman		
Fall		
CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	4
COM F131X or COM F131X or COM F141X	Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context	3
ES F100X and ES F100L	Engineering Alaska - An Introduction to Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering	4
ES F201	Computer Techniques	3
MATH F251X	Calculus I	4
	Credits	**18**
Spring		
EE F102	Introduction to Electrical and Computer Engineering	3
MATH F252X	Calculus II	4
PHYS F211X	General Physics I	4
WRTG F111X	Writing Across Contexts	3
AHSSE		3
	Credits	**17**
Sophomore		
Fall		
EE F203	Electric Circuits	4
EE F243	Digital Systems Design	4
ES F209	Statics	3
MATH F253X	Calculus III	4
WRTG F212X/F213X/F214X	Writing and the Professions	3
	Credits	**18**
Spring		
EE F253	Circuit Theory	3
ES F210	Dynamics	3
ES F346	Introduction to Thermodynamics	3

LS F101X	Library Information and Research	1
MATH F302	Differential Equations	3
PHYS F212X and PHYS F212L	General Physics II and PHYS F212X Laboratory	4
	Credits	**17**
Junior		
Fall		
ES/EE F301	Engineering Analysis	3
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ME F408	Mechanical Vibrations	3
AHSSE		3
	Credits	**16**
Spring		
AERO/ME F451	Aerodynamics	3
EE F471/ME F409	Automatic Control	3
ME F313	Mechanical Engineering Thermodynamics	3
AHSSE		3
AHSSE		3
	Credits	**15**
Senior		
Fall		
AERO/ME F450	Theory of Flight	3
AERO/ME F452	Introduction to Astrodynamics	3
EE F354	Engineering Signal Analysis	3
EE F481/ME F486	Electrical and Computer Engineering Design I	1
AHSSE		3
Tech Elective		3
	Credits	**16**
Spring		
AERO/ME F453	Propulsion Systems	3
EE F461	Communication Systems and Networks	4
EE F482/ME F487	Electrical and Computer Engineering Design II	3
AHSSE		3
	Credits	**13**
	Total Credits	**130**

AEROSPACE ENGINEERING B.S. WITH SPACE SYSTEMS - ASTRONAUTICS CONCENTRATION

Course	Title	Credits
Freshman		
Fall		
CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	4
COM F121X or COM F131X or COM F141X	Introduction to Interpersonal Communication or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context	3
ES F100X and ES F100L	Engineering Alaska - An Introduction to Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering	4
ES F201	Computer Techniques	3
MATH F251X	Calculus I	4
	Credits	**18**
Spring		
EE F102	Introduction to Electrical and Computer Engineering	3
MATH F252X	Calculus II	4
PHYS F211X	General Physics I	4
WRTG F111X	Writing Across Contexts	3
AHSSE		3
	Credits	**17**
Sophomore		
Fall		
EE F203	Electric Circuits	4
EE F243	Digital Systems Design	4
ES F209	Statics	3
MATH F253X	Calculus III	4
WRTG F212X/F213X/F214X	Writing and the Professions	3
	Credits	**18**
Spring		
EE F253	Circuit Theory	3
ES F210	Dynamics	3
ES F346	Introduction to Thermodynamics	3
LS F101X	Library Information and Research	1
MATH F302	Differential Equations	3
PHYS F212X and PHYS F212L	General Physics II and PHYS F212X Laboratory	4
	Credits	**17**
Junior		
Fall		
EE F333	Electronic Devices	4
ES/EE F301	Engineering Analysis	3
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ME F408	Mechanical Vibrations	3
	Credits	**17**
Spring		
AERO/ME F451	Aerodynamics	3
EE F444	Embedded Systems Design	4
EE F471/ME F409	Automatic Control	3
AHSSE		3
AHSSE		3
	Credits	**16**
Senior		
Fall		
AERO/ME F452	Introduction to Astrodynamics	3
EE F303	Electric Power Systems and Machines	4
EE F354	Engineering Signal Analysis	3

EE F481/ME F486	Electrical and Computer Engineering Design I	1
AHSSE		3
	Credits	**14**
Spring		
EE F461	Communication Systems and Networks	4
EE F482/ME F487	Electrical and Computer Engineering Design II	3
AHSSE		3
AHSSE		3
	Credits	**13**
	Total Credits	**130**

AEROSPACE ENGINEERING B.S. WITH UNMANNED AIRCRAFT SYSTEMS CONCENTRATION

Course	Title	Credits
Freshman		
Fall		
CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	4
COM F121X or COM F131X or COM F141X	Introduction to Interpersonal Communication or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context	3
ES F100X and ES F100L	Engineering Alaska - An Introduction to Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering	4
ES F201	Computer Techniques	3
MATH F251X	Calculus I	4
	Credits	**18**
Spring		
EE F102	Introduction to Electrical and Computer Engineering	3
MATH F252X	Calculus II	4
PHYS F211X	General Physics I	4
WRTG F111X	Writing Across Contexts	3
AHSSE		3
	Credits	**17**
Sophomore		
Fall		
EE F203	Electric Circuits	4
EE F243	Digital Systems Design	4
ES F209	Statics	3
MATH F253X	Calculus III	4
WRTG F212X/F213X/ F214X	Writing and the Professions	3
	Credits	**18**
Spring		
EE F253	Circuit Theory	3
ES F210	Dynamics	3
ES F346	Introduction to Thermodynamics	3
LS F101X	Library Information and Research	1
MATH F302	Differential Equations	3
PHYS F212X and PHYS F212L	General Physics II and PHYS F212X Laboratory	4
	Credits	**17**
Junior		
Fall		
AERO F654	UAS Systems Design	3
ES/EE F301	Engineering Analysis	3
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ME F408	Mechanical Vibrations	3
	Credits	**16**
Spring		
AERO/ME F451	Aerodynamics	3
EE F471/ME F409	Automatic Control	3
AHSSE		3
AHSSE		3
AHSSE		3
	Credits	**15**
Senior		
Fall		
AERO/ME F452	Introduction to Astrodynamics	3
AERO F656	Aerospace Systems Engineering	3
EE F354	Engineering Signal Analysis	3
EE F481/ME F486	Electrical and Computer Engineering Design I	1
AHSSE		3
Tech Elective		3
	Credits	**16**
Spring		
AERO F658	Unmanned Aircraft Systems (UAS) Operations	3
EE F461	Communication Systems and Networks	4
EE F482/ME F487	Electrical and Computer Engineering Design II	3
AHSSE		3
	Credits	**13**
	Total Credits	**130**

AEROSPACE ENGINEERING B.S. WITH GENERAL CONCENTRATION

Course	Title	Credits
Freshman		
Fall		
CHEM F105X and CHEM F105L	General Chemistry I and Chemistry F105X Lab	4
COM F121X or COM F131X or COM F141X	Introduction to Interpersonal Communication or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context	3

ES F100X and ES F100L	Engineering Alaska - An Introduction to Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering	4
ES F201	Computer Techniques	3
MATH F251X	Calculus I	4
	Credits	**18**
Spring		
EE F102	Introduction to Electrical and Computer Engineering	3
MATH F252X	Calculus II	4
PHYS F211X	General Physics I	4
WRTG F111X	Writing Across Contexts	3
AHSSE		3
	Credits	**17**
Sophomore		
Fall		
EE F203	Electric Circuits	4
EE F243	Digital Systems Design	4
ES F209	Statics	3
MATH F253X	Calculus III	4
WRTG F212X/F213X/ F214X	Writing and the Professions	3
	Credits	**18**
Spring		
EE F253	Circuit Theory	3
ES F346	Introduction to Thermodynamics	3
ES F210	Dynamics	3
LS F101X	Library Information and Research	1
MATH F302	Differential Equations	3
PHYS F212X and PHYS F212L	General Physics II and PHYS F212X Laboratory	4
	Credits	**17**
Junior		
Fall		
ES/EE F301	Engineering Analysis	3
ES F331	Mechanics of Materials	3
ES F341	Fluid Mechanics	4
ME F408	Mechanical Vibrations	3
AHSSE		3
	Credits	**16**
Spring		
AERO/ME F451	Aerodynamics	3
EE F471/ME F409	Automatic Control	3
AHSSE		3
AHSSE		3
Tech Elective		3
	Credits	**15**
Senior		
Fall		
AERO/ME F452	Introduction to Astrodynamics	3
EE F354	Engineering Signal Analysis	3
EE F481/ME F486	Electrical and Computer Engineering Design I	1
AHSSE		3
Tech Elective		3
Tech Elective		3
	Credits	**16**
Spring		
EE F461	Communication Systems and Networks	4
EE F482/ME F487	Electrical and Computer Engineering Design II	3
AHSSE		3
Tech Elective		3
	Credits	**13**
	Total Credits	**130**