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 Unive	ersity Requirements		
	general university req du/bachelors/#gurbac		
General Educ	ation Requirements		
(https://catal	e general education rec log.uaf.edu/bachelors, cationrequirementstex	/	36-40
As part of the following:	e general education red	quirements, complete	e the

MATH F251X	Calculus I
CHEM F105X	General Chemistry I
and CHEM F105L	and Chemistry F105X Lab
ES F100X	Engineering Alaska - An Introduction to
and ES F100L	Engineering
	and Makerspace Alaska - A Laboratory
	Introduction to Engineering

B.S. Degree Requirements

Complete the B.S. degree requirements. (https:// 16 catalog.uaf.edu/bachelors/#bachelorofsciencetext)

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	ng:	
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	

Total Credits	1	131-135
General		
Unmanned Aircraft	t Systems	
Space Systems - A	stronautics	
Aeronautical Engin	neering	
Complete one of the f	following:	12-13
Concentration		
Complete the Fundamental administered by the S	nentals of Engineering (FE) examination State of Alaska.	
Fundamentals of Engir	neering (FE) Examination	
ME F408	Mechanical Vibrations	3
MATH F302	Differential Equations	3
MATH F253X	Calculus III	4
ES F346	Introduction to Thermodynamics	3
ES F341	Fluid Mechanics	4
ES F331	Mechanics of Materials	3
or EE F301	Analytical Methods for Electrical and Comp Engineers	uter
ES F301	Engineering Analysis	3
ES F210	Dynamics	3
ES F209	Statics	3
ES F201	Computer Techniques	3
or ME F487	Electrical and Computer Engineering Design II Design Project	3
or ME F486 FF F482	Senior Design	3
EE F481	Electrical and Computer Engineering Design I	1

Concentrations AERONAUTICAL ENGINEERING

Code	Title	Credits
Aeronautical Engin	eering Concentration Requirements	
Complete the follow	ving:	
AERO/ME F450	Theory of Flight	3
AERO/ME F453	Propulsion Systems	3
ME F313	Mechanical Engineering Thermodynamics	3
Technical Electives		
Complete 3-4 credi	ts from the technical electives list	3-4
Total Credits		12-13

SPACE SYSTEMS - ASTRONAUTICS CONCENTRATION

Code	Title	Credits
Space Systems	s - Astronautics Concentration Requirements	
Complete the fo	ollowing:	
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 Aircra	aft Systems Concentration Requirements	
Complete the fol	lowing:	
AERO F654	UAS Systems Design	3
AERO F656	Aerospace Systems Engineering	3
AERO F658	Unmanned Aircraft Systems (UAS) Operations	3
Technical Electiv	es	
Complete 3-4 cre	dits from the technical electives list	3-4
Total Credits		12-13

GENERAL

Code

Code	Title	Credits
Technical Ele	ctives	
Complete 12	credits from the technical electives list	12
Total Credits		12

Electives TECHNICAL ELECTIVES

The following courses satisfy technical electives for the aerospace engineering major.			
AERO/M	IE F450	Theory of Flight	
AERO/M	IE F453	Propulsion Systems	
AERO F6	554	UAS Systems Design	
AERO F	556	Aerospace Systems Engineering	
AERO F6	558	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 F42	22	Engineering Decisions	
GEOS F4	116	Applied Geophysics	
GEOS F4	122	Geoscience Applications of Remote Sensing	
ME F313	3	Mechanical Engineering Thermodynamics	
ME F405	5	Computer Aided Design	
ME F406	5	Computer Aided Manufacturing	
ME F441		Heat and Mass Transfer	
STAT F3	00	Statistics	

Road Maps

Credits

ES F346

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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

and CHEM F105L and Chemistry F105X Lab COM F131X Fundamentals of Oral Communication: or COM F131X Or Fundamentals of Oral Communication: or COM F141X Or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context ES F100X Engineering Alaska - An Introduction to and ES F100L Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering ES F201 Computer Techniques MATH F251X Calculus I Credits Spring EE F102 Introduction to Electrical and Computer Engineering MATH F252X Calculus II PHYS F211X General Physics I WRTG F111X Writing Across Contexts AHSSE Credits 17 Sophomore Fall EE F203 Electric Circuits EE F243 Digital Systems Design ES F209 Statics MATH F253X Calculus III WRTG F212X/F213X/ Writing and the Professions F214X Credits 18 Spring EE F253 Circuit Theory 3 AFFIGURE AND	F	Course Treshman Fall	Title	Credits
or COM F131X Group Context or COM F141X or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral Communication: Public Context ES F100X Engineering Alaska - An Introduction to and ES F100L 4 Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering 3 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/ Writing and the Professions 3 F214X Credits 18 Spring <			•	4
and ES F100L Engineering and Makerspace Alaska - A Laboratory Introduction to Engineering ES F201 Computer Techniques 3 MATH F251X Calculus I 4 Credits 18 Spring EE F102 Introduction to Electrical and Computer Engineering 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 EE F243 Digital Systems Design 4 ES F209 Statics 3 MATH F253X Calculus III 4 WRTG F212X/F213X/ Writing and the Professions 7 F214X Credits 18 Spring EE F253 Circuit Theory 3	C	or COM F131X	Group Context or Fundamentals of Oral Communication: Group Context or Fundamentals of Oral	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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3			Engineering and Makerspace Alaska - A Laboratory	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 7 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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Е	S F201	Computer Techniques	3
Spring EE F102 Introduction to Electrical and Computer Engineering 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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Ν	ИАТН F251X	Calculus I	4
EE F102	_		Credits	18
Engineering MATH F252X Calculus I	S	Spring		
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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	E	E F102	•	3
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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Ν	ИАТН F252X	Calculus II	4
AHSSE Credits 17 Sophomore Fall EE F203	F	PHYS F211X	General Physics I	4
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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	٧	VRTG F111X	Writing Across Contexts	3
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/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Α	HSSE		3
Fall EE F203 Electric Circuits 4 EE F243 Digital Systems Design 4 ES F209 Statics 3 MATH F253X Calculus III 4 WRTG F212X/F213X/ Writing and the Professions F214X 3 Credits 18 Spring EE F253 Circuit Theory 3	_		Credits	17
EE F243 Digital Systems Design 4 ES F209 Statics 3 MATH F253X Calculus III 4 WRTG F212X/F213X/ Writing and the Professions F214X 3 Credits 18 Spring EE F253 Circuit Theory 3		•		
ES F209 Statics 3 MATH F253X Calculus III 4 WRTG F212X/F213X/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Е	E F203	Electric Circuits	4
MATH F253X Calculus III 4 WRTG F212X/F213X/ Writing and the Professions 3 F214X Credits 18 Spring EE F253 Circuit Theory 3	Е	E F243	Digital Systems Design	4
WRTG F212X/F213X/ Writing and the Professions F214X Credits 18 Spring EE F253 Circuit Theory 3	E	S F209	Statics	3
F214X Credits 18 Spring EE F253 Circuit Theory 3	Ν	ИАТН F253X	Calculus III	4
Spring EE F253 Circuit Theory 3			Writing and the Professions	3
EE F253 Circuit Theory 3	_		Credits	18
	S	Spring		
E0 E010	E	E F253	Circuit Theory	3
ES F210 Dynamics 3	E	S F210	Dynamics	3

Introduction to Thermodynamics

3

	Total Credits	130
	Credits	13
AHSSE		3
	Design II	
EE F482/ME F487	Electrical and Computer Engineering	3
EE F461	Communication Systems and Networks	4
Spring AERO/ME F453	Propulsion Systems	3
	Credits	16
Tech Elective		3
AHSSE	Design I	3
EE F481/ME F486	Electrical and Computer Engineering	1
EE F354	Engineering Signal Analysis	3
AERO/ME F452	Introduction to Astrodynamics	3
AERO/ME F450	Theory of Flight	3
Fall		
Senior		
7.1.1002	Credits	15
AHSSE		3
AHSSE		3
ME F313	Mechanical Engineering Thermodynamics	3
EE F471/ME F409	Automatic Control	3
AERO/ME F451	Aerodynamics	3
Spring		
	Credits	16
AHSSE		3
ME F408	Mechanical Vibrations	3
ES F341	Fluid Mechanics	4
ES F331	Mechanics of Materials	3
Fall ES/EE F301	Engineering Analysis	3
Junior	Greats	.,
and PHYS FZ1ZL	and PHYS F212X Laboratory Credits	17
PHYS F212X and PHYS F212L	General Physics II	4
MATH F302	Differential Equations	3
LS F101X	Library Information and Research	1

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

Course Freshman Fall	Title	Credits
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	4
and EST TOOL	and Makerspace Alaska - A Laboratory Introduction to Engineering	
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
Sophomore Fall	Credits	17
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

	Total Credits	130
	Credits	13
AHSSE	Designin	3
EE F482/ME F487	Electrical and Computer Engineering Design II	3
EE F461	Communication Systems and Networks	4
AERO F658	Unmanned Aircraft Systems (UAS) Operations	3
Spring	Credits	16
Tech Elective		3
AHSSE		3
	Design I	
EE F481/ME F486	Electrical and Computer Engineering	ა 1
EE F354	Engineering Signal Analysis	3
AERO/ME F452 AERO F656	Introduction to Astrodynamics Aerospace Systems Engineering	3
Fall	Introduction to Astroducemics	2
Senior	Credits	15
AHSSE	- "	3
AHSSE		3
AHSSE		3
EE F471/ME F409	Automatic Control	3
AERO/ME F451	Aerodynamics	3
Spring	Credits	16
ME F408	Mechanical Vibrations	3
ES F341	Fluid Mechanics	4
ES F331	Mechanics of Materials	3
ES/EE F301	Engineering Analysis	3
AERO F654	UAS Systems Design	3
Junior Fall		
	Credits	17
and PHYS F212L	and PHYS F212X Laboratory	4
	·	
		-
LS F101X MATH F302 PHYS F212X	Library Information and Research Differential Equations General Physics II	1 3 2

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
or COM F131X 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
	Writing and the Professions	3
F214X	Witting and the Froressions	Ü
	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
Spring	Credits	16
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