AEROSPACE ENGINEERING - BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING

The aerospace engineering program prepares students for a range of professional engineering careers in aerospace and related professions. The aerospace engineering curriculum covers the important classical areas of low and high speed aerodynamics, propulsion, orbital mechanics, flight mechanics and control, aerospace structures and laboratory practice. In addition, the principles of systems engineering and design that are necessary to conceive, design, analyze and troubleshoot complex engineering systems are covered extensively and are considered to be especially important in the overall educational experience. Students will also be encouraged to participate in significant non-classroom experiences, including:

- co-ops and internships;
- industrial and laboratory field trips;
- guest speakers from outside NMSU;
- the New Mexico Space Grant Program;
- special seminar programs on current topics in aerospace.

Aerospace engineers find employment in areas of launch vehicles, space vehicles and missions, aircraft systems design, land and sea vehicle design, robotics and automated manufacturing, safety and other areas. The aerospace engineering background also allows graduates to pursue careers in non-aerospace fields of engineering. Graduates of the aerospace engineering program will be prepared to apply the following skills to problems of interest either in the industry or research and development:

- engineering sciences,
- mathematics,
- computational methods,
- modern experimental methods,
- effective communication skills and
- systems engineering principles.

The aerospace engineering program is also intended to prepare students to pursue graduate study, which can be of significant benefit in the aerospace profession. The general goals of the aerospace engineering program, as well as the program educational objectives, are the same as those stated above for the mechanical engineering program.

Requirements (122 Credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science, and engineering courses applied toward their Bachelor of Science in Aerospace Engineering (AE) and/or Mechanical Engineering (ME) minor.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
Area III/IV: Laboratory Sciences & Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
Area IV: Social/Behavioral Sciences [1]		3
Areas V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing a Wider World		
Viewing a Wider World Elective [3]		3
Select one Viewing A Wider World course from the following:		3
MATH 4110V	Great Theorems in Mathematics	
PHYS 303V	Energy and Society in the New Millennium	
PHYS 305V	The Search for Water in the Solar System	
Departmental/College Requirements		
Mechanical Engineering		
ENGR 110	Introduction to Engineering Design	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
M E 228	Engineering Analysis I	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
M E 328	Engineering Analysis II	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
Aerospace Engineering [4]		
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 439	Aerodynamics II	3
A E 424	Aerospace Systems Engineering	3
A E 428	Aerospace Capstone Design [5]	3
A E 447	Aerofluids Laboratory	3
Select one Aerospace Engineering Senior Elective from the following:		3
A E 405	Special Topics	
A E 451	Aircraft Design	
A E 452	Control System Design	

A E 464	Advanced Flight Dynamics and Controls	
A E 469	Hypersonic Aerothermodynamics	
M E 401	Building Energy and Environment	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 457	Engineering Failure Analysis	
M E 458	Properties and Mechanical Behavior of Materials	
M E 460	Applied Finite Elements	
M E 481	Alternative and Renewable Energy	
M E 483	Introduction to Combustion	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
Non- Departmental Requirements		
Mathematics		
MATH 2530G	Calculus III	3
Natural Science		
PHYS 1320G	Calculus -Based Physics II	3
Engineering		
ENGR 190	Introduction to Engineering Mathematics	4
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3
Second Language: (not required)		
Electives to bring the total credits to 122		**0**
Total Credits		**122**

1 See General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section in this catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section in this catalog for a full list of courses.

4 Some courses could be subject to once per year rotation.

5 A E 428 Aerospace Capstone Design can be substituted by ENGR 401 Engineering Capstone I for those who pursue dual degrees in Mechanical Engineering and in Aerospace Engineering.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		
Fall		**Credits**
MATH 1511G	Calculus and Analytic Geometry I [1]	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G	Composition I	4
	Credits	**16**
Spring		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ENGR 110	Introduction to Engineering Design	3
English Composition - Level 2 [2]		3
Area IV: Social/Behavioral Sciences [2]		3
	Credits	**17**
Sophomore		
Fall		
MATH 2530G	Calculus III	3
PHYS 1320G	Calculus -Based Physics II	3
ENGR 233	Engineering Mechanics I	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
	Credits	**16**
Spring		
M E 228	Engineering Analysis I	3
ENGR 234	Engineering Mechanics II	3
M E 261	Numerical Methods	3
M E 240	Thermodynamics	3
Oral Communications Elective [2]		3
	Credits	**15**
Junior		
Fall		
M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 364	Flight Dynamics and Controls	3
C E 301	Mechanics of Materials	3
M E 349	MAE Career Seminar	1
	Credits	**16**
Spring		
A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II	3
A E 363	Aerospace Structures	3
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
	Credits	**15**
Senior		
Fall		
CHME 361	Engineering Materials	3
A E 419	Propulsion	3
A E 447	Aerofluids Laboratory	3
Area V: Humanities [2]		3
Area VI: Creative and Fine Arts [2]		3
	Credits	**15**
Spring		
A E 428	Aerospace Capstone Design	3
Aerospace engineering senior elective		3
Viewing a Wider World [3]		3
Viewing a Wider World [3]		3
	Credits	**12**
	Total Credits	**122**

[1] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

[2] See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section in this catalog for a full list of courses.

[3] See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section in this catalog for a full list of courses.