MECHANICAL ENGINEERING - BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

The mechanical engineering program prepares students for a wide range of professional engineering careers in such areas as: research and development; design; facilities operation and maintenance; management; and production. Graduates of the program will be prepared to apply engineering sciences, mathematics, computational methods, modern experimental methods, and effective communication skills to problems of interest in industry as well as government or scholarly topics. Employment opportunities for graduates are extensive. These opportunities include: energy and utility; manufacturing; automotive; aerospace; defense and space; research and development; and many others. The emphasis in the curriculum is on engineering sciences (solid mechanics, thermal sciences, fluid mechanics and materials science); mathematics; engineering analysis; engineering design; general sciences; and communication balanced with general education topics and electives. Graduates of the program will also be prepared for graduate studies (subject to grade-point and standardized test qualifications). Students will be prepared to take the fundamentals of engineering examination (and are encouraged to do so) as a step towards professional registration.

Requirements (123 Credits)

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 Mechanical Engineering (ME) and/or Aerospace Engineering (AE) minor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 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.

Prefix	Title	Credits
General Education		
State of New Mexico Common Core		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		*3*
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		**6**
Viewing a Wider World courses [3]		
Departmental/College Requirements		
Mechanical Engineering		
ENGR 110	Introduction to Engineering Design	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
M E 228	Engineering Analysis I	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
M E 326	Mechanical Design	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 340	Applied Thermodynamics	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Select one Mechanics Elective from the following: [4]		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
Select two Mechanical Engineering Electives from the following:		6
M E 401	Building Energy and Environment	
M E 405	Special Topics	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
M E 457	Engineering Failure Analysis	
M E 458	Properties and Mechanical Behavior of Materials	
M E 481	Alternative and Renewable Energy	
M E 483	Introduction to Combustion	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
A E 405	Special Topics	
A E 451	Aircraft Design	
A E 464	Advanced Flight Dynamics and Controls	
A E 469	Hypersonic Aerothermodynamics	
ENGR 400	Special Topics [5]	
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
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives to bring the total credits to 123		**0**
Total Credits		**123**

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

4 A E 362 Orbital Mechanics, A E 363 Aerospace Structures, or A E 364 Flight Dynamics and Controls can be counted towards the Mechanics Elective course requirement for those who are pursuing dual degrees in Mechanical Engineering and Aerospace Engineering. However, these cannot be double-counted for a minor degree.

5 The total number of credits must be 3 in order for ENGR 400 to be counted as Mechanical Engineering Elective. ENGR 400 Special Topics credits more than 3 would not be accepted as any additional Mechanical Engineering Elective.

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 or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
	Credits	**16**
Spring		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ENGR 110	Introduction to Engineering Design	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Area IV: Social/Behavorial Sciences Course [2]		3
	Credits	**17**

Sophomore

Fall		
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
PHYS 1320G	Calculus -Based Physics II	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
	Credits	**17**
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
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
	Credits	**15**

Junior

Fall		
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
C E 301	Mechanics of Materials	3
M E 340	Applied Thermodynamics	3
CHME 361	Engineering Materials	3
M E 349	MAE Career Seminar	1
	Credits	**16**
Spring		
M E 326	Mechanical Design	3
Choose one Mechanics Elective from the following: [4]		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
Area V: Humanities Course [2]		3
	Credits	**15**

Senior

Fall		
ENGR 401	Engineering Capstone I	3
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Viewing a Wider World Course [3]		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Mechanical Engineering Senior Electives		6

Viewing a Wider World Course [3]	3
Credits	**12**
Total Credits	**123**

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2. See General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section in the catalog for a full list of courses.
3. See Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section in the catalog for a full list of courses.
4. A E 362 Orbital Mechanics, A E 363 Aerospace Structures, or A E 364 Flight Dynamics and Controls can be counted towards the Mechanics Elective course requirement for those who are pursuing dual degrees in Mechanical Engineering and Aerospace Engineering. However, these cannot be double-counted for a minor degree.