

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 (122 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 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.

| Prefix | Title | Credits |
|---|---|---------|
| General Education | | |
| State of New Mexico Common Core | | |
| <i>Area I: Communications</i> | | |
| <i>English Composition - Level 1</i> | | |
| ENGL 1110G | Composition I | 4 |
| <i>English Composition - Level 2¹</i> | | |
| <i>Oral Communication¹</i> | | 3 |
| <i>Area II: Mathematics</i> | | |
| MATH 1511G | Calculus and Analytic Geometry I ² | 4 |
| <i>Area III/IV: Laboratory Sciences and Social Behavioral Sciences</i> | | |
| CHEM 1215G | General Chemistry I Lecture and Laboratory for STEM Majors | 11 |
| PHYS 1310G & PHYS 1310L | Calculus -Based Physics I and Calculus -Based Physics I Lab | |
| <i>Area IV: Social/Behavioral Sciences Course (3 credits)¹</i> | | |
| <i>Area V: Humanities¹</i> | | 3 |
| <i>Area VI: Creative and Fine Arts¹</i> | | 3 |

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| <i>General Education Elective</i> | | |
| MATH 1521G | Calculus and Analytic Geometry II | 4 |
| Viewing A Wider World | | |
| Viewing a Wider World course (differs from below and is not in the College of AS) ³ | | |
| Select one Viewing A Wider World course from the following: | | |
| 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 | | |
| <i>Mechanical Engineering</i> | | |
| ENGR 110 | Introduction to Engineering Design | 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 |
| 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 | | |
| M E 331 | Intermediate Strength of Materials | 3 |
| M E 332 | Vibrations | |
| M E 333 | Intermediate Dynamics | |
| Select two Mechanical Engineering Electives from the following: | | |
| M E 401 | Building Energy and Environment | 6 |
| M E 405 | Special Topics | |
| M E 452 | Control System Design | |
| M E 456 | Experimental Modal Analysis | |
| M E 458 | Properties and Mechanical Behavior of Materials | |
| M E 481 | Alternative and Renewable Energy | |
| M E 486 | Introduction to Robotics | |
| A E 405 | Special Topics | |
| A E 451 | Aircraft Design | |
| A E 452 | Control System Design | |
| A E 464 | Advanced Flight Dynamics and Controls | |
| Non-Departmental Requirements | | |
| <i>Mathematics</i> | | |
| MATH 2530G | Calculus III | 3 |
| <i>Natural Science</i> | | |
| PHYS 1320G | Calculus -Based Physics II | 3 |
| <i>Engineering</i> | | |
| 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 |

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| Second Language: (not required) | |
| Electives to bring the total credits to 122 | 0 |
| Total Credits | 122 |

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.

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 | Calculus -Based Physics I | 4 |
| & PHYS 1310L | and Calculus -Based Physics I Lab | |
| ENGR 110 | Introduction to Engineering Design | 3 |
| Area I: Communications - English Composition - Level 2 Course ² | | 3 |
| Area IV: Social/Behavioral 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 |
| 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 |

| Area I: Communications - Oral Communications Course ² | | 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 |
| Area VI: Creative and Fine Arts Course ² | | 3 |
| Viewing a Wider World Course ³ | | 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 | 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 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.

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