

- able to apply various industrial engineering techniques in an integrated fashion to solve real world problems in process design and/or improvement;
- able to obtain meaningful employment or enroll in a graduate program; and
- prepared for a long-term, successful career sustained by life-long learning experiences.

In addition, the Accreditation Board of Engineering and Technology Engineering Criteria 2000, in conjunction with the Institute of Industrial Engineers, requires that:

- baccalaureate degree graduates will be able to demonstrate the ability to design, develop, implement and improve integrated systems that include people, materials, information, equipment and energy;
- industrial engineering curriculums include in-depth instruction allowing students to accomplish the integration of systems using appropriate analytical, computational and experimental practices; and
- that faculty teaching in industrial engineering departments show evidence of understanding professional practice and maintain currency in their respective professional areas. Program faculty must have responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Requirements (Total credits 133)

In addition to the university requirements for graduation, a student must have a 2.0 grade-point average in all departmental courses and take the Fundamentals of Engineering Examination prior to graduation.

Freshman Year (33 credits)

CHEM 111, General Chemistry I.....	4
ENGL 111G, Rhetoric and Composition.....	4
I E 110, Industrial Engineering Orientation.....	1
I E 151, Computational Methods in Industrial Engineering I.....	3
I E 152, Introduction to Industrial Engineering.....	2
MATH 191, 192, Calculus and Analytic Geometry I, II.....	6
M E 159, Graphical Communication and Design.....	2
PHYS 215, Engineering Physics I.....	3
PHYS 215L, Engineering Physics I Lab.....	1
Approved general education elective: Literature and Fine Arts**.....	3
Science elective*.....	4

Sophomore Year (33 credits)

C E 233, Mechanics-Statics, or M E 236, Engineering Mechanics I.....	3
ECON 251G, Principles of Macroeconomics.....	3
I E 217, Manufacturing Processes.....	2
I E 217L, Manufacturing Processes Lab.....	1
I E 311, Engineering Data Analysis.....	3
I E 351, Computation Methods in Industrial Engineering II.....	3
MATH 291 Calculus and Analytic Geometry III.....	3
PSY 201G, Introduction to Psychology.....	3
Engineering science elective*.....	6
Math elective* (Linear Algebra).....	3
Science elective*.....	3

Junior Year (33 credits)

ACCT 251, Management Accounting.....	3
CH E 361, Engineering Materials.....	3
ENGL 218G, Technical and Professional Communication.....	3
I E 316, Methods Engineering.....	3
I E 365, Quality Control.....	3
I E 467, Simulation Modeling.....	4
MATH 392, Differential Equations.....	3
Math elective*, upper-division.....	3
Engineering elective*.....	3
Approved general education elective: Historical Perspectives**.....	3
Approved general education elective: Viewing a Wider World†.....	3

Senior Year (33 credits)

COMM 265G, Principles of Human Communication.....	3
I E 413, Engineering Operations Research I.....	3
I E 423, Engineering Operations Research II.....	3
I E 424, Manufacturing Systems.....	3
I E 451, Engineering Economy.....	3
I E 460, Evaluation of Engineering Data.....	3

I E 478, Facilities Planning and Design.....	3
I E 480, Senior Design.....	3
Engineering electives*.....	6
Approved general education elective: Viewing a Wider World†.....	3

*A detailed list of approved electives is available in the Department of Industrial Engineering.

**The catalog section "General Education Courses and Requirements" includes a list of approved electives.

***A two-course sequence in either physics or chemistry is required.

†A detailed list of approved VWW electives is available in the Department of Industrial Engineering. Students should choose VWW electives that meet the ABET humanities and social science requirements.

MECHANICAL ENGINEERING

Associate Professor Ronald J. Pederson†, interim department head

Professors Genin†, Hardee*†, Hills, Smith* (emeritus); **Associate Professors** Choo, Conley†, Garcia, Leslie, Ma; **Assistant Professors** Allen, Park, Sevostianov, Shashikanth; **College Professors** Donaldson*, Hill
(505) 646-3501

*Registered Professional Engineer (NM)

†Registered Professional Engineer (State other than NM)

DEGREE: 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 and government or scholarly topics. Employment opportunities for graduates are extensive. These 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.

Mechanical Engineering Educational Goals and Objectives

The goals of the Department of Mechanical Engineering, as set forth in the departmental strategic plan, are

- to educate those who will advance knowledge and become the future leaders of industry and academia;
- to conduct both basic and applied research in mechanical engineering and related interdisciplinary areas; and
- to provide service to the profession, to the State of New Mexico, to the country, and to the future development of engineering world wide.

A critical focus within the department is to afford undergraduates of varying backgrounds and abilities every opportunity for achieving success in the mechanical engineering profession. To address this focus, the faculty of the mechanical engineering department, with input from other constituents, have established the following educational objectives for the undergraduate program:

- to prepare students for successful careers and lifelong learning;
- to educate students thoroughly in engineering science and methods of analysis, including the mathematical and computational methods appropriate for engineers to use when solving problems;
- to develop the skills pertinent to the design process, including the students' ability to formulate problems, to think creatively, to communicate effectively, to synthesize information, and to work collaboratively;
- to teach students to use modern experimental and data analysis techniques; and

- to instill in our students an understanding of their professional and ethical responsibilities.

Graduation Requirements

In addition to the NMSU requirements for graduation, a student must obtain a minimum grade of C in mechanical engineering courses.

Requirements (Total credits 129)

Freshman Year (32 credits)

CHEM 111, General Chemistry I, and CHEM 112, Chemistry II.....	8
ENGL 111G, Rhetoric and Composition.....	4
ENGL 218G, Technical and Scientific Communication.....	3
MATH 191, 192, Calculus and Analytic Geometry I, II.....	6
M E 102, Mechanical Engineering Orientation.....	1
M E 159, Graphical Communication and Design.....	2
M E 166, Introduction to Mechanical Engineering.....	2
M E 222, Product Development/ Laboratory.....	3
Approved General Education Literature and Fine Arts elective.....	3

Sophomore Year (33 credits)

C E 301, Mechanics of Materials.....	3
COMM 265G, Principles of Human Communication.....	3
E E 201, Networks I.....	3
MATH 291, Calculus and Analytic Geometry III.....	3
MATH 392, Differential Equations.....	3
M E 236, Engineering Mechanics I.....	3
M E 237, Engineering Mechanics II.....	3
M E 240, Thermodynamics.....	3
M E 260, Mechanical Engineering Problem Solving.....	3
PHYS 215, Engineering Physics I.....	3
PHYS 216, Engineering Physics II.....	3

Junior Year (33 credits)

CH E 361, Engineering Materials.....	3
ECON 251G, Principles of Macroeconomics, or ECON 252G, Principles of Microeconomics.....	3
M E 328, Engineering Analysis I.....	3
M E 338, Fluid Mechanics.....	3
M E 340, Applied Thermodynamics.....	3
M E 345, Experimental Methods I.....	3
M E 329, Engineering Analysis II.....	3
M E 326, Mechanical Design.....	3
M E 341, Heat Transfer.....	3
Approved General Education History elective.....	3
Approved Mechanics elective*.....	3

Senior Year (31 credits)

M E 425, Design of Machine Elements.....	3
M E 426, Design Project Laboratory I.....	3
M E 427, Design Project Laboratory II.....	3
M E 445, Experimental Methods II.....	3
M E 449, Mechanical Engineering Senior Seminar.....	1
Approved General Education Human Thought and Behavior elective.....	3
Approved General Education Viewing a Wider World elective.....	3
Approved General Education Viewing a Wider World ECON elective.....	3
Mathematics elective**.....	3
Mechanical engineering electives***.....	6

*Mechanics elective must be taken from M E 331, 332, or 333.

**Mathematics electives must be taken from MATH 391, 471, 472, 473, 480, STAT 371, or I E 310.

***Students in their senior year choose 6 credits of M E electives.

SURVEYING ENGINEERING

Associate Professor Steven Frank*, department head

Professor Reilly (emeritus); Associate Professor Burkholder**; Assistant

Professor Wurm***; Adjunct Professors Maestas*

(505) 646-5375

*Licensed Professional Surveyor in New Mexico

**Licensed Professional Surveyor and Professional Engineer in New Mexico

***Licensed Professional Surveyor and in a state other than New Mexico

DEGREE: Bachelor of Science in Surveying Engineering

MINOR: Surveying Engineering

Surveying Engineering involves the application of knowledge to the analysis, design, and execution of surveying and mapping projects and the design of land mapping and information systems. Surveyors rely on an understanding of the science of surveying measurement and analysis, the legal principles of boundary location, the laws related to boundaries and land use, and applicable mathematical and computational theories and principles when performing this work. Positional accuracy, land planning and development concepts pertinent to subdivision of land and property surveys, land record and land tenure concepts, as well as earth-related sciences such as geodesy are each a part of professional surveying. Surveying Engineers work for private surveying or engineering firms, for City, County, State or Federal Highway Departments, for State Lands Commissions, for the US Forest Service and for the US Bureau of Land Management.

The mission of the Department of Surveying Engineering is to provide men and women with the rigorous, fundamental education needed to enter and succeed in the surveying and surveying-related professions.

To accomplish this mission, the surveying engineering department will introduce students to the theory and application of recognized surveying principles. Graduates of the program will

- acquire a sound and fundamental understanding of the scientific, mathematical, and engineering principles underlying technology;
- acquire a breadth and depth of education to understand the economic, legal, political, and social context of surveying activities;
- develop the ability to appropriately collect, analyze, interpret, and apply survey and survey-related data;
- develop the ability to recognize, analyze, and solve survey and survey-related problems;
- acquire the verbal and written skills necessary to contribute productively to society;
- acquire an understanding of responsibilities and ethics of surveying professionals;
- develop the ability to work on interdisciplinary teams; and
- recognize the need for and develop the ability to engage in life-long study and learning.

DEGREE: Bachelor of Science in Surveying Engineering (Total Credits 130)

Math and Science Courses (31 credits)

CHEM 111, General Chemistry I.....	4
GEOL 111G, Survey of Geology, or G EN 260, Geology for Engineers.....	4
MATH 191, Calculus I.....	3
MATH 192, Calculus II.....	3
MATH 280, Linear Algebra.....	3
PHYS 215, Engineering Physics I.....	3
PHYS 215L, Engineering Physics I Lab.....	1
STAT 371, Statistics for Engineers and Scientists I.....	3
Math elective ¹	3
Physics elective ²	4

General Education Coursework (31 credits)

COMM 265G, Principles of Human Communication, or COMM 253G, Public Speaking.....	3
ECON 251G, Principles of Macroeconomics, or ECON 252G, Principles of Microeconomics.....	3
ENGL 111G, Rhetoric and Composition.....	4
ENGL 218G, Technical Communication.....	3
Critical Thinking /Analysis elective.....	3
History elective.....	3
Human Thought and Behavior elective.....	3
Literature or Fine Arts elective.....	3
Viewing a Wider World electives ³	6