College of Engineering

Dean - Lakshmi Reddi, Ph.D., P.E.

Associate Dean (Academic Programs) - Antonio (‘Tony’) García, Ph.D.

Associate Dean (Research) - Hongmei Luo, Ph.D.

Associate Dean (Outreach and Recruitment) - Patricia Sullivan, Ph.D.

Assistant Dean (Student Success and Experiential Learning) - Gabe García, Ph.D.

College Chief of Staff - Linda Fresques

Program Manager for Student Success - Tony McClary

The College of Engineering comprises six departments:

- Chemical Engineering;
- Civil Engineering;
- Electrical and Computer Engineering;
- Engineering Technology and Surveying Engineering;
- Industrial Engineering;
- Mechanical and Aerospace Engineering.

Mission of the College of Engineering

The College of Engineering will uphold the land grant mission of NMSU through nationally recognized programs in education, research and professional and public service.

With respect to our undergraduate programs, we will accomplish our mission by focusing on the following goals:

1. To be nationally and internationally recognized for academic and research programs in engineering and engineering technology.
2. Provide world-class engineers and engineering technologists for industrial, government, and academic constituents of the College of Engineering.
3. To be the University of Choice for undergraduate engineering and engineering technology education in the region.
4. To serve as an engine for economic development in New Mexico through the advancement of engineering and technology.

Furthermore, graduates receiving baccalaureate degrees will demonstrate:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Undergraduate Student Advisement

Starting with the fall 2017 semester, students entering the College of Engineering will be advised by the Center for Academic Advising and Student Support (CAASS) located in Garcia Annex. Students may also change majors at the CAASS. Students uncertain about choosing a major may list themselves as undeclared in the College of Engineering and be advised by the CAASS. Undeclared students will be asked to choose a major after two semesters in the college. Students must have a declared major in order to graduate.

At the discretion of the associate dean, students who do not demonstrate satisfactory progress may be required to leave the College of Engineering.

Undergraduate General Education

With the exception of math and science, the college accepts all coursework approved for inclusion in the New Mexico General Education Common Core. Calculus I, General Chemistry I and Engineering Physics I are required to satisfy areas II and III of the common core.

S/U Coursework

The college requires most degree requirements to be taken with traditional grading. Students may take selected humanities and social science courses under the S/U option. Other exceptions are specifically noted in the program descriptions later in this catalog.

Undergraduate Math Placement

Entering freshmen are placed into an appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students with advanced placement or transfer credit for mathematics will be placed accordingly. Math placement may be altered at the discretion of the associate dean.

Minors

Minors are available from most departments within the College of Engineering are outlined in the individual program descriptions.

Undergraduate Cooperative Education

After two semesters of satisfactory academic work (2.5 GPA), an engineering student may go on a work phase with one of the many companies or governmental agencies with which the university has co-op agreements. The experience obtained through alternating periods of academic and fieldwork greatly contributes to the preparation of a student for professional life. Work phases are considered to be a vital part of the educational process, and students are counseled in the selection of co-op positions that will lead to progressive learning experiences. Earnings while on work phase provide a source of financial assistance to meet educational expenses.

A significant number of undergraduate engineering students are in the cooperative education program. Students may, with the approval of their
department head, earn credit while participating in a co-op work phase. Co-op credits do not normally count toward the degree requirements but do show on the transcript.

**Undergraduate General Academic Requirements**

For regular admission to the university and the College of Engineering, incoming freshman and transfer applicants must meet the university's qualifications for regular admission as stated in the undergraduate catalog in effect at the time of application. Students admitted to the College of Engineering will be classified by the college as a pre-[major] until the standard requirements described below for admission to the program major are met.

Pre-[major] students will be admitted into their respective programs once they have met the following criteria:

- Earn a minimum grade of C- in all of the following courses:

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<thead>
<tr>
<th>Prefix</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>CHEM 1215G</td>
<td>General Chemistry I Lecture and Laboratory</td>
<td>4</td>
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<tr>
<td></td>
<td>for STEM Majors</td>
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<tr>
<td>or CHEM 1120G (engineering technology)</td>
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<tr>
<td>ENGL 1110G/1110H/1110M</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENGR 100G</td>
<td>Introduction to Engineering</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1511G</td>
<td>Calculus and Analytic Geometry I</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 1430G (engineering technology)</td>
<td></td>
<td></td>
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<tr>
<td>PHYS 1310G</td>
<td>Calculus -Based Physics I</td>
<td>3</td>
</tr>
<tr>
<td>or PHYS 1230G (engineering technology)</td>
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Any of the above courses with earned AP credit (minimum score of 3) is exempt from the list. Transfer students may meet this criteria with determined passing credit of equivalent courses. PRE [major] students will be advised by their EG [major] department.

NMSU College of Engineering reserves the right to independently test any student's English proficiency upon arrival, including those who have earned scores satisfying minimum admission criteria. If the demonstrated level of English proficiency is not sufficient for academic success as determined by the Center for English Language Programs, support classes may be required to improve proficiency.

Students must earn a minimum cumulative GPA of 2.0 before enrolling in engineering courses numbered 300 or above.

Students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree and also courses taken to satisfy the general education requirements for Area I-Communications, Area II-Mathematics/Algebra, and Area III-Laboratory Science. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately during the next semester it is offered. An undergraduate student may attempt an engineering, math, or physical science course no more than three times to earn a passing grade of C- or better. Anytime a student earns less than a C-, a meeting with the appropriate engineering academic advisor is required to develop a plan for addressing this issue. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an engineering major and will be counseled on other degree options.

**Engineering Transfer Policy**

Policy for engineering majors enrolling in courses at other institutions to meet College of Engineering Departmental Core Requirements

1. NMSU Policy Manual Chapter 6, section 89, paragraph A. “The decision to award a student credit for work completed at another institution rests with the faculty.”
2. NMSU main campus engineering majors may take core classes at other institutions of higher education to meet NMSU College of Engineering Departmental Core if the NMSU core course cannot accommodate any more eligible students.
3. The following conditions and restrictions apply to any course not taken on the NMSU main campus.
   - The department must approve the course prior to enrollment (student to provide course syllabus and any other documentation to department head).
   - The course must be a class in a program that is accredited by an accreditation commission of ABET, Inc. and cannot be graded S/U.
   - The course must be substantially the same as the equivalent NMSU class and the student must have satisfied all NMSU prerequisite requirements.
   - The student shall provide a corresponding course syllabus and any other documentation required.
   - If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.
4. In addition to 3 above, the following conditions apply to any on-line course not taken from the NMSU main campus.
   - Scheduled exams, if any, shall be proctored.
   - If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.

1 Core requirements are defined as required departmental, discipline-related, courses within the major.
2 The student may choose to have NMSU proctor exams (http://distance.nmsu.edu/faculty/requiring-a-proctored-exam/)

For more information about transferring to New Mexico State University from another accredited institution, visit the NMSU Transfer Center.

**Requirements for Graduation**

The minimum requirements for undergraduate degrees are:

1. Satisfaction of the university requirements as previously outlined in the Regulations section of this catalog.
2. Satisfaction of the college requirements as outlined under General Academic Requirements, above.
3. Satisfaction of the departmental rules and course requirements as outlined in the individual program descriptions.

NOTE: In order to maintain quality, remain current, and satisfy changes in accreditation criteria, requirements which have been published may be changed. Any such changes will be announced and will not be retroactive. Always consult an academic advisor before registering for classes.
Master’s Accelerated Program

Students who have a GPA of 3.0 or more are eligible for the Master’s Accelerated Program (MAP) in engineering. The MAP allows a student to earn both a bachelor’s and master’s degree in as little as five years.

A master’s degree is increasingly becoming the professional degree of choice for engineering practice. Many employers encourage, or even require, their employees to seek the degree during their early career, and master’s holders often experience increased upward mobility and earn substantially greater salaries as a result.

General requirements:
- It takes 30 to 32 credit hours to complete a master’s degree.
- Up to 12 credits of your undergraduate coursework 450 and above may be counted toward the master’s.
- It’s possible to complete the master’s degree in 2-3 semesters beyond graduation with a bachelor’s degree.

Visit the Master’s Accelerated Program MAP page for more information.

Graduate Degrees

Graduate study is available in
- Advanced Manufacturing (p. 3).
- Aerospace Engineering.
- Chemical Engineering.
- Civil Engineering.
- Electrical Engineering.
- Environmental Engineering.
- Industrial Engineering and
- Mechanical Engineering.

See individual program descriptions for graduate degree requirements.

Bachelor Degrees

Bachelor of Information and Communication Technology.

Bachelor of Science in Engineering

Majors in:
- Aerospace Engineering
- Chemical Engineering
- Civil Engineering
  - Civil Engineering (Environmental)
  - Civil Engineering (General)
  - Civil Engineering (Geotechnical)
  - Civil Engineering (Structural)
  - Civil Engineering (Water Resources)
- Electrical Engineering - Bachelor of Science in Electrical Engineering
  - Electrical Engineering (Communications & Signal Processing)
  - Electrical Engineering (Computers & Microelectronics)
  - Electrical Engineering (Control & Power)
  - Electrical Engineering (Electromagnetics & Photonics)
  - Electrical Engineering (Space Systems)
- Engineering Physics
  - Aerospace
  - Chemical
- Engineering Technology - Civil
  - Construction Technology
  - Geomatics
  - Renewable Energy Technologies
  - Transportation Technology
  - Water/Wastewater Technology
- Engineering Technology - Electronics and Computer
  - Digital Forensics
  - Information Security Technology
  - Renewable Energy Technologies
- Engineering Technology - Information
  - Information Security Technology
- Engineering Technology - Mechanical
  - Renewable Energy Technologies
- Geomatics
  - Industrial Engineering
  - Mechanical Engineering

Masters Degrees

The College of Engineering offers three types of Master’s curriculum: thesis, project or coursework-only. The Master of Science (M.S.) degree is completed either with a thesis or a project. The Master of Engineering (M.E.) degree is completed without the preparation of a formal research thesis or project and is based only on coursework. Students interested in research and a career in R&D may prefer the M.S. thesis option, while students who select the M.E. degree may be more interested in acquiring knowledge and applying it in their professional workplace.

Departmental Master of Science

Master of Science in Aerospace Engineering

Master of Science in Chemical Engineering

Master of Science in Civil Engineering

Master of Science in Electrical Engineering

Master of Science in Environmental Engineering

Master of Science in Industrial Engineering

Master of Science in Mechanical Engineering

Departmental Master of Engineering
(Coursework Only)

Majors in:
- Aerospace Engineering
- Chemical Process Industry
- Civil Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering
Advanced Manufacturing - Concentration

The graduate concentration in advanced manufacturing educates students and creates a skilled workforce for the growing needs of new technologies and advanced products in the 21st century. The program provides hands-on experience on designing, adapting, and building parts using advanced materials by including new processes, changing the supply chain, and adapting business models. It also includes the design optimization, materials selection and characterization, process parameter mapping, data analytics, software development, and final part inspection among other concepts. This concentration is maintained by the College of Engineering but is open to any Master's level major/degree.

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<tr>
<th>Prefix</th>
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<tbody>
<tr>
<td>I E 575</td>
<td>Advanced Manufacturing Processes</td>
<td>3</td>
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<tr>
<td>I E 571</td>
<td>Advanced Quality Control</td>
<td>3</td>
</tr>
<tr>
<td>C E 510</td>
<td>Introduction to Nondestructive Testing</td>
<td>3</td>
</tr>
<tr>
<td>CHME 564</td>
<td>Polymer Science &amp; Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHME 491/AGRO 450</td>
<td>Special Topics (AGRO 450 CHME 491 Development of Agricultural Technologies)</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

5 Electives (Select 500 Level Courses from EE, CHME, IE, CE, or MAE) ¹ 15

Total Credits 30

¹ With Approval of the advisor and instructor

Selection of Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student’s advisor.

Although there is no oral exam, students will be required to complete an exit-interview with one of Advanced Manufacturing concentration and one graduate faculty member from the master of engineering they select to study.

Doctoral Degree

Doctor of Philosophy

Majors in:

• Aerospace Engineering
• Engineering
  • Chemical Engineering
  • Civil Engineering
  • Electrical Engineering
  • Industrial Engineering
  • Mechanical Engineering

Graduate Certificates

Digital Communications - Graduate Certificate
Digital Signal Processing - Graduate Certificate
Electric Energy Systems - Graduate Certificate
Systems Engineering - Graduate Certificate
Telemetry - Graduate Certificate

Undergraduate Minors

• Aerospace Engineering
• Agricultural Engineering
• Biomedical Engineering
• Brewery Engineering
• Computational Engineering
• Computer Engineering
• Digital Electronic Applications
• Digital Forensics
• Electrical Engineering
• Entrepreneurship
• Environmental Engineering
• Geomatics
• Information Security Technology
• Manufacturing
• Materials Engineering
• Mechanical Engineering
• Nuclear Chemical Engineering
• Pre-Law in Intellectual Property
• Pre-Medicine Studies
• Renewable Energy Technologies
• Structural Engineering

Graduate Minor

• Materials Engineering

Accreditation

The following programs are accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org/.

• Aerospace Engineering,
• Chemical Engineering,
• Civil Engineering,
• Electrical Engineering,
• Engineering Physics,
• Geomatics
• Industrial Engineering,
• Mechanical Engineering, and

The following programs are accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org/.

• Engineering Technology – Civil
• Engineering Technology – Electronics and Computer
• Engineering Technology – Information
• Engineering Technology – Mechanical
The college is a member of the American Society for Engineering Education (ASEE).

Other programs under the College of Engineering, such as Information and Communications Technology, are accredited under the Higher Learning Commission (HLC) institutional accreditation.

New Mexico State University has been accredited by The Higher Learning Commission (HLC) since 1926. The HLC may be contacted at:

The Higher Learning Commission  
230 North LaSalle St., Suite 7-500  
Chicago, IL 60604-1411  
Phone: (800) 621-7440  

ASEE).