

# CIVIL ENGINEERING

## Undergraduate Program Information

### Mission Statement

The mission of the Civil Engineering Department for the undergraduate program is to offer a high-quality accredited Bachelor of Science (B.S.) degree that prepares our graduates for professional licensure leading to successful civil engineering careers in the industry and government, and for success in graduate education. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to student learning and development, and serve as role models to the undergraduate students.

Continued excellence in our undergraduate program is paramount to our mission by providing a strong technical foundation to our graduates for engineering design and problem solving; preparing quality graduates for licensure and professional careers in civil engineering; implementing modern and effective learning methods; maintaining close student-faculty learning interactions; and instilling life-long learning skills and goals for professional growth after graduation.

### Program Educational Objectives

Through NMSU's high-quality accredited civil engineering program, graduates will:

1. Be successfully employed in civil engineering or related careers and will become independent thinkers, ethical leaders, effective communicators, and collaborative professionals.
2. Be prepared to pursue professional licensure, appropriate certifications, graduate degrees, and/or professional development activities by fostering life-long learning skills and strategies.
3. Be competitive with graduates from programs across the world through their experience interacting with recognized faculty and industry professionals, and excelling in intercollegiate activities.
4. Build on fundamental knowledge and apply technical skills across disciplines in civil engineering and related fields to make data-driven decisions using engineering judgement.

### Program Criteria

The Civil Engineering curriculum is developed based on the program criteria established collaboratively by the Engineering Accreditation Commission (EAC) of ABET Inc. and the American Society of Civil Engineers (ASCE). The curriculum specifically prepares civil engineering students at the baccalaureate level to graduate with the ability to:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, general chemistry, and probability and statistics to assess uncertainty.
2. Analyze and solve problems in various areas of civil engineering.
3. Conduct experiments associated with civil engineering, as well as analyze and interpret the collected data.
4. Design a system, component, or process in various civil engineering contexts considering sustainability.
5. Explain basic concepts related to project management, business, public policy, and leadership.
6. Analyze issues related to professional ethics and explain the importance of professional licensure.

In accordance with the program criteria of ABET and ASCE, the Civil Engineering faculty responsible for teaching design-oriented courses are qualified in their respective professional areas by means of licensure, or a combination of education and design experience. Furthermore, the faculty are given responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

## Graduate Program Information

### Mission Statement

The mission of the Civil Engineering Department regarding graduate education is to provide research-based and practice-oriented post-baccalaureate programs leading to Master of Science (M. S.), Master of Engineering (M. E.), and PhD degrees for students in the areas of environmental, geotechnical, structural, transportation, and water resources engineering. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to student learning and development, scholastic and research excellence, and professional service.

Continued excellence in our graduate program is paramount to our mission by providing advanced academic and technical foundations to our graduates; providing interdisciplinary and collaborative research opportunities and teaching experiences; implementing learning methods that promote critical-thinking and problem-solving; seeking external funding to support innovative research and graduate assistantships; and fostering an intellectual and creative environment that values diversity (of people, research and interests) and research ethics.

The Civil Engineering Department offers excellent opportunities for advanced study and professional training in several fields leading to the M.E. in Civil Engineering, M.S. in Civil Engineering, M.S. in Environmental Engineering, and Ph.D. degrees. Students work closely with the faculty on contemporary issues including, but not limited to, applications of machine / deep learning, biogeotechnologies, evapotranspiration monitoring of crops and riparian vegetation, ground stabilization, groundwater recharge, high performance materials, non-destructive testing and evaluation, remote sensing, renewable energy, resilient infrastructure, reservoir evaporation monitoring, riparian rehabilitation, structural health monitoring, sustainable construction, and water treatment and reuse.

The department has excellent facilities for teaching and research purposes including laboratories for mechanical, chemical and biological research. In addition, the department conducts research at various field sites located throughout New Mexico in collaboration with local, state, and federal agencies. Noteworthy features of the graduate programs are the energetic, highly motivated faculty and the low student-faculty ratio. The department regularly has several ongoing research projects of various size and scope employing graduate and undergraduate students. Teaching and research assistantships are available to qualified students and office space is normally provided to M.S. thesis and PhD students.

Students enrolling for graduate studies in civil engineering must have received a bachelor's degree in engineering or one of the allied fields. A candidate for the M.S. in Civil Engineering or M.S. in Environmental Engineering degree may choose either a thesis or a non-thesis track. The M.E. in Civil Engineering degree requires only coursework. When a student enrolls for the Ph.D. program, a doctoral committee is formed to assist the student in planning a program appropriate to the student's background and goals and to administer the required examinations. All Ph.D. candidates in civil engineering must have a demonstrated proficiency in English and two research tools. Mutual understanding

between the Ph.D. candidate and his or her doctoral committee on the final nature of these two research tools will be on an individual basis.

### **Master's Accelerated Program**

The Master's Accelerated Program (MAP) option provides students the opportunity to complete a B.S. in Civil Engineering and a master's degree (M.E. in Civil Engineering, M.S. in Civil Engineering or M.S. in Environmental Engineering) with 144 to 150 credit hours; the non-accelerated path requires 156 credit hours (B.S. requires 126 credit hours plus the M.E. or M.S. which require 30 credit hours each). Students accepted into this program will follow the normal path of the Civil Engineering undergraduate curriculum, of which up to 12 credit hours comprised of senior-level (> 450) and/or graduate-level (> 500) courses will be counted towards the master's degree; the MAP courses must be approved by the department head and completed with a grade of B or better. When students receive their bachelor's degree in Civil Engineering, there are 18 to 24 credit hours left for the master's degree which can be completed in 2 to 3 semesters for full-time students. Students must apply for admission during the final semester of their junior year and obtain prior approval by the department head to pursue the MAP option.