

CIVIL ENGINEERING (ENGINEERING)

Integrated Undergrad-Grad Programs

Integrated B.S. in Civil Engineering and M.Eng. or M.S. in Civil Engineering

This Integrated Undergraduate/Graduate (IUG) degree program combines the B.S. in Civil Engineering with the M.Eng. or M.S. in Civil Engineering offered at the following campuses:

Undergraduate Degree

- University Park

Graduate Degree

- University Park

Requirements listed here are in addition to requirements listed in GCAC-210 Integrated Undergraduate-Graduate (IUG) Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-210-integrated-undergraduate-graduate-degree-programs/>).

The Department of Civil and Environmental Engineering (CEE) offers an Integrated Undergraduate-Graduate (IUG) degree program for our undergraduate students to pursue either a professional Master of Engineering (M.Eng.) degree or a research Master of Science (M.S.) degree. A Master's degree in Civil Engineering enhances technical expertise and problem-solving skills of the graduates, provides specialization in a CEE subdiscipline, and prepares graduates for leadership roles in complex infrastructure projects. It provides a competitive edge in the job market over bachelor's degree holders, and opens doors to accelerated career growth, higher earning potential, and more advanced job opportunities in both the public and private sectors. It also provides a pathway to Professional Engineer (PE) licensure, international opportunities, and research/Ph.D. studies. This IUG program allows CE undergraduate students to earn both B.S. and Master's degrees in a targeted five years, which is normally less than the time required for the separate degree programs. CE undergraduate students admitted to the integrated program must maintain a cumulative grade point average (GPA) of 3.30 or higher until completion of the B.S. degree. The actual time required is determined by the individual student's objectives, needs, and diligence. A maximum of 12 credits may be shared in both the undergraduate and graduate degree programs, i.e., "double counted." An admitted IUG student will begin the senior year working towards the B.S. and Master's degrees. The student will follow the course scheduling of the B.S. major while also taking 500-level graduate courses, whenever appropriate, to satisfy the Master's degree requirements. An IUG student is expected to receive the B.S. degree in the fourth year and continue to work towards satisfying all degree requirements for the Master's degree in the fifth year. The student will select one of the four specialty areas in CE for their Master's degree:

- Geotechnical and Materials Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering

Admission Requirements

Applicants apply for admission to the program via the J. Jeffrey and Ann Marie Fox Graduate School application for admission (<https://gradschool.psu.edu/admissions/how-to-apply>). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (<https://gradschool.psu.edu/graduate-education-policies/>).

Students must apply to the program via the Graduate School's Electronic Application Portal (<http://www.gradschool.psu.edu/prospective-students/how-to-apply/>), and must meet all the admission requirements of the Graduate School and the Civil Engineering graduate program for the M.Eng. or M.S. degree, listed in the Admission Requirements section. Before applying to the Graduate School, students must have completed entrance to their undergraduate major and have completed no less than 60 credits. Students would typically apply after completing the fifth semester and before the end of the sixth semester, and must be admitted no later than the end of the second week of the semester preceding the semester of expected conferral of the undergraduate degree. Transfer students must have completed at least 15 credits at Penn State to enroll in an IUG. The IUG application should follow the CEE graduate application (<https://www.cee.psu.edu/academics/graduate/how-to-apply.aspx>) instructions and the following requirements:

1. A Statement of Purpose and resume (uploaded as one document), which should include the student's name, PSU student ID number, undergraduate major(s), current cumulative GPA, and intended area of study (Geotechnical and Materials Engineering, Structural Engineering, Transportation Engineering, or Water Resources Engineering). The Statement of Purpose should cover the student's academic goals and summarize the student's academic experience to date that justifies consideration of the IUG program. The statement should demonstrate the student's scholarly ability, communication skills, and potential success in graduate study.
2. A minimum of two letters of recommendation submitted electronically by faculty or employers elaborating on why the applicant should be considered for graduate studies. For students applying to the M.S. program, one of these letters must be written by the prospective graduate advisor, who should further address the details of the proposed area of research and the student's ability to conduct the proposed work.
3. Under "Select Admission Type" of the online application form, check the box indicating you are applying to an IUG Program.
4. Plan of Study that covers the five-year IUG period, prepared in consultation with the prospective CE graduate advisor or CEE Director of Graduate Studies. This Plan of Study must be approved by the Director of the CEE Undergraduate Program and the prospective graduate advisor.

DEGREE REQUIREMENTS

The degree requirements will be in accordance with the approved requirements of the B.S. degree (listed in the Undergraduate Bulletin (<https://bulletins.psu.edu/undergraduate/colleges/engineering/civil-engineering-bs/>)) and either the M.Eng. or M.S. degree in Civil Engineering (listed on the Degree Requirements tab (<https://bulletins.psu.edu/graduate/programs/majors/civil-engineering/#degree requirementstext>)). Up to 12 credits may be double counted toward the degree requirements of both the undergraduate and graduate degree programs. The 12 credits may be a combination of 400-, 500-, and 800-level courses; a minimum of 6 double-counted credits must be at the 500 or 800 level. Double-counted courses are selected based

on the CE disciplinary areas (Geotechnical and Materials Engineering, Structural Engineering, Transportation Engineering, or Water Resources Engineering) and should be approved by the student's graduate advisor, the CEE Director of Undergraduate Studies, and the CEE Director of Graduate Studies. Undergraduate capstone credits, independent study courses, and credits associated with the culminating experience for the graduate degree (such as thesis) cannot be double counted.

Student performance will be monitored on an on-going basis. A formal evaluation of the IUG student's academic performance will be conducted at the end of the first semester of the senior year. Students who have not maintained a cumulative **3.3 GPA** in Civil Engineering will be put on probationary status with respect to the IUG program. Their ability to continue in the IUG program will be based on academic performance in the last semester of their fourth year. As part of the review in the fourth year, students will be advised about the degree requirement in the graduate program. In addition, students must maintain a minimum retention GPA of 3.00 or better in 400-, 500-, 800-level courses listed on their Plan of Study for the Master's degree. The plan should be reviewed periodically with an adviser as the student advances through the program, and any changes to a student's course plan must receive approval from their academic adviser and the CEE Director of Graduate Studies.

Students must fulfill all degree requirements for each degree (B.S. and Master's) to be awarded that degree, subject to the double counting of credits. IUG students must sequence their courses so that all undergraduate degree requirements are fulfilled before taking courses to count solely towards the graduate degree. Students must complete the undergraduate degree requirements within the typical time to degree for the undergraduate major. In the semester in which the undergraduate degree requirements will be completed, IUG students must apply to graduate, and the undergraduate degree should be conferred at the next appropriate Commencement. IUG students have a maximum six-year time limit for completion of the B.S. and Master's degrees. Any extension beyond six years requires the approval of the CEE Director of Graduate Studies. If for any reason a student admitted to the IUG program is unable to complete the requirements for the Master's degree, the student will be permitted to receive the B.S. degree assuming all the undergraduate degree requirements have been satisfactorily completed.

The courses that can double count for the B.S. and M.Eng./M.S. are as follows for each CE disciplinary area:

Code	Title	Credits
COURSES ELIGIBLE TO DOUBLE COUNT FOR BOTH DEGREES (GEOTECH. AND MATERIALS ENGR.)		
CE 402	Computing Methods for Civil and Environmental Engineering	3
CE 403	Energy Use, Climate Change, and Our Engineered Infrastructure	3
CE 435	Foundation Engineering	3
CE 436	Construction Engineering Materials	3
CE 512	Soil Mechanics II	3
CE 584	Concrete Materials and Properties	3
STAT 500	Applied Statistics	3
STAT 501	Regression Methods	3
COURSES ELIGIBLE TO DOUBLE COUNT FOR BOTH DEGREES (STRUCTURAL ENGINEERING)		
CE 402	Computing Methods for Civil and Environmental Engineering	3

CE 404	Probabilistic Modeling and Machine Learning for Civil and Environmental Engineering	3
CE 447	Structural Analysis by Matrix Methods	3
CE 538	Earthquake Resistant Design of Buildings	3
CE 541	Structural Analysis	3
CE 544	Design of Reinforced Concrete Structures	3
CE 545	Metal Structure Behavior and Design	3
CE 548	Structural Design for Dynamic Loads	3
CE 549	Bridge Engineering I	3
CE 566	Uncertainty and Reliability in Civil Engineering	3
STAT 500	Applied Statistics	3
STAT 501	Regression Methods	3

COURSES ELIGIBLE TO DOUBLE COUNT FOR BOTH DEGREES (TRANSPORTATION ENGINEERING)

CE 422	Transportation Planning	3
CE 423	Traffic Operations	4
CE 525	Transportation Operations	3
CE 528	Transportation Safety Analysis	3
STAT 500	Applied Statistics	3
STAT 501	Regression Methods	3

COURSES ELIGIBLE TO DOUBLE COUNT FOR BOTH DEGREES (WATER RESOURCES ENGINEERING)

CE 402	Computing Methods for Civil and Environmental Engineering	3
CE 403	Energy Use, Climate Change, and Our Engineered Infrastructure	3
CE 461	Water-resource Engineering	3
CE 462	Open Channel Hydraulics	3
CE 473	Ecological Design of Regenerative Aquatic Systems	3
CE 555	Groundwater Hydrology: Analysis and Modeling	3
CE 561	Surface Hydrology	3
CE 566	Uncertainty and Reliability in Civil Engineering	3
CE 567	River Engineering	3
CE 587	Computational Ecohydrology	3
STAT 500	Applied Statistics	3
STAT 501	Regression Methods	3