Bachelor of Science in Engineering Technology

Engineering Technology with a Major in Civil Engineering Technology (BSET)

Web Site: https://ww1.odu.edu/engtech.html

Civil Engineering Technology

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The Bachelor of Science in Engineering Technology (BSET) degree program has courses at the senior level specializing in the areas of construction management, structural design, and site development. Students in this program are prepared for employment in a wide range of professional and technical positions with the construction, consulting engineering, surveying and site development industries. Graduates are eligible to take the Fundamentals of Engineering exam, the first step to licensure as a professional engineer. CET courses include topics such as computer-aided drafting, statics, strength of materials, materials testing, surveying, building construction, steel and concrete design, soils and foundations, and hydrology and drainage. Effective written, oral, and graphic communications are practiced throughout the curriculum along with computer literacy. The program culminates in a senior project that integrates coursework with a practical project assignment in the student's area of interest. To satisfy the upper-division general education requirements, students are encouraged to complete a minor in engineering management, business management, environmental health and safety, or mechanical engineering technology.

Civil Engineering Technology Program

Mission Statement

The mission of the Civil Engineering Technology (CET) program is to sustain a high-quality undergraduate program of study leading to the Bachelor of Science in Engineering Technology degree. The program prepares graduates to become certified in their area of specialization. Civil engineering technology is a significant component of the University's commitment to science, engineering, and technology, particularly in structural design, construction, site development and related fields, which are of major importance to civilization. Students around the world are enabled to expand opportunities to enhance their education and pursue baccalaureate-level studies through ODUGlobal. Simultaneously, the program supports the general education components that yield a well-rounded graduate aware of and able to address societal needs and issues.

Typical technical problems that CET graduates will be able to address include building and non-building type structures and construction operations. Typical technical tasks the CET graduates will be expected to perform include planning and design, field testing and inspection, on-site technical coordination and control, and other tasks relevant to one's emphasis area.

Program Educational Objectives

The objective of the civil engineering technology program is to prepare graduates to establish themselves as successful professionals in structural design, site development, and construction management or related areas during the first few years of their careers by having demonstrated their ability to:

1. Identify and solve increasingly complex technical problems, both theoretically and practically, as raised by continually evolving technologies and industry needs and practices.
2. Make educated, responsible, and ethical decisions in response to the profession's and society's needs, with these decisions solidly grounded in science and engineering fundamentals.
3. Work effectively as a member or leader of technical teams and clearly communicate ideas leading to successful team outcomes.

Student Outcomes

After deliberations by its constituents, the civil engineering technology program has adopted five student outcomes for the Bachelor of Science degree program in civil engineering technology. These outcomes are listed below.

1. an ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline;
2. an ability to design systems, components, or processes meeting specified needs for broadly defined engineering problems appropriate to the discipline;
3. an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
5. an ability to function effectively as a member, as well as, a leader on technical teams.

Accreditation

The Bachelor of Science in Engineering Technology - Civil Engineering Technology is accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, https://www.abet.org (https://www.abet.org/), under the General Criteria and the Civil Engineering Technology Program Criteria.

Graduates of CET programs typically analyze and design systems, specify project methods and materials, perform cost estimates and analyses, and manage technical activities that support civil engineering projects. The curriculum provides instruction in the following curricular areas:

1. utilization of principles, hardware, and software that are appropriate to produce drawings, reports, quantity estimates, and other documents related to civil engineering technology;
2. performance of standardized field and laboratory tests related to civil engineering technology;
3. utilization of surveying methods appropriate for land measurement and/or construction layout;
4. application of fundamental computational methods and elementary analytical techniques in sub-disciplines related to civil engineering technology;
5. planning and preparation of documents appropriate for design and construction;
6. performance of economic analyses and cost estimates related to the design, construction, operations, and maintenance of systems associated with civil engineering technology;
7. selection of appropriate engineering materials and practices; and
8. performance of standard analysis and design in at least three sub-disciplines related to civil engineering technology.

Requirements

Lower-Division General Education

Written Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written)	6
Oral Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral)	3
Mathematics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math)	3
Language and Culture (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language)	0-6

Information Literacy and Research (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information)	3
Human Behavior (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior)	3
Human Creativity (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)	3
Interpreting the Past (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)	3
Literature (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)	3
Philosophy and Ethics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy)	3
The Nature of Science (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature)	8
Impact of Technology (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact)	3

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met though the major.

Upper-Division General Education

- Option A: Any University-approved disciplinary minor (minimum of 12 hours), second degree, or second major.
- Option B: Any University-approved interdisciplinary minor (12 credit hours, 3 of which may be in the major).
- Option D: Two Upper-Division Courses (6 credit hours) from outside the College of Engineering and Technology and not required by the major.

Requirements for Graduation

Requirements for graduation include the following:

- Minimum of 120 credit hours.
- Minimum of 30 credit hours overall and 12 credit hours of upper-level courses in the major program from Old Dominion University.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward the major.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward a minor.
- Completion of ENGL 110C, ENGL 211C or ENGL 231C, and the writing intensive (W) course in the major with a grade of C or better. The W course must be taken at Old Dominion University.
- Completion of Senior Assessment.

Civil Engineering Technology Grade Requirements

Critical CET course sequences within the Civil Engineering Technology curricula require a minimum grade of C before progressing to subsequent courses. A grade of C- does not satisfy the requirement for a C grade.

The following courses require a minimum grade of C:

ENGL 110C	English Composition	3
ENGL 211C	Writing, Rhetoric, and Research	3
or ENGL 231C	Writing, Rhetoric, and Research: Special Topics	
MATH 162M	Precalculus I	3
MATH 163	Precalculus II	3
MATH 211	Calculus I	4
ENGT 435W	Senior Design Project	3
ENGT 220	Strength of Materials	3
ENGT 200	Statics	3

Civil Engineering Technology Major

General Education	
Complete lower-division requirements	32-38
Complete upper-division requirements (minimum of 6 credits)	6
Civil Engineering Technology Major	
Complete civil engineering technology departmental and major requirements as shown on the degree program guide	83
Total Credit Hours	**121-127**

Degree Program Guide [1]

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Critical CET course sequences within the Civil Engineering Technology curricula require a minimum grade of C before progressing to subsequent courses. Refer to the individual CET course descriptions for information on specific C grade prerequisites. A grade of C- does not satisfy the requirement for a C grade.

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 121	Introduction to Engineering and Technology	4
MATH 162M	Precalculus I (grade of C or better required)	3
ENGL 110C	English Composition (grade of C or better required)	3
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
	Credit Hours	**14**
Spring		
MATH 163	Precalculus II (grade of C or better required)	3
PHYS 111N	Introductory General Physics	4
ENGN 122	Computer Programming for Engineering	4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	**14**
Sophomore		
Fall		
ENGT 200	Statics (grade of C or better required)	3
CET 120	Civil 2D Computer Aided Drafting	2
CET 210	Fundamentals of Building Construction	3
MATH 211	Calculus I (grade of C or better required)	4
PHYS 112N	Introductory General Physics	4
	Credit Hours	**16**

Spring		
ENGT 220	Strength of Materials (grade of C or better required)	3
CET 205	Principles of Surveying	3
CET 221	Material Testing Laboratory	1
CET 260	CAD for Building Applications	2
COMM 101R	Public Speaking	3
Human Behavior (S)		3
	Credit Hours	**15**
Junior		
Fall		
CET 265	Civil 3D CAD	2
CET 301	Introduction to Structural Design	4
CET 330	Fluid Mechanics	4
CET 355	Sustainable Building Practices	3
Human Creativity (A)		3
	Credit Hours	**16**
Spring		
CET 340	Soils and Foundations	3
CET 341	Soil Testing Laboratory	1
CET 361	Construction Project Management	3
Approved CET Elective [4]		3
ENMA 302	Engineering Economics	3
Literature (L)		3
	Credit Hours	**16**
Senior		
Fall		
ENGT 434	Introduction to Senior Design Project	3
Approved CET Elective [4]		3
Approved CET Elective [4]		3
Upper Division Gen Ed [3]		3
Historical Perspective (Interpreting the Past, H)		3
	Credit Hours	**15**
Spring		
ENGT 435W	Senior Design Project (grade of C or better required)	3
Approved CET Elective [4]		3
Approved CET Elective [4]		3
ENMA 480	Ethics and Philosophy in Engineering Applications [2]	3
Upper Division Gen Ed [3]		3
	Credit Hours	**15**
	Total Credit Hours	**121**

1 Does not include the University's General Education language and culture requirement. Additional hours may be required.

2 Meets the philosophy and ethics general education requirement.

3 Additional courses will be required to complete a minor. See advisor for details.

4 Construction Management electives are: CET 365, CET 460, CET 462, CET 467, and CET 472.
Site Development electives are: CET 325, CET 332, CET 420, and CET 430.
Structural Design electives are: CET 400, CET 402, CET 405, CET 410, CET 412, CET 414, and CET 417.
Resilience and Sustainability electives are: CET 332, CET 420, CET 456, CEE 457, CET 458.

Civil Engineering Technology (CET) Approved Senior Electives

CET 325	Introduction to Land Development	3
CET 332	Water Resources Engineering	3
CET 334	Computer Applications in Hydraulic Engineering	3
CET 365	Building Information Modeling (BIM)	3
CET 400	Computer Applications in Structural Design	3
CET 402	Structural Steel Design (Replaces old CET 450)	3
CET 405	Environmental Loads	3
CET 410	Reinforced Concrete Design	3
CET 412	Wood Design (Replaces old CET 452)	3
CET 414	Bridge Design (Replaces old CET 485)	3
CET 417	Design of Reinforced Concrete Foundations (Replaces old CET 435)	3
CET 420	Hydrology and Drainage	3
CET 428	Buried Infrastructure	3
CET 430	Hydraulic Engineering	3
CET 456	Resilience and Sustainability	3
CET 458	Managing the Climate Crisis	3
CET 460	Construction Cost Estimating	3
CET 462	Construction Planning and Scheduling	3
CET 467	Construction Finance and Equipment Utilization	3
CET 472	Contract Documents (Replaces old CET 445)	3
CEE 457	Adaptation to Sea Level Rise	3

Linked Bachelor's/Master's Degree Programs

These are designed to allow qualified students to secure a space in a master's program available in the Frank Batten College of Engineering and Technology while they are still pursuing their undergraduate degrees. An eligible student can choose a master's program in the same discipline as his/her bachelor's program or in a complementary discipline. Subject to the approval of the undergraduate and graduate program directors, a student enrolled in a linked program can count up to six credit hours of course work towards both the undergraduate and the graduate degrees. Full-time students may be able to complete the requirements for the bachelor's degree in four years and the master's degree in one additional year. Students in linked programs must earn a minimum of 150 credit hours (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree).

Students who are matriculated in an undergraduate major in the Frank Batten College of Engineering and Technology with a GPA of at least 3.00 overall and 3.00 in the major are eligible to apply for admission to a linked bachelor's/master's program. Transfer students who desire to be admitted to a linked program at the time they join an undergraduate major at Old Dominion University are eligible to apply if their overall GPA at their previous institution is 3.25 or higher. Prerequisite courses may be required for engineering technology majors to pursue a master's degree in engineering.

Continuance in a linked bachelor's/master's program requires maintenance of a GPA of 3.00 or higher overall and in the major.

Bachelor-to-PhD Programs

For a select number of exceptionally well-qualified students, the college has established a linked doctoral program that enables students to be admitted directly into the PhD program upon completion of the baccalaureate degree. A select number of exceptionally well-qualified students can be admitted to the Bachelor/PhD program in their junior year while they are pursuing one of the undergraduate programs at Old Dominion University. This program encourages admitted students to work closely with faculty members and pursue a research experience. Just as in the linked Bachelor/MS program, six credit hours of graduate course work may again be counted towards the undergraduate degree and doctoral course work mentioned above for the Bachelor/PhD program. For linked bachelor's to doctoral programs, students must earn a minimum of 198 credit hours (120 discrete credit hours for the undergraduate degree and 78 discrete credit hours for the graduate degree). Students in these programs must maintain a GPA of 3.50 or better throughout their bachelor's and doctoral studies.

The student may opt to obtain the master's degree along the way to the doctorate. To obtain the master's degree, the student must utilize the six graduate credits obtained as part of their undergraduate program, use 18 credits of the graduate course work that is part of the PhD, and work with the Graduate Program Director to plan the final 6 credits.