BACHELOR OF SCIENCE IN APPLIED SCIENCE IN CIVIL AND CONSTRUCTION ENGINEERING TECHNOLOGY

Bachelor of Science in Applied Science Degree
(330) 941-3287

Students in the Civil and Construction Engineering Technology (CCET) program may choose to complete two years of study and earn an Associate of Applied Science (AAS) degree. The AAS degree provides early access to employment in engineering support positions. Upon completion of the AAS degree, the student may continue on for the Bachelor of Science in Applied Science (BSAS) degree. This program provides additional coursework, continuing the student’s growth to that of an engineer or engineering designer. Exceptional students may be eligible for enrollment in a Master of Engineering or Master of Business Administration program.

The civil and construction engineering technology programs is based on the "two-plus-two" educational system which provides the flexibility of earning an associate degree and a bachelor’s degree according to his or her needs. After completing the requirements of the associate degree, the student may elect to either enter industry or, through an added two years of full-time study (averaging 17 hours per semester) or equivalent part-time study, earn the Bachelor of Science in Applied Science (BSAS).

Graduates of the BSAS degree program obtain employment as engineers or engineering designers for government agencies, consulting engineers and architects, industry and manufacturing, and contractors. Because their education is more extensive, they are prepared for more responsibility and more-rapid advancement. BSAS engineers design, plan, inspect, and direct construction, production, and maintenance activities.

Based on an evaluation of their work, transfer students who have a related associate degree from a regionally accredited institution may be admitted to the bachelor’s degree program at the junior level.

Program Educational Objectives

Educational objectives for the civil and construction engineering technology programs have been developed by faculty and the program industrial advisory committee to support the university, college, and School of Engineering Technology missions. Graduates of the CCET associate degree program are prepared to support civil engineers in:

- structural design
- public works
- construction
- inspection
- transportation
- environmental engineering

Bachelor’s degree graduates are prepared to assist with planning, design, inspection, and direction of the construction of projects involving buildings, roads, dams, bridges, airports, and wastewater treatment facilities.

During their first few years after earning the civil and construction engineering technology degree at YSU, graduates will have demonstrated the ability to:

- Secure employment in a technical career related to their civil and construction engineering technology degree.
- Communicate effectively in a professional environment.
- Continue growth in professional knowledge and skills.
- Achieve recognition consistent with their educational achievements.

Accreditation and Registration

The civil and construction engineering technology bachelor program is accredited by the ETAC Accreditation Commission of ABET, http://www.abet.org. In most states, including Ohio, West Virginia and Pennsylvania, bachelor’s degree graduates are qualified to take the Fundamentals of Engineering (FE) exam, and, with sufficient work experience, the Professional Engineers (PE) exam. Graduates are also qualified to apply to the National Institute for Certification in Engineering Technologies (NICET) for certification procedures in various specialty areas, depending on academic major and employment area.

Date of last campus visit: October, 2017
Accredited through: 2024
Next campus visit: 2023
Link to accrediting body: ABET (http://www.abet.org/)

<table>
<thead>
<tr>
<th>COURSE</th>
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<tbody>
<tr>
<td>YSU 1500</td>
<td>Success Seminar</td>
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<tr>
<td>or SS 1500</td>
<td>Strong Start Seminar</td>
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<tr>
<td>or HONR 1500</td>
<td>Intro to Honors</td>
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General Education Courses:

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<tr>
<th>COURSE</th>
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<tbody>
<tr>
<td>MATH 1513</td>
<td>Algebra and Transcendental Function</td>
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<tr>
<td>ENGL 1550</td>
<td>Writing 1</td>
<td>3-4</td>
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<tr>
<td>or ENGL 1549</td>
<td>Writing 1 with Support</td>
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<tr>
<td>ENGL 1551</td>
<td>Writing 2</td>
<td>3</td>
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<tr>
<td>CMST 1545</td>
<td>Communication Foundations</td>
<td>3</td>
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<tr>
<td>PHIL 2626</td>
<td>Engineering Ethics</td>
<td>3</td>
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<tr>
<td>or PHIL 2625</td>
<td>Introduction to Professional Ethics</td>
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<td>GER SPA</td>
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<td>GER AH</td>
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</tr>
<tr>
<td>CHEM 1515</td>
<td>General Chemistry 1</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1515L</td>
<td>General Chemistry 1 Laboratory</td>
<td>1</td>
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<tr>
<td>PHYS 1501</td>
<td>Fundamentals of Physics 1</td>
<td>4</td>
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<th>COURSE</th>
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<tbody>
<tr>
<td>MATH 2670</td>
<td>Applied Calculus 2</td>
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<tr>
<td>MATH 1570</td>
<td>Applied Calculus 1</td>
<td>4</td>
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<tr>
<td>ENTC 1505</td>
<td>Engineering Technology Concepts</td>
<td>4</td>
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<tr>
<td>CCET 1503</td>
<td>CAD Technology</td>
<td>2</td>
</tr>
<tr>
<td>CCET 1504</td>
<td>Drafting and Plan Reading</td>
<td>2</td>
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<tr>
<td>MET 1515</td>
<td>Mechanics 1</td>
<td>3</td>
</tr>
<tr>
<td>CCET 2604</td>
<td>Properties and Strength of Materials</td>
<td>3</td>
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<tr>
<td>CCET 2614L</td>
<td>Materials Laboratory 1</td>
<td>2</td>
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<tr>
<td>CEEN 2610</td>
<td>Surveying</td>
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<tr>
<td>CEEN 2610L</td>
<td>Surveying Laboratory</td>
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<tr>
<td>MET 2616</td>
<td>Mechanics 2</td>
<td>3</td>
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<tr>
<td>CCET 2607</td>
<td>Civil 3D</td>
<td>3</td>
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<tr>
<td>CCET 2620</td>
<td>Transportation Technology</td>
<td>3</td>
</tr>
<tr>
<td>CCET 3706</td>
<td>Structural Design</td>
<td>4</td>
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<tr>
<td>CCET 3709</td>
<td>Structural Analysis 1</td>
<td>3</td>
</tr>
<tr>
<td>CCET 3711</td>
<td>Specifications and Estimating</td>
<td>3</td>
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</table>
### Bachelor of Science in Applied Science in Civil and Construction Engineering Technology

**CCET 3724**  
Hydraulics and Land Development  
3

### Design Elective (3 courses required):  
- **CCET 4812**  
Concrete Design  
- **CCET 4813**  
Steel Design  
- **CCET 4814**  
Foundation Design  
- **CCET 4815**  
Masonry Design  
- **CCET 4816**  
Timber Design  
- **CCET 3735**  
Heavy Highway Technology  
3
- **CCET 3740**  
Construction Management  
3
- **CCET 3708**  
Building Information Modeling  
3

### CCET Elective (2 courses required):  
- **CCET 4807**  
Project Planning & Scheduling  
- **CCET 4809**  
Structural Analysis 2  
- **CCET 4810**  
Construction Surveying  
- **CCET 4824**  
Environmental Technology  
- **CCET 4890**  
Special Topics in Civil and Construction Engineering Technology  
3

**ENTC 4895**  
Independent Engineering Technology Project  
2

**CCET 3714**  
Soil Mechanics  
2

**CCET 3714L**  
Soil Mechanics Laboratory (Technical Elective (1 course required):)  
1

### Technical Elective (1 courses required):  
- **MET 4870**  
Applied Finite Element Method  
- **CEEN 4835**  
Highway Design  
- **CEEN 5820**  
Pavement Material and Design  
- **CCET 4884**  
Civil/Structural Facilities Design  
3
- **EET 4810**  
Electrical System Design  
3

### Total Semester Hours  
135-137

### Year 1

**Fall**  
- **YSU 1500**  
Success Seminar  
1  
- **ENTC 1505**  
Engineering Technology Concepts  
4  
- **CCET 1503**  
CAD Technology  
2  
- **CCET 1504**  
Drafting and Plan Reading  
2  
- **MATH 1513**  
Algebra and Transcendental Function  
5  
- **ENGL 1550**  
Writing 1  
3  

**Spring**  
- **MET 1515**  
Mechanics 1  
3  
- **CCET 2604**  
Properties and Strength of Materials  
3  
- **CCET 2614L**  
Materials Laboratory 1  
2  
- **PHYS 1501**  
Fundamentals of Physics 1  
4  
- **ENGL 1550**  
Writing 2  
3  
- **Social Science GER**  
1  

**Total Semester Hours**  
17

### Year 2

**Fall**  
- **CEEN 2610**  
Surveying  
4  
- **MET 2616**  
Mechanics 2  
3  
- **CCET 3709**  
Structural Analysis 1  
3  
- **CCET 2620**  
Transportation Technology  
3  

### Year 3

**Fall**  
- **Design Elective**  
3  
- **CCET 3705**  
Computing for Technologists  
3  
- **MATH 2670**  
Applied Calculus 2  
5  
- **CHEM 1515**  
General Chemistry 1  
4  
- **CHEM 1515L**  
General Chemistry Laboratory 1  
0  
- **EET 3725**  
Electromechanical Systems  
4  

**Spring**  
- **Design Elective**  
3  
- **CCET 3735**  
Heavy Highway Technology  
3  
- **CCET 3740**  
Construction Management  
3  
- **CCET 3708**  
Building Information Modeling  
3  

**Total Semester Hours**  
15

### Year 4

**Fall**  
- **Design Elective**  
3  
- **CCET 3714 & 3714L**  
Soil Mechanics and Soil Mechanics Laboratory  
3  
- **CCET Elective**  
3  
- **Technical Elective**  
3  
- **Social & Personal Awareness GER**  
1  

**Total Semester Hours**  
15

**Spring**  
- **CCET 4884**  
Civil/Structural Facilities Design  
2  
- **EET 4810**  
Electrical System Design  
3  
- **Social & Personal Awareness GER**  
1  
- **Social Science GER**  
1  

**Total Semester Hours**  
15

**Total Semester Hours**  
135

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1. General Education Requirement: see “Schedule of Classes” for details.  
   SPA = Social & Personal Awareness (2 required for BSAS)  
   SS = Social Sciences (2 required for BSAS)  
   AH = Arts & Humanities (2 required for BSAS)  

2. Capstone course sequence must be taken concurrently, requires Program Coordinator approval.  

3. General Education Elective: Choose BIOL 2601 General Biology 1: Molecules and Cells, BIOL 2601L General Biology 1: Molecules and Cells Laboratory, GEOL 1505 Physical Geology, GEOL 1505L Physical Geology Laboratory, GEOL 2611 Geology for Engineers.
### Electives

<table>
<thead>
<tr>
<th>COURSE</th>
<th>TITLE</th>
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<tbody>
<tr>
<td><strong>Technical Electives</strong></td>
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<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
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<tr>
<td>Any CCET Electrical/Design Elective</td>
<td></td>
<td></td>
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<tr>
<td>MET 4860</td>
<td>Robotics Technology</td>
<td></td>
</tr>
<tr>
<td>CEEN 4835</td>
<td>Highway Design</td>
<td>4</td>
</tr>
<tr>
<td>CEEN 5820</td>
<td>Pavement Material and Design</td>
<td></td>
</tr>
</tbody>
</table>

| **Design Electives**                                      |                                              |      |
| Select three of the following:                           |                                              | 9    |
| CCET 4812   | Concrete Design                                         |      |
| CCET 4813   | Steel Design                                            |      |
| CCET 4814   | Foundation Design                                       |      |
| CCET 4815   | Masonry Design                                          |      |
| CCET 4816   | Timber Design                                           |      |

| **CCET Electives**                                       |                                              |      |
| Select two of the following:                            |                                              | 4-6  |
| CCET 4807   | Project Planning & Scheduling                           |      |
| CCET 4809   | Structural Analysis 2                                   |      |
| CCET 4810   | Construction Surveying                                  |      |
| CCET 4824   | Environmental Technology                               |      |
| CCET 4890   | Special Topics in Civil and Construction Engineering Technology | 4  |
| ENTC 4895   | Independent Engineering Technology Project             |      |

| Total Semester Hours | 16-18 |

4 Approval of the CCET Program Coordinator is required **before** taking the course.

### PROGRAM OUTCOMES

**BACHELOR OF SCIENCE IN APPLIED SCIENCE IN CIVIL AND CONSTRUCTION ENGINEERING TECHNOLOGY**

Graduates of the Bachelor’s Degree in Civil and Construction Engineering Technology will possess the following competencies upon graduation:

- **Learning Outcome 1**: ability to plan, prepare, and utilize design, construction, and operations documents, such as specifications, contacts, change orders, engineering drawings, and construction schedules
- **Learning Outcome 2**: perform economic analyses and cost estimates related to design, construction, operations, and maintenance of systems related to civil and construction engineering
- **Learning Outcome 3**: ability to select appropriate construction and engineering materials/practices
- **Learning Outcome 4**: (Construction Engineering Technology) ability to apply principles of construction law and ethics
- **Learning Outcome 5**: apply basic technical concepts related to the civil and construction engineering technology field; such as hydraulics, hydrology, geotechnics, structures, material behavior, transportation systems, and water and wastewater systems
- **Learning Outcome 6**: perform standard analysis/design in at least one technical specialty within civil and construction engineering technology