Construction Engineering Technology:

BS Continuous Improvement and Assessment Plan

Engineering & Science Technology Department: Mission Statement

The mission of the Engineering & Science Technology Department is to provide high quality career focused education that meets the specific needs of the region’s industrial, technical, and business community. Programs are structured to provide degree, certificate, and career enhancement opportunities for the recent high school graduate and the non traditional student returning for both degree and skill specific objectives.

Construction Engineering Technology: Mission Statement

The mission of the Construction Engineering Technology program is to provide opportunities for all students, regardless of age, educational, societal, or cultural background, to reach their educational goals in the area of construction engineering technology. The program shall provide comprehensive, quality technical education that prepares students for careers in construction engineering technology. The program shall provide employers and the public of northeastern Ohio with educated, technologically equipped graduates, able to serve the varied construction industries’ needs for solutions to problems facing the public and private sector.

Persons enrolled in the program may earn an AAS or a BS. Additionally, the program offers certificate programs in areas of economic demand to both degree and non-degree seeking students.

Construction Engineering Technology BS: Program Educational Objectives

To develop in students:

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.

Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field.

Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.

Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.
Review of PEOs
Stakeholders monitor the success of the program and provide continuous input. Formal meeting at least annually of Industry Advisory Council (AIC). AIC members are as follows:

a. Industry advisors/Employers  
b. Graduates  
c. Students  
d. Faculty

Charge of AIC:
To be responsive to the ever-changing technologies of the construction industries by considering modifications to the curriculum, as necessary, in order to offer the most current technologic education possible.

Suggestions for modifications to PEOs that require program changes are reviewed by Program Director for compliance with general education, OBR, TAC/ABET. If appropriate, then curriculum is modified through University procedures.

Other changes not requiring formal curriculum changes are considered by faculty and program leaders for incorporation into the program PEOs. Modifications are then made and aligned with student outcomes and then assessed as determined by the assessment cycle in this plan.
PAGE LEFT BLANK

SEE NEXT PAGE
### BS CONSTRUCTION ENGINEERING TECHNOLOGY

#### PROGRAM OBJECTIVES TO STUDENT LEARNING OUTCOMES MAPPING

<table>
<thead>
<tr>
<th>Learning Outcomes (Students)</th>
<th>Course Map &amp; Performance Indicators</th>
<th>Program Education Objectives (Graduate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.</td>
<td><strong>2990:234 Elements of Structures (3rd in Series of Courses) (Fundamental Design Using Steel Design Code)</strong>&lt;br&gt;Performance Indicator:&lt;br&gt;• Applying the building and design codes for fundamentals of design.&lt;br&gt;&lt;br&gt;<strong>2990:354 Foundation Construction Methods</strong>&lt;br&gt;Performance Indicators:&lt;br&gt;• Concepts of Design&lt;br&gt;• Technical Report Preparation&lt;br&gt;• Computational Analysis and Design Methods&lt;br&gt;&lt;br&gt;<strong>2990:358 Advanced Estimating</strong>&lt;br&gt;Performance Indicators:&lt;br&gt;• Identifying Scope of Work and Prepare Estimate</td>
<td>Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.&lt;br&gt;&lt;br&gt;Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.</td>
</tr>
</tbody>
</table>
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.

<table>
<thead>
<tr>
<th>Course</th>
<th>Performance Indicators</th>
<th>Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.</th>
<th>Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.</th>
</tr>
</thead>
</table>
| 2990:234 Elements of Structures (3rd in Series of Courses) (Fundamental Design Using Steel Design Code) | Performance Indicator:  
  - Fundamental design computations.                                          |                                                                                                                                 |                                                                                                                                 |
| 2990:371 Green & Sustainable Bldg. Practices | Performance Indicators:  
  - Sustainability Case Study, Materials Selection and Technical Report & Presentation Development |                                                                                                                                 |                                                                                                                                 |
| 2990:352 Field Management and Scheduling | Performance Indicators:  
  - Students will develop a graphical representation of a project schedule.  
  - Student will prepare a project schedule planning report. |                                                                                                                                 |                                                                                                                                 |
3. an ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Performance Indicators</th>
</tr>
</thead>
</table>
| 2990:237    | Materials Testing II (Concrete) | ACI Field Testing Techniques for Concrete
- ASTM test procedures, equipment usage, data collection and technical reporting. |
| 2990:129    | Computer Apps in Construction (Presentation Project) | Performance Indicators:
- Presentation & Evaluation by Peers |
| 2990:468    | Construction Management (Capstone) | Performance Indicators:
- Students will prepare construction project proposals and related documents.
- Students will prepare a team project
- Students will present as a team |
| 2990:371    | Green & Sustainable Bldg. Practices | Performance Indicators:
- Quality of Technical Report & Presentation
- Timeliness of Presentation |

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.

4. an ability to communicate effectively with a range of audiences.

| Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field. |
| Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public. |

Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.
5. an ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

2990:371 Green & Sustainable Bldg. Practices
Performance Indicators:
- Understanding of LEED Scoring System For Project Improvement.

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.

Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.

6. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

2990:237 Materials Testing II, Concrete (ACI Field Testing Techniques for Concrete)
Performance Indicator:
- Materials testing procedures as part of team

2990:468 Construction Management (Capstone)
Performance Indicators:
- Students will prepare construction project proposals and related documents.
- Students will prepare a team project
- Students will present as a team to industry panel

Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.

Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.

Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.
<table>
<thead>
<tr>
<th>CMAA Student Chapter Activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Employer Symposium</td>
</tr>
<tr>
<td>• Alternative Spring Break Trip</td>
</tr>
<tr>
<td>• Meetings and guest speakers</td>
</tr>
<tr>
<td>Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.</td>
</tr>
</tbody>
</table>

---

**BS CET Program Specific Student Learning Outcomes**

**Objective #2:** The technical skills needed for successful employment as a leader/manager in the construction engineering technology field.

**Objective #3:** An appropriate level of broad-based technical expertise related to construction administration and project management.

<table>
<thead>
<tr>
<th>a. utilization of techniques that are appropriate to administer and evaluate construction contracts, documents, and codes;</th>
<th>2990:469 Construction Specifications &amp; Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Indicators:</td>
<td>• Identify contract related time delays.</td>
</tr>
<tr>
<td></td>
<td>• Identify ethical and professional leadership criteria that can impact project outcome.</td>
</tr>
<tr>
<td></td>
<td>Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. estimation of costs, estimation of quantities, and evaluation of materials for construction projects;</th>
<th>2990: 358 Advanced Estimating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Indicators:</td>
<td>• Quantity Estimating</td>
</tr>
<tr>
<td></td>
<td>Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field.</td>
</tr>
<tr>
<td></td>
<td>Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c. utilization of measuring methods, hardware, and software that are appropriate for field, laboratory, and office processes related to construction;</th>
<th>2990:237 Materials Testing II, Concrete (ACI Field Testing Techniques for Concrete)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Indicator:</td>
<td>• ASTM test procedures, equipment usage, data collection and technical reporting.</td>
</tr>
<tr>
<td></td>
<td>Objective #2: An appropriate level of specialized technical expertise to perform construction materials testing for quality control.</td>
</tr>
</tbody>
</table>
|   | 2990:354 Foundation Construction Methods | Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.  
Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field. |
|---|---|---|
| **d.** | **2990:354 Foundation Construction Methods**  
Performance Indicators:  
- Concepts of Design  
- Technical Report Preparation  
- Computational Analysis and Design Methods |  

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.  
Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field. |
| **e.** | **2990:354 Foundation Construction Methods**  
Performance Indicators:  
- Drawings & Diagram Development |  

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.  
Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field. |
| **f.** | **2990: 358 Advanced Estimating**  
Performance Indicators:  
- Cost Estimating Using Technical References  
- Computational Methods For Estimating |  

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.  
Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field. |
| **g.** | **2990:371 Green & Sustainable Bldg. Practices**  
Performance Indicators:  
- Select Materials and Practices of LEED Certification |  

Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.  
Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field.  
Objective #3: An appropriate level of broad-based technical expertise related to construction administration and project management. |
h. applying appropriate principles of construction management, law, and ethics.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Performance Indicators</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2990:469</td>
<td>Construction Specifications &amp; Contracts</td>
<td>• Apply principles of construction management to evaluate final project outcome of a renovation project with various contract difficulties.</td>
<td>Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.</td>
</tr>
</tbody>
</table>

Objective #4: The knowledge and dexterity to perform effectively in the workplace with the communication skills needed to deal with fellow workers, clients and the public.

i. performing standard analysis and design in at least one sub-discipline related to construction engineering.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Performance Indicators</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2990:354</td>
<td>Foundation Construction Methods</td>
<td>• Concepts of Pile Cap Design</td>
<td>Objective #1: A sound understanding of the concepts of construction engineering, including fundamentals of design and project management.</td>
</tr>
</tbody>
</table>

Objective #2: The technical skills needed for successful employment as a leader/manager in the construction engineering technology field.
The following personnel and tools are used for the continuous assessment and improvement of the CET Program:

1. A CET Industrial Advisory Committee comprised of the following stakeholders in the CET Program: local professionals involved in the CET field, all full-time CET faculty, one part-time CET faculty member, one CET graduate, one current CET student. At least 1/3 of the Committee membership will be changed every third year.

2. The CET Industrial Advisory Committee communicates (via meetings, e-mail, phone or mail) at least once per semester and meets personally at least once per year. The primary responsibility of this committee is to set the Program Educational Objectives and to provide advice on current trends, equipment, and methods. Written minutes of all meetings are produced.

3. The content of the Program Educational Objectives and the Student Outcomes are reviewed for modification at least every third year by the IAC.

4. CET faculty members assess student performance and report the results as follows:

   b. Results of course assessments are accumulated, organized AND evaluated for continuous improvement by the faculty.
   c. Identified program weaknesses are discussed among CET faculty and the IAC, and reported in the minutes along with potential steps for resolution.
   d. The identified courses for assessment (see above) will be evaluated at least once per three year cycle.