



# Pathways to Green Economy Occupations in Engineering and Construction

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## Abstract

The Department of Construction Management and Civil Engineering technology is working to expose and prepare our students to enter “focus occupations,” identified by NYC as critical to the sustainable growth of the Green economy. We offer three degrees in construction management, civil engineering technology and construction engineering technology. The Department was recently awarded a 2025 ASEE Engineering for One Planet (EOP) mini grant to support curriculum development efforts to incorporate sustainability focused learning outcomes in alignment with this initiative. The project team will use the EOP framework to develop one new course targeting advanced learning outcomes and modify four existing courses targeting core learning outcomes. The topic areas we will focus on include environmental literacy, social responsibility, environmental impact assessment, materials selection, and design. These changes will be implemented in the curriculum and become a permanent part of the program. The EOP framework will be integrated in our ABET self-study therefore we will continuously refer to the topics in the framework and stay current with ASEE updates. The proposed project will impact all the students in our program by understanding the significance of sustainability, the history and the future with respect to engineering. Our graduates will be better prepared for industry demands and more importantly prepared to make the decisions in their professional practice that impact society’s future. This poster will highlight the outcomes of the mini grant and discuss the plans for Implementation of EOP in core engineering classes as well as methods for expansion through industry collaborations.

## Background

New York City has one of the most vibrant ecosystems for new startup fields and a fast-growing environment for creating jobs. Therefore, an up-to-date infrastructure and built-environment in this ultra urban city is vital to maintain its vibrancy. Built-environment majors are typically used to describe the interdisciplinary field that addresses the design, construction, management, and use of these man-made surroundings as an interrelated whole as well as their relationship to human activities over time.

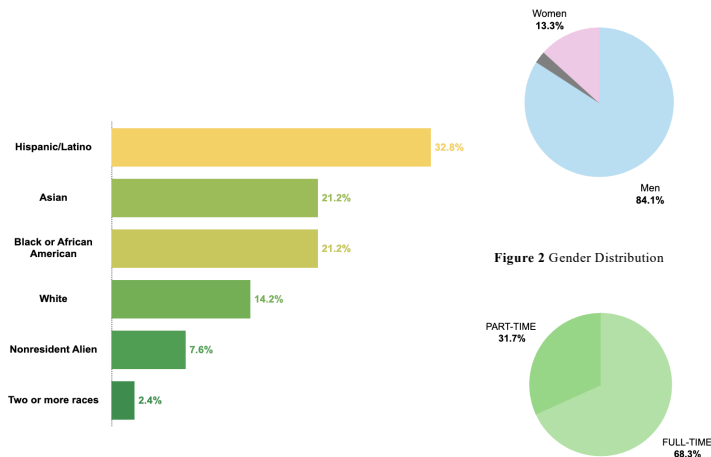


Figure 1 Enrollment by Ethnicity in the CMCE Department

Figure 2 Gender Distribution

Figure 3 Enrollment Status

## EOP Learning Outcomes



## Modified Courses

### First Year Courses

- CMCE 1115 - Statics
- CMCE 1224 - Methods and Materials of Construction II

### Second Year Course

- CMCE 2457 - Construction Techniques in Civil Engineering

### Third Year Course

- CMCE 2351 - Fluid Mechanics

### Fourth Year Course

- CMCE 4461 - Instrumentation and Condition Assessments

## Impact

The proposed project will impact all the students in our program by understanding the significance of sustainability in engineering and construction practices. Our graduates will be better prepared for industry demands and more importantly prepared professional practice that impact society’s future. We will impact approximately 400 students per year from our major.

## Course Modification Highlights

<b>CMCE 1115</b> Statics	<ul style="list-style-type: none"> <li>EOP Learning Outcome: Social Responsibility</li> <li>New Activity : Bridge Design considering ethical consideration for communities/societies, and environmental justice.</li> </ul>
<b>CMCE 1224</b> Methods and Materials of Construction II	<ul style="list-style-type: none"> <li>EOP Learning Outcome: Environmental Impact Assessment</li> <li>New Activity: Analyzing the Environmental Impact of a product and life cycle assessment.</li> </ul>
<b>CMCE 2457</b> Construction Techniques in Civil Engineering	<ul style="list-style-type: none"> <li>EOP Learning Outcome: Environmental Impact Statement</li> <li>New Activity: Analyzing the Environmental Impact of a product and life cycle assessment.</li> </ul>
<b>CMCE 2351</b> Fluid Mechanics	<ul style="list-style-type: none"> <li>EOP Learning Outcome: Environmental Literacy, Materials selection, Design, Communication &amp; Teamwork</li> <li>Revised Lecture and Laboratory: Forces due to Fluids in Motion and Impact of a Jet and hydropower Applications</li> </ul>
<b>CMCE 4461</b> Instrumentation and Condition Assessments	<ul style="list-style-type: none"> <li>EOP Learning Outcomes: Environmental Literacy, Material Selection, and Design</li> <li>Title Change: Instrumentation and Green Roof Systems for Resilient Infrastructure</li> <li>New Lectures: Green Roof Components, System Design, Construction, Vegetation and Maintenance.</li> <li>New Laboratories: Green Roof Installation, and Instrumentation Monitoring.</li> </ul>

## Future Work

These course changes will be implemented in the curriculum and become a permanent part of the program. As we perform future cycles of continuous assessment for ABET, we will incorporate the EOP framework and stay current with industry standards. The project team plans to solicit additional funding for a complete curriculum review for integration across all courses.

## References

- The Lemelson Foundation (2022). The Engineering for One Planet Framework: Essential Sustainability-focused Learning Outcomes for Engineering Education (2022). Retrieved [August 1, 2025]
- Engineering for One Planet Framework: 13 Step-by-Step Ideas for Integrating Sustainability into Core Engineering Courses (2023). Retrieved [November 1, 2025]

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