CE 485 - 103 ST: CE Leadership of Project Execution

Lectures: Tuesday 6:00pm - 8:50pm
Faculty Memorial Hall (FMH), Room 108

Instructor:
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(973) 596-3665
Office Hours: Tues. 4:00 - 6:00pm
Or by appointment (In-person or Zoom)

Prerequisite No Prerequisites

Course Description:

Focusing on the civil engineering student design teams including the Steel Bridge Team, Concrete Canoe, 3D Printed Bridge, and Surveying Team, this course equips students with leadership skills, project management expertise, and the technical knowledge necessary to excel in regional and national competitions. This includes looking at the specific ASTM information pertinent to each project as well as official competition documentation provided by ASCE and AISC. Students will explore key topics such as team coordination, scheduling, budgeting, risk management, and technical skills specific to each design challenge. Throughout the course, participants will gain insight into each project's requirements and learn strategies to successfully execute and deliver designs adhering to each competition's rules and constraints, skills that can be translated to real-world projects. The course provides valuable preparation for those looking to improve their design skills or seeking to lead multidisciplinary teams and make valuable contributions to the various design teams.

This course is open to all students in the civil engineering program who seek an understanding of the teams, general project management and execution knowledge, and leadership skills

Grading Policy

Participation: 5%
Assignments/Homework: 40%
Mid-Project Deliverable: 20%
Final Project Proposal: 20%
Project Proposal Presentation: 15%

Feedback:

Students will receive feedback on all classwork/homework assignments by the week following their submission. They will receive feedback via the comments on canvas

Assessment Categories and Descriptions:

Participation – 5%

-Active involvement in class discussions, activities, and assignments.
-Consistent attendance and engagement during lectures and group activities.
-Contributing constructively to group dynamics and supporting classmates.

Assignments/Homework – 40%

-Weekly or biweekly assignments aligned with class topics (e.g., goals/constraints lists, work breakdown structures, risk assessments).
-Each assignment builds toward components of the final project proposal.
-Graded on completeness, accuracy, effort, and application of project management concepts

Late submissions may be penalized unless prior arrangements are made.
Mid-Project Deliverable – 20%

-A draft proposal or partial submission demonstrating significant progress toward the final project.
-Should include Goal, Constraints, Research, Project Breakdown Structure, Project Schedule, Team Breakdown Structure, and Budget
-Evaluated on clarity, organization, technical soundness, use of feedback, and progress toward final deliverable.
Final Project Proposal – 20%

-Comprehensive written proposal that integrates all project components. It should fully and clearly exemplify what exactly the project entails and the plan to execute it successfully Graded on technical accuracy, depth of analysis, organization, formatting, use of feedback, and professionalism.
-Must demonstrate readiness for project execution as if submitted to a competition or sponsor.

Exam Information and Policies

Your Mid-Project Deliverable will act as the mid-term
The Final Project Proposal will act as your final

Policy for Late Work:

Late work will be accepted for up to 1 week without a penalty. Anything submitted beyond a week past the due date will need to be communicated to the professor before the end of the 1-week grace period and is subject to a 10% late fee.

AI statement:

The use of artificial intelligence (AI) is permitted in this course only when explicitly stated in assignments. If students use AI for any course-related work, they must cite it according to the guidelines provided on the **NJIT Library AI Citation page**. If you have any questions about AI use in this course, please contact the course instructor before submitting any assignments. In cases where AI use is not allowed, students are expected to complete work without AI assistance to develop their skills in this subject area.\

Academic Integrity Statement:

"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy."

Class Etiquette Expectations:

Students are expected to arrive on time prepared, to participate in class and respectfully engage, communicate in a courteous manner, and collaborate effectively. Students are also expected to follow the guidelines set forth by NJIT's Code of Student Conduct.

Weekly Expectations

Each week students will attend class once a week and participate in class. They will complete the class work and necessary assignments assigned in between class sessions.

Course Schedule	
Week/Topic	**Assignments**
Week 1 (9/2/25)	No Assignment Due
Introduction to Design Teams	
Introduction to Project Management	
Week 2 (9/9/25)	No Assignment Due
Identifying Goals and Constraints	
Project Research	
Week 3 (9/16/25)	Goals and Constraint List and project research due
Project and Work Breakdown Structures	
Scheduling and time Management	

Week 4 (9/23/25) Team structure and Organization and Contracts Budgeting and Funding	Project/Work Breakdown Structure Due and a Working Schedule Due
Week 5 (9/30/25) Identifying potential Risks and Risk Mitigation Decision Making and Problem Solving	Team Breakdown Structure and Budget Due
Week 6 (10/7/25) Team Monitoring and accountability Project Tracking Technical Aspects of the projects	Risk Report and Mitigation Plan Due
Week 7 (10/14/25) Mid Project Deliverable Review	No Assignment Due
Week 8 (10/21/25) Health and Safety during execution Lab Resources and "Shop Time"/Department Resources	Mid Project Deliverable Due
Week 9 (10/28/25) Software overviews	Lab use and Safety Plan due
Week 10 (11/4/25) Project Execution	No Assignment Due
Week 11 (11/11/25) Quality Control and Assurance Testing and Practice	Project Methodology and Approach/Execution Due
Week 12 (11/18/25) Project Proposal Overview and Integration Project proposal Presentation overview	Team Practice Outline and Quality Control / Testing Plan Due
Week 13 (12/2/25) Final review of the course Questions on final project proposal or Presentations	No Assignment Due

Week 14 (12/9/25)	Final Project Proposal Due
Project Proposal Presentations	

Course Objective Matrix - CE 485

Strategies and Actions	Course Student Learning Outcomes	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Methods/Metrics
Course Objective 1: The objective of this course is to equip students with the knowledge, skills, and hands-on strategies necessary to successfully plan, manage, and execute multidisciplinary civil engineering design team projects.				
Identify project constraints and define project goals for a design team competition.	1,2,7	1,2,6,7	1,2	Periodic assessment and homework
Collaborate within multidisciplinary teams to complete mock execution activities (fabrication planning, casting trials, surveying field work).	3,5,6	1,2,3,5	1,2	Group Activities and Assignments
Create a final project portfolio and presentation synthesizing all planning, execution, and reflection elements.	2,3,6,7	1,2,4	1,2	Final Project Proposal and Presentation

CEE Mission, Program Objectives and Student Outcomes

The mission of the Department of Civil and Environmental Engineering is:

- to educate a diverse student body to be employed in the engineering profession
- to encourage research and scholarships among our faculty and students
- to promote service to the engineering profession and society

Program Educational Objectives

Our **Program Educational Objectives** are reflected in the achievements of our recent alumni:

1. **Engineering Practice:** Alumni will successfully engage in the ethical practice of civil engineering within industry, government, and private practice, working towards safe, practical, resilient and sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.
2. **Professional Growth:** Alumni will advance their technical and interpersonal skills through professional growth and development activities such as graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as academia, business, and law through further education.
3. **Service:** Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Student Outcomes

Our **Student Outcomes** are what students are expected to know and be able to do by the time of their graduation:

1. an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusion
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

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