

Spring 2020

CE 495-004: Civil Engineering Design II (Transportation)

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JOHN A. REIF, JR. DEPARTMENT OF
**CIVIL AND ENVIRONMENTAL
ENGINEERING**



CE 495-Civil Engineering Design II (Transportation) Section: 004

Spring 2020

Text: Handout materials only

Instructor: Joseph Baladi, P.E, P.P, CME, CPWM, Email: joseph.baladi@njit.edu

Monday 8:30 AM – 11:20 AM , Central King Building Room 314 Jan 21, 2019 - May 14, 2020

Prerequisites: [CE 333](#), [CE 432](#), [CE 443](#) and [CE 494](#). Provides students with the type of design experience they would receive if engaged in civil and environmental engineering design practice. Course will focus on one or more of these design areas: structural, geotechnical, transportation and planning, and sanitary and environmental engineering.

“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 that is found at:

<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

***Outlines:**

Class 1: Introduction and overview to Projects

Class 2: Project and group selection, handout related to projects

Class 3: Project support materials review – Problem Statement

Class 4: Capital project process, stakeholders, public meeting, funding sources

Class 5: Site Visit

Class 6: Design criteria

Class 7: Highway capacity & level of service analysis

Class 8: Project management and coordination with entities involved in project (private, local, state and federal)

Class 9: Work with individual group, technical guidance

Class 10: Evaluate design alternatives, lanes arrangement, layout, cross section, profiles

Class 11: Additional Specific Design Criteria related to groups. Traffic analysis and data.

Class 12: Group sessions and guidance regarding preferred alternative design

Class 13: Meeting with actual stakeholders and project managers (date may vary)

Class 14: Group session to integrate preferred design with existing infrastructures such as adjacent existing abutments, geometric constraints and existing roadway profiles and layout - CAD and progress and initial submittal. Review and comment on progress set

Class 15: Final submittal and Presentations - Closing remarks and comments. Appendix / supporting materials submittals deadline.

Grading: Grading will be judged based on completeness, accuracy, final term project presentation, report, and design drawings.

Outcomes Course Matrix – CE 495 Civil Engineering Design II

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Analyze, evaluate and design a civil or environmental engineering project (building foundation, treatment facility, etc.)			
Present an area specific civil and environmental engineering practice design problem.	1, 2, 7	1, 2	Final project report and periodic progress reports.
Discuss specific code, performance, cost, time, quality and safety objectives.	2, 4	1, 2	Final project report and periodic progress reports.
Work individually and within multi-disciplinary design teams.	3, 5	1, 2	Final project report, periodic progress reports, oral presentation.

CEE Mission, Program Educational 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 scholarship among our faculty and students
- to promote service to the engineering profession and society

Our program educational objectives are reflected in the achievements of our recent alumni:

1 – Engineering Practice: Alumni will successfully engage in the practice of civil engineering within industry, government, and private practice, working toward 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 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 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 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 and inclusive 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 conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

***Notes:**

- This class will provide seniors with the type of design experience they would receive if are engaged in Civil and Transportation engineering design practice. The main design topic is Transportation design but there will be limited interaction and consistency with other design criteria and design disciplines.
- Students will gather project data of real life ongoing capital project in New Jersey, visit the site, attend one public session for stake holders or general information session, review relevant project reports, get familiar with all steps needed in the process to prepare alternatives, choose preferred alternative, preliminary engineering and final design.
- The sequence of the outlines may vary based on each individual group approach and class progress. Students will be notified by the instructor to any modifications or deviations from the syllabus throughout the semester.
- Site visit date and timing is subject to weather, students will be notified accordingly.
- Individuals in the same group may receive different grades based on attendance, individual work, class participation and presentation.