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

NJIT New Jersey Institute of Technology

CE 494 - Section 104 - Civil Engineering Design I - Spring 2018

Saturday 9:00 AM - Colton Hall 416

Texts: No Textbook. Handout Materials Only.

Instructor: Joseph Baladi, P.E, P.P, CME, CPWM.

Contact information: joseph.baladi@njit.edu

Prerequisite: *Senior standing in civil engineering. Simulates the submission and acceptance process normally associated with the initial design phases for a civil engineering project. Familiarizes students with the preparation of sketch plats, preliminary engineering design, and a related environmental assessment. Requirements include written submittals and oral presentations in defense of the project.*

Date	Topic
Week 1	First class meeting, formation of teams & project overview. Lecture - Introduction to Land Development, Cad Data Management, Boundary Surveys and Topographic Maps. Project Management.
Week 2	Lecture - Subdivisions, Matching Existing Grade (Designing Parcels and Roadways to Minimize Grading), Editing CAD designs. NJDOT Design Standards. Handout.
Week 3	Subdivision boundary analysis and area computations may be submitted for informal review. Lecture Roadway Design: Alignments, Profiles and Cross Sections.
Week 4	Submittal deadline for Phase I Conceptual Subdivision Plan. Lecture - Roadway Design: Cul-de-sac and Intersection Design. Roadway Widening. RFP.
Week 5	Lecture - Soil Maps, Stormwater Management: Detention Basins and Water Quality Devices. FEMA MAPS & Procedures.
Week 6	Review of Conceptual Plans with each team. Lecture – Stormwater Management: Drainage Area Maps, Sizing Detention Basins and Storm Sewers. Review Check list
Week 7	Review of Conceptual Plans with each team. Lecture –. Sanitary and Domestic Water Services. Incorporate Signal Layout and Handout.
Week 8	Lecture – Handout: Site Grading. GIS Incorporation.
Week 9	Discussion on Environmental Impact Report and Wetland analysis. Lecture - Planning Board Report Requirements, Soil Erosion and Sediment Control Plans
Week 10	Planning Board Reports Due. Lecture - Residential Grading: Driveways Profiles, Cost Estimate, Management and I
Week 11	Lecture- Permits. Agencies Coordination. Project Award & Inspection.
Week 12	Lecture - Lecture-Public Speaking, Oral Presentation Requirements. Subdivision Plan sets, Sheet indexes and plan creation.
Week 13	Project Presentations.
Week 14	Deadline for Submission of Phase II Materials - Project Presentations.
Week 15	Final

Grading (200 total points

Point Total	Grade
180 +	A
171-179	B +
160-170	B
151-159	C +
130-150	C
120-129	D
Below 120	F

*The NJIT Honor Code will be upheld and any violations will be brought to the immediate attention of the Dean of Students.

* Planning Board Report is required. Site visit is optional and will be coordinated per class time.
*Students will be consulted with by the instructor and must agree to any modifications or deviations from the syllabus throughout the course of the semester.

CE 494 – Civil Engineering Design I

Description:
Simulates the submission and acceptance process normally associated with the initial design phases for a civil engineering project. Familiarizes students with the preparation of sketch plats, preliminary engineering design, and a related environmental assessment. Requirements include written reports and oral presentations in defense of the project.

Prerequisites: Senior standing in Civil Engineering

Textbook(s)/Materials Required:
No new textbooks. Students are expected to utilize the textbooks from preparatory courses as well as other related references.

Course Objectives:
Simulate the submission and acceptance process normally associated with the initial design phases for a civil engineering project to familiarize students with the preparation of sketch plats, preliminary engineering design, and a related environmental assessment.

Topics:
Depends on Site Selected. Typically the following topics are covered:
Introduction to project site, zoning requirement and other constraints
Check Boundary and Area
Street Design
Lot Design
Grading Plans
Environmental Impact Analyses and Report
Sanitary Sewer Design
Stormwater Collection Design
Stormwater Management Design
Soil Program and Sediment Control
Potable Water Analysis
Quantities and Cost Estimate

Schedule: Lecture/Recitation- 3 hour class, once per week
Laboratory- non engineering Topics (Design)

Program Objectives Addressed: 1, 2

Prepared By: John Mayo, PE

Outcomes Course Matrix – CE 494 - Section 104 - Civil Engineering Design I - Spring 2018

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Simulate the submission and acceptance process normally associated with the initial design phases for a civil engineering project. Prepare sketch plats, preliminary engineering design, and a related environmental assessment.			
Present an open ended civil engineering practice design problem for solution by teams of students.	1, 2, 3, 4, 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.	5	1, 2	Final project report, periodic progress reports, oral presentation of project.

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.

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 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