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

Week 5

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

Week 8
Lecture – Handout: Site Grading. GIS Incorporation.

Week 9

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)**

<table>
<thead>
<tr>
<th>Point Total</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>180 +</td>
<td>A</td>
</tr>
<tr>
<td>171-179</td>
<td>B +</td>
</tr>
<tr>
<td>160-170</td>
<td>B</td>
</tr>
<tr>
<td>151-159</td>
<td>C +</td>
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<tr>
<td>130-150</td>
<td>C</td>
</tr>
<tr>
<td>120-129</td>
<td>D</td>
</tr>
<tr>
<td>Below 120</td>
<td>F</td>
</tr>
</tbody>
</table>

*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
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.

<table>
<thead>
<tr>
<th>Strategies, Actions and Assignments</th>
<th>ABET Student Outcomes (1-7)</th>
<th>Program Educational Objectives</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present an open ended civil engineering practice design problem for solution by teams of students.</td>
<td>1, 2, 3, 4, 7</td>
<td>1, 2</td>
<td>Final project report and periodic progress reports.</td>
</tr>
<tr>
<td>Discuss specific code, performance, cost, time, quality and safety objectives.</td>
<td>2, 4</td>
<td>1, 2</td>
<td>Final project report and periodic progress reports.</td>
</tr>
<tr>
<td>Work individually and within multi-disciplinary design teams.</td>
<td>5</td>
<td>1, 2</td>
<td>Final project report, periodic progress reports, oral presentation of project.</td>
</tr>
</tbody>
</table>

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

Revised: 2/13/18