Course Description:

Course 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 submittals and oral presentations in defense of the project.

Prerequisite – Senior standing in Civil Engineering

Moodle:

Students must use their UCID to sign in at (http://www.moodle.njit.edu). Some course material may be posted on Moodle. The instructor will advise when important information is uploaded.

Instructor: Diogo F. Santos PE, PP

Email: ds8@njit.edu

Recommended Text:

2.) Introduction to Hydraulics and Hydrology with Applications for Stormwater Management, John E. Gribbin, 3rd edition

Course Sections:

Section 103 –Tuesdays @ 6:00 PM – 9:05 PM (KUPF 202)

Items Required for this Course:

1. Engineering Scale
2. Flash drive
3. Notebook
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>Topic/Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9/5</td>
<td>Meet and Greet, Introduction to Project Requirements, Review Land Use Code</td>
</tr>
<tr>
<td>2</td>
<td>9/12</td>
<td>Zoning Constraints, RSIS, AASHTO Requirements, NJDEP Wetland Regulations</td>
</tr>
<tr>
<td>3</td>
<td>9/19</td>
<td>Roadway Design – Centerline Stationing, Horizontal &amp; Vertical Curve Design, Stopping Sight Distance</td>
</tr>
<tr>
<td>4</td>
<td>9/26</td>
<td>Grading Design – Existing and Proposed Contours, Spot Elevations</td>
</tr>
<tr>
<td>5</td>
<td>10/3</td>
<td>Continuation of Site Grading &amp; Roadway Design</td>
</tr>
<tr>
<td>6</td>
<td>10/10</td>
<td>Storm Sewer Design – Pipe Materials, Drainage Structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>LAYOUT PLAN DUE</strong></td>
</tr>
<tr>
<td>7</td>
<td>10/17</td>
<td>Storm Sewer Design – Rational Method/Mannings Equation</td>
</tr>
<tr>
<td>8</td>
<td>10/24</td>
<td>Stormwater Quantity Design – TR-55 Method</td>
</tr>
<tr>
<td>9,10</td>
<td>10/31</td>
<td>Stormwater Quantity Design – Detention Basin, Outlet Structures</td>
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<tr>
<td></td>
<td>11/7</td>
<td>Hydraflow Modeling</td>
</tr>
<tr>
<td>11</td>
<td>11/14</td>
<td>NJDEP Stormwater Quality Design/Groundwater Recharge Requirements</td>
</tr>
<tr>
<td>13</td>
<td>11/28</td>
<td>Water &amp; Sewer Design</td>
</tr>
<tr>
<td>14</td>
<td>12/5</td>
<td>Mock Presentations/Final Project Review</td>
</tr>
<tr>
<td>15</td>
<td>12/12</td>
<td><strong>FINAL PROJECTS DUE/TEAM PRESENTATION</strong></td>
</tr>
</tbody>
</table>
GENERAL COURSE INFORMATION

Grading Policy:

GRADING (Total Points = 300):

Plans – 200 pts

- Title Sheet 10 pts
- Layout Sheet 60 pts
- Grading & Stormwater 100 pts
- Utilities 15 pts
- Profile or Detail Sheet 15 pts

Report – 75 pts

- Code Review 5 pts
- Site Layout & Wetlands 5 pts
- Site Grading 5 pts
- Stormwater Management 10 pts
- Utility Design 5 pts
- Existing Drainage Area Map 5 pts
- Proposed Drainage Area Map 5 pts
- Pipe Sizing Drainage Area Map 5 pts
- Pipe Sizing Calculations 15 pts
- Hydraflow Output 15 pts

Presentation – 25 pts

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% to 100%</td>
</tr>
<tr>
<td>B+</td>
<td>85% to 89%</td>
</tr>
<tr>
<td>B</td>
<td>80% to 84%</td>
</tr>
<tr>
<td>C+</td>
<td>75% to 79%</td>
</tr>
<tr>
<td>C</td>
<td>70% to 74%</td>
</tr>
<tr>
<td>D</td>
<td>65% to 69%</td>
</tr>
<tr>
<td>F</td>
<td>64% or lower</td>
</tr>
</tbody>
</table>

Attendance Policy:

Students are expected to attend every class and sign in. In the event that you cannot attend class, you may request to attend one of the other sections as a make-up, however this is limited to availability and permission from the instructor. Students are responsible for submitting all homework, projects, assignments, etc. on the due date (during class time). Students who miss assignments due to attendance must contact the Dean of Students to be excused for absences. Students who miss class with no valid excuse (as determined by the Dean of Students) will not be given any accommodations to complete work.

Withdrawals:

In order to insure consistency and fairness in application of the NJIT policy on withdrawals, student requests for withdrawals after the deadline will not be permitted unless extenuating circumstances (e.g., major family emergency or substantial medical difficulty) are documented. The course Professors and the Dean of Students are the principal points of contact for students considering withdrawals.
NJIT Honor Code:

The NJIT Honor Code will be upheld; any violations will be brought to the immediate attention of the Dean of Students. The Honor Code can be found at [http://www5.njit.edu/doss/policies/honorcode/index.php](http://www5.njit.edu/doss/policies/honorcode/index.php).

Assignment Policy:

Late assignments will NOT be accepted. Homework received after the due date will NOT be graded and a ZERO will be counted for that assignment.

***ANY ASSIGNMENT THAT IS COPIED WILL RECEIVE A ZERO AND THOSE STUDENTS INVOLVED WILL BE SUBJECT TO DISCIPLINARY ACTION IN ACCORDANCE WITH THE NJIT HONOR CODE***

All assignments are to be submitted in class on paper, unless otherwise requested, on the due date, or via email to ds8@njit.edu ON OR BEFORE the beginning of class on the due date. Email is only to be used if you will be absent from class and shall not be the primary form of submission.

Syllabus Information:

The dates and topics of the syllabus are subject to change; however, students will be consulted with and must agree to any modifications or deviations from the syllabus throughout the course of the semester.

Email Policy:

When emailing the instructor, you must provide your course and section number in the subject line. Also, although most email addresses will display your name, you must sign off with your full name at the bottom of each email. If you do not provide these two critical piece of information, your email will not be responded to.

Dress Policy:

Students are required to dress professionally for all oral presentations.
### Course Objectives Matrix – CE 494 Design 1

<table>
<thead>
<tr>
<th>Strategies and Actions</th>
<th>Student Learning Objectives</th>
<th>Student Outcomes (a-k)</th>
<th>Prog. Educational Object.</th>
<th>Assessment Methods/Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present an open ended civil engineering practice design problem for solution by teams of students</td>
<td>Learn how to identify, formulate, and solve open ended civil engineering practice design problems by applying knowledge of mathematics, science, and engineering integrated with CAD.</td>
<td>a, c, d, e, k</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>Learn how to identify, formulate and solve area specific civil and environmental engineering practice problems that meet specified code, performance, cost, time, quality and safety objectives.</td>
<td>c, d, e, f, h, i, j</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>Learn how to function and communicate effectively both individually and within multi-disciplinary design teams.</td>
<td>d, g</td>
<td>1,2</td>
<td>Final project report, periodic progress reports, oral presentation of project</td>
</tr>
</tbody>
</table>

### 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 scholarship among our faculty and students
- to promote service to the engineering profession and society

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

1 – **Engineering Practice:** Recent 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:** Recent alumni will advance their skills through professional growth and
development activities such as graduate study in engineering, professional registration, and continuing
education; some graduates will transition into other professional fields such as business and law
through further education.

3 – Service: Recent alumni will perform service to society and the engineering profession through
membership and participation in professional societies, government, educational institutions, civic
organizations, and humanitarian endeavors.

Our student outcomes are what students are expected to know and be able to do by the time of
their graduation:

(a) an ability to apply knowledge of math, science, and engineering
(b) an ability to design and conduct experiments, as well as interpret data
(c) an ability to design a system, component or process to meet desired needs within realistic
constraints such as economic, environmental, social, political, ethical, health and safety,
manufacturability, and sustainability
(d) an ability to function on multi-disciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of ethical and professional responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global,
economic, environmental, and societal context
(i) a recognition of need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use techniques, skills and modern engineering tools necessary for engineering
practice

Revised 8/28/13