**DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING**

# CE 260   Civil Engineering Methods   Spring 2017

## Course Description:

Course Description:  Provides students with in-depth experience in computer applications in Civil Engineering and with written and oral communication.  Students will learn AutoCAD Civil 3D and Revit through weekly assignments and final projects.

Prerequisite – FED 101, CE 101, CE 200/200A

## 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:   Stephanie R. Santos, P.E., P.P., CME, CM-BIM

Office: Colton Hall 215

Office Hours: Monday 2:30-3:30 PM, Wednesday 11:30 AM-12:30 PM, Fridays 3:30-4:30 PM or by Appointment

Email:  srr3@njit.edu

## Required Text:

1.  Autodesk Civil 3D 2016 Fundamentals
    Published by SDC Publications
    ISBN - 978-1-58503-968-5

2.  Autodesk Revit 2016 Structure Fundamentals
    Published by SDC Publications
    ISBN - 978-1-58503-972-2

## Course Sections:

**Section 002 – Mondays and Wednesdays @ 10:00 AM – 11:25AM (GITC 2315A)**

**Section 102 –Fridays @ 6:00PM – 9:05 PM (GITC 2315 A)**

| Week | Section Dates | | Topic/*Assignment* |
|---|---|---|---|
| | **002** | **102** | |
| 1 | 1/18<br>1/23 | 1/20 | Course Introduction<br>• Discussion of Civil Engineering Disciplines<br>• Discussion of FE/PE Requirements<br>• Introduction to BIM/Civil 3D/Revit |
| 2 | 1/25<br>1/30 | 1/27 | Fundamentals of Civil 3D<br>• User Interface, Toolspace, Templates, Settings, and Styles<br>Chapter 1 |
| 3 | 2/1<br>2/6 | 2/3 | Introduction to Survey Data<br>• Surveying Data Points and Point Groups<br>• Parcel Boundaries, and Labels<br>Chapters 3 & 4 |
| 4 | 2/8<br>2/13 | 2/10 | Roadway Design, Alignments, and Profiles<br>• Creating Profiles from Surface<br>• Creating Alignments<br>• Styles and Labels<br>Chapters 5, 6, & 7 |
| 5 | 2/15<br>2/20 | 2/17 | Roadway Design, Alignments, and Profiles <u>CONT.</u><br>• Creating Profiles from Surface<br>• Creating Alignments<br>• Styles and Labels<br>Chapters 5, 6, & 7 |
| 6 | 2/22<br>2/27 | 2/24 | Pipe Networks<br>• Pipe Editing and Annotations<br>• Layouts<br>Chapter 10<br><br>*QUIZ #1* |
| 7 | 3/1<br>3/6 | 3/3 | Pipe Networks <u>CONT.</u><br>• Pipe Editing and Annotations<br>• Layouts<br>Corridors<br>• Creating Corridors, Properties, and Styles<br>Utilizing Civil 3D for BIM Calculations<br>• Quantity Take Offs<br>Chapters 8, 10, & 11<br>*PIPE NETWORK PROJECT ASSIGNED* |
| 8 | 3/8<br>3/20 | 3/10 | Plan Production:  Model Spaces vs. Layout Space<br>• Utilizing Layout Tabs<br>• Title Blocks, Scales, North Arrows<br>• Plot Styles<br>Chapters 11 & 12<br><br>*PIPE NETWORK PROJECT DUE* |
| Spring Break | 3/13<br>3/15 | 3/17 | SPRING BREAK – NO CLASS |

| Week | Section Dates | | Topic/*Assignment* |
|---|---|---|---|
| | **002** | **102** | |
| 9 | 3/22 3/27 | 3/24 | Introduction / Fundamentals of Revit <br> • User Interface, Ribbon, Properties <br> • Drawing / Modifying Tools <br> • Titleblock Setup / Printing <br> Chapters 1 & 2 <br> ***FINAL PROJECTS ASSIGNED*** |
| 10 | 3/29 4/3 | 3/31 | Project Setup <br> • Levels and Grids <br> • Structural Columns <br> • Beams and Framing <br> Chapters 3, 4, & 6 <br> ***REVIT PROJECT ASSIGNED (002 ONLY)*** |
| 11 | 4/5 4/10 | 4/7 | Drawing Elements <br> • Creating and Modifying Walls <br> • Materials <br> Chapters 5 & 8 <br> Drawing Elements <br> • Creating Floors and Roofs <br> • Site Plan Design <br> Chapters 12 & 15 <br> ***REVIT PROJECT ASSIGNED (102 ONLY)*** |
| 12 | 4/12 4/17 | 4/14 (Good Friday – No Class) <br><br> 4/21 | Drawing Elements <br> • Footings and Foundations <br> Structural Reinforcement <br> • Adding Rebar <br> • Reinforcing Walls, Floors, and Slabs <br> Managing Views <br> • Creating Sections and Callouts <br> Chapters 7 & 9 <br><br> ***REVIT PROJECT DUE*** <br> ***(002 – 4/13) & (102 – 4/17)*** |
| 13 | 4/19 4/24 | 4/28 | Utilizing Revit for BIM Calculations <br> • Quantity Take Offs & Material Schedules <br> Plan Production <br> • Creating Sheets, Multiple Views <br><br> **FINAL PRESENTATIONS** |
| 14 | 4/26 5/1 | 5/2 | ***QUIZ #2*** <br> **FINAL PROJECTS DUE** |

# GENERAL COURSE INFORMATION

**Grading Policy:**

| | |
|---|---|
| Homework and In-Class Assignments | 25% |
| Instagram Participation | 5% |
| Quiz #1 | 15% |
| Quiz #2 | 15% |
| Civil 3D Project | 10% |
| Revit Project | 10% |
| Final Project | 20% |

**Grading Scale:**

| | |
|---|---|
| **A:** | **100-92** |
| **B+:** | **91-85** |
| **B:** | **84-80** |
| **C+:** | **79-75** |
| **C:** | **74-70** |
| **D:** | **69-60** |
| **F:** | **Below 60** |

**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).

**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 srr3@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.

## Items Required for this Course:

1. Textbook
2. Engineering Scale
3. Flash drive
4. Notebook

## Dress Policy:

Students are required to dress professionally for all oral presentations.

## Course Objectives Matrix – CE 260 Engineering Methods

| Strategies and Actions | Student Learning Objectives | Student Outcomes (a-k) | Prog. Educational Object. | Assessment Methods/Metrics |
|---|---|---|---|---|
| **Course Objective 1: Provide the students with the communication skills to function as civil engineers including written, oral, and computer based techniques.** | | | | |
| Indicate importance of communication skills in the life and functions of the civil engineer. | Students learn how communication skills are integral in their work and life. | g, k | 1, 2, 3 | Discussions, group presentations and paper. |
| Develop techniques for speaking (public speaking) and writing. | Learn to make presentations utilizing techniques discussed in class. | g, k | 1, 2, 3 | Oral and written Feedback. |
| Practice speeches and write papers. | Ability to make full length presentations and write papers. | g, k | 1, 2, 3 | Graded presentations and papers feedback. |
| **Course Objective 2: Provide the students with the capability of using CAD as a tool for selected civil engineering problems.** | | | | |
| Introduce CAD concepts. | Learn concepts as well as application to typical Civil Engineering problems. | a, e, k | 1 | Lab exercises. |
| Apply CAD to site project. | Learn the use of CAD road and lot layout. | a, e, k | 1 | Lab exercises. |
| **Course Objective 3:  Develop an understanding of the importance of effective communications in all phases of the life of the civil engineer.** | | | | |
| Discuss various aspects of communication and its importance in the life of the civil engineer. | Learn how communication skills is integral to all aspects of work and life. | g, i, k | 1, 2, 3 | Discussions, individual comments and written papers. |
| Simulate presentation modes such as job interview, project presentation, planning of presentation. | Ability to present in a simulated, real world environment. | g, k | 1, 2, 3 | Grading on presentations, written feedback, grading on written assignments. |

# 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