CE 502 Civil Construction Methods and Materials Spring 2017

Course Description: Civil Construction Methods will cover essential concepts in Civil and Construction Engineering. The course is designed to satisfy bridge requirements for a Master's in Civil Engineering. The course presents concepts with both a qualitative and a quantitative approach. Exposure to these concepts will prepare the student for graduate studies in the disciplines of Civil and Construction Engineering. This course also provides the student perspective and computational confidence whether out in the field, in the office, or in the classroom. Topics of discussion will include Construction Project Organization, Site Surveying, Force and Equilibrium Systems, Strengths of Materials, Construction Materials, Construction Framing, Soils Engineering, Construction Safety, and Foundation Systems.

Instructor: Adjunct Professor Brian Shiels bjs24@njit.edu 973-820-3783

Week Beginning	Topic	Text (Nunnally)	Text (Allen & Iano)
January 17	Construction Project Organization: Construction Industry, Contracts, Codes & Regulations, Terminology	Ch 1, 18	1
January 23 January 30	Introduction to Site Surveying: Basic Surveying Concepts, Leveling, EDM, GPS, Aerial, Maps, Topography, Site Drainage/Stormwater Runoff, Terminology & Calculations	Handouts	
February 6	Force Systems & Equilibrium Relationships: Concepts of Moment, Centroid, Simple Truss Analysis	Handouts	
February 13	Strengths of Materials: Concepts of Stress, Strain, Torsion, Fatigue, Bending Introduction to Construction Materials	Handouts	
February 20 February 27	Mechanical Properties of Materials: Apply Concepts of Statics and Strengths to Common Construction Materials (Steel, Concrete, Wood, Aluminum) Concrete Materials and Methods: Mix design, Admixtures, Terminology, Paving	Ch 7, 8, 12	3, 8, 9, 11, 13
March 13	Spring Recess		
March 20	Midterm Examination	Review	
March 27	Construction Framing Systems: Compare and contrast framing systems of common construction materials (Wood, Steel, Concrete, Masonry)	Ch 11, 12, 14, 15	4, 5, 8, 9, 10, 11, 12, 13, 14, 15
April 3	Intro to Soils & Geology: Origin of Soils, Overview of Concepts of Geology, Properties of Soils	Handouts	2
April 10	Soils Continued: Tests, Classification, Engineering Considerations	Ch 2 Handouts	2
April 17 April 24	Considerations of Soil in Practice: Excavation, Trenches, Compaction, Safety, Soil Filters, Soil Permeability, Ground Modifications	Ch 2, 5, 19 Handouts	
May 1	Foundation Systems: Bearing Capacity, Retaining Walls, Piles, Mat Foundations.	Ch 10 Handouts	2
May 8	Final Examination	Review	

Required Text: S. W. Nunnally, Constructions Methods and Management, 8th edition
Pearson ISBN-13: 978-0-13-500079-3

The required text by Nunnally discuses many aspects of the civil construction industry and includes several computation based discussions in addition to a brief overview of many aspects of construction.

Optional Text: Edward Allen & Joseph Iano, Fundamentals of Building Construction – Materials and Methods, 6th edition Wiley ISBN 978-1-118-13891-5

The optional text by Allen & Iano goes into more depth in several of the topics and has many useful descriptions and diagrams but is largely text-based and addresses the construction industry from an architectural perspective.

Course Format: Weekly lectures will be posted on Moodle in the form of a series of Modules that will hone in on specific topics of discussion for the week. Assigned readings from the required text will be supplemented with periodic handouts. Homework problems will include a combination of text and supplementary problems. All handouts and assigned homework will be posted on Moodle.

Grading: Homework will be assigned in Moodle. It may either be uploaded via Moodle, or you may email me either a document or pdf. Homework will count for 45% of the grade for the semester. The Midterm and Final Exam will cumulatively count for 50% of the final grade with the higher of the two grades accounting for 30% and the lower accounting for 20% of the final grade. %5 of the final grade will be based on communication on Moodle.

Course Policies:

- The NJIT Honor Code will be upheld and any violations will be brought to the immediate attention of Dean of Students.
- Students will be notified of any modifications or deviations from the syllabus throughout the semester.
- Make sure that your email address stated in pipeline is correct and you are using it regularly. Communication from the instructor will be sent only to the NJIT e-mail address.
- All material handed out or discussed in class by the instructor will be part of course material and students will be responsible for studying them in addition to the prescribed sections of the text book, unless otherwise noted.
- Homework / projects must be done in a manner consistent with professional engineering calculation in practice.
- Homework due dates will be announced in advance via Moodle.