

# New Jersey Institute of Technology

Department of Civil and Environmental Engineering

## CE 614 Underground Construction

### E-Learning

Fall 2016

**Prof. Alan Slaughter, P.E., P.P.**

Email: moodle 2 or slaughte@njit.edu, note which course you are inquiring about.

Mailbox: Colton Hall, CE Dept.

**Text: Introduction to Tunnel Construction; Authors:** David Chapman, Nicole Metje and Alfred Stark; **Publisher:** Spon Press; Paperback  
ISBN10: 0-415-46842-6 paperback or ISBN13: 978-0-415-46842-8 paperback

**Prerequisites:** Undergraduate course in soil mechanics.

**Course Description:** The course covers the various aspects of underground construction including rock and soft ground tunnel construction, shaft construction, inspection and rehabilitation of existing structures, open cut construction, blasting, and immersed tube tunnel construction.

### Course Outline

<u>Week No. /Date</u>	<u>Topics</u>	<u>Chapter Reading</u>
1/ Sept. 6 (Tues.)	Introduction – History <i>Introduction to Tunneling Wk., Part 1,2</i>	Chapt. 1
2/ Sept. 12	Geotechnical & Shafts <i>Wk. 2 and 3 Geotechnical &amp; Shafts</i>	Chapt. 2 <i>Parts 1, 2</i>

3/ Sept. 19	Geotechnical & Shafts <i>Wk. 2 and 3 Geotechnical &amp; Shafts</i>	Chapt. 2 <i>Parts 3, 4</i>
4/ Sept. 26	Groundwater Control and Open Cut <i>(paragraph on term paper is due)</i> <i>Wk. 4 Tunnels, Parts 1, 2, 3</i>	Chapt. 4.1, 4.2
5/ Oct. 3	Inspection of Tunnels <i>Wk.5 Inspection Parts 1,2</i>	
6/ Oct. 10	Rock Excavation – Blasting <i>Wk. 6 Blasting Parts 1,2</i>	Chapt. 5.6
7/ Oct. 17	Tunnel Boring Machine <i>TBM Parts 1, 2</i>	Chapt. 5.5
8/ <i>Oct. 24</i>	<i>Midterm Examination</i>	
9/ Oct. 31	Earth Tunneling Shield Tunneling Methods <i>Soft Ground Parts 1, 2</i>	Chapt. 5.1, 5.2, 5.3, 5.4,
10/ Nov. 7	Tunnel Linings <i>Soft Ground Parts 1, 2</i>	
11/ Nov. 14		
12/ Nov. 21	Immersed Tube Tunnels Microtunneling <i>Immersed Tube and Microtunneling Parts 1, 2</i>	Chapt. 5.9, 5.10, 5.11, 5.12
Nov. 24 – 27	<i>Happy Thanksgiving</i>	
13/ Nov. 28	Safety <i>Safety</i>	Ch. 6

14/ Dec. 5 Penn Station Tunnels  
*Penn Station Tunnels*  
Term Paper Due Dec. 5th

15/ *Dec.10* *Final Examination*

## **Homework**

Homework will be assigned during the semester on moodle. Each assignment will be due the following week.

## **Term Projects**

A list of potential project subjects will be provided. Students must select a project either from a list provided or some other source. On Week 4 or before, students will submit a one paragraph topic description on moodle.

The project report will be **10** pages, including text, photos, drawings and the like. The report will be prepared in an organized and professional manner. (*Neatness counts*)

## **Grading**

1. Homework	15%
2. Midterm	25%
3. Term Project	30%
4. Final	<u>30%</u>
Total	100%

### **Important Notes:**

1. The NJIT Honor Code will be upheld in this course. Any violations will be brought to the immediate attention of the Dean of Students.
2. Any modifications or deviations to the syllabus throughout the semester will be made through consultation and agreement with the class.