

New Jersey Institute of Technology

Department of Civil and Environmental Engineering

CE 614 Underground Construction

E-Learning

Spring 2018

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

Email: georgian1899@aol.com, note which course you are inquiring about.

Office Hours: Office hours do not apply to this course, but I can be contacted by email.

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/ Jan. 16	Introduction – History <i>Introduction to Tunneling Wk.</i>	Chapt. 1 <i>Part 1,2</i>
2/ Jan. 22	Geotechnical & Shafts <i>Wk. 2 and 3 Geotechnical & Shafts</i>	Chapt. 2.2 to 2.3 <i>Parts 1, 2</i>

3/ Jan. 29	Geotechnical & Shafts <i>Wk. 2 and 3 Geotechnical & Shafts</i>	Chapt. 2.4 to 2.5 <i>Parts 3, 4</i>
4/ Feb. 5	Tunnel Analyses	Chapt. 3
5/ Feb. 12	Groundwater Control and Open Cut <i>(paragraph on term paper is due)</i> <i>Wk. 4 Tunnels</i>	Chapt. 4 <i>Parts 1, 2, 3</i>
6/ Feb. 19	Inspection of Tunnels <i>Wk.5 Inspection</i>	<i>Parts 1,2</i>
7/ Feb. 26	Rock Excavation – Blasting <i>Wk. 6 Blasting</i>	Chapt. 5.6 <i>Parts 1,2</i>
<i>8/ Mar. 4</i>	<i>Midterm Examination</i>	
<i>Mar.11 thru Mar. 18 Spring Break</i>		
9/ Mar. 19	Tunnel Boring Machine <i>TBM</i>	Chapt. 5.5 <i>Parts 1, 2</i>
10/ Mar. 26	Earth Tunneling Shield Tunneling Methods <i>Soft Ground</i>	Chapt. 5.1, 5.2, 5.3, 5.4, <i>Parts 1, 2</i>
11/ Apr. 1	Tunnel Linings <i>Soft Ground</i>	<i>Parts 1, 2</i>
12/ Apr. 8	Immersed Tube Tunnels Microtunneling <i>Immersed Tube and Microtunneling</i>	Chapt. 5.7 to 5.12 <i>Parts 1, 2</i>
13/ Apr. 15	Safety <i>Safety</i>	Chapt. 6
14/ Apr. 22	Ground Movements and Monitoring Term Paper Due Apr. 22	Chapt. 7

15/ Apr. 29

Case Studies (if time permits)

Chapt. 8

May 5

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.