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  

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

<table>
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<tr>
<th>Week No. /Date</th>
<th>Topics</th>
<th>Chapter Reading</th>
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<tr>
<td>1/ Sept. 6 (Tues.)</td>
<td>Introduction – History</td>
<td>Chapt. 1</td>
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<td></td>
<td>Introduction to Tunneling Wk., Part 1,2</td>
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<tr>
<td>2/ Sept. 12</td>
<td>Geotechnical &amp; Shafts</td>
<td>Chapt. 2</td>
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<td></td>
<td>Wk. 2 and 3 Geotechnical &amp; Shafts</td>
<td>Parts 1, 2</td>
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3/ Sept. 19  Geotechnical & Shafts  Chapt. 2  
Wk. 2 and 3 Geotechnical & Shafts  Parts 3, 4

4/ Sept. 26  Groundwater Control and Open Cut  Chapt. 4.1, 4.2  
(paragraph on term paper is due)  
Wk. 4 Tunnels, Parts 1, 2, 3

5/ Oct. 3  Inspection of Tunnels  
Wk. 5 Inspection Parts 1, 2

6/ Oct. 10  Rock Excavation – Blasting  Chapt. 5.6  
Wk. 6 Blasting Parts 1, 2

7/ Oct. 17  Tunnel Boring Machine  Chapt. 5.5  
TBM Parts 1, 2

8/ Oct. 24  Midterm Examination

9/ Oct. 31  Earth Tunneling  Chapt. 5.1, 5.2, 5.3, 5.4, 5.5  
Shield Tunneling Methods  
Soft Ground Parts 1, 2

10/ Nov. 7  Tunnel Linings  
Soft Ground Parts 1, 2

11/ Nov. 14

12/ Nov. 21  Immersed Tube Tunnels  Chapt. 5.9, 5.10, 5.11, 5.12  
Microtunneling  
Immersed Tube and Microtunneling Parts 1, 2

Nov. 24 – 27  Happy Thanksgiving

13/ Nov. 28  Safety  Ch. 6  
Safety
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          30%
     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.