**CIV E 481 SYLLABUS**

COURSE NAME: Soil Engineering- CIV E 481
DETAILS: 3 hour lectures, 3/2 hour Lab
TERM: Fall

COURSE DESCRIPTION

\*3.8 (fi 8) (either term, 3-0-3/2) Site investigation; strength of soils; geosynthetics for soil improvement;

design of excavations and earth pressures on retaining structures; stability of natural slopes and their

improvement; design of cuts and embankments; foundation design, stability and settlement; pile

foundations; frost action and permafrost.

Building on the basics of soil mechanics learnt in CIVE 381, the objective of this course is to develop an

understanding of the geotechnical design principles for shallow and deep foundations, earth pressures and

retaining walls, slope stability and finally, how site characterization is undertaken to provide geological and

soil properties for these designs.

REQUIRED MATERIAL

**(Mandatory):**

None - All key texts/references are provided on eClass

**(Recommended):**

Important but not required Reference(Important Chapters are provided in eClass):

Complete Copy - Canadian Foundation Engineering Manual (CFEM), 4th Edition, Canadian Geotechnical

Society.

(These can be purchased from BiTech Publishers: http://bitech.ca/books\_from\_bitech.php)

OPTIONAL but valuable reference:

Salgado, R. 2008. The Engineering of Foundation. New York: McGraw-Hill.

Holtz, R.D., W.D. Kovacs, and T.C. Sheehan, 2010. An Introduction to Geotechnical Engineering. 2nd ed.,

Prentice Hall

Optional References:

Das, B. M. 2016. Fundamentals of Geotechnical Engineering, Cengage.

Bowles, Joseph E., 1988. Foundation Analysis and Design, New York: McGraw-Hill.

LECTURE CONTENT

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| **Date** | **Lecture Topic** | **Sections in CFEM** | **Tutorial Schedule** |

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| **WEEK 1**Wed, Sept 4 | Review |  |  |
| Fri, Sept 6 | Review |  |
| **WEEK 2**Mon, Sept 9 | Shallow Foundation | Chapter 10 & 11 |
| Wed, Sept 11Fri, Sept 13 | Shallow Foundation Shallow Foundation | Chapter 10 & 11Chapter 10 & 11 |
| **WEEK 3**Mon, Sept 16 | Shallow Foundation | Chapter 10 & 11 | Tutorial #1: D1 |
| Wed, Sept 18Fri, Sept 20 | Shallow Foundation Shallow Foundation | Chapter 10 & 11Chapter 10 & 11 | Tutorial #1: D2 |
|  **WEEK 4**Mon, Sept 23 | Shallow Foundation | Chapter 10 & 11 |  |
| Wed, Sept 25Fri, Sept 27 | Deep Foundations Deep Foundations | Chapter 17, 18 &19Chapter 17, 18 &19 |  |
| **WEEK 5**Mon, Sep 30 | Deep Foundations | Chapter 17, 18 &19 |  |
| Wed, Oct 2Fri, Oct 4 | Deep Foundations Deep Foundations | Chapter 17, 18 &19Chapter 17, 18 &19 |  |
| **WEEK 6**Mon, Oct 7 | Deep Foundations | Chapter 17, 18 &19 | Tutorial #2: D1 |
| Wed, Oct 9Fri, Oct 11 | Deep Foundations Deep Foundations | Chapter 17, 18 &19Chapter 17, 18 &19 | Tutorial #2: D2 |
| **WEEK 7**Mon, Oct 14 | No Lecture (Thanksgiving) | Chapter 17, 18 &19 |  |
| Wed, Oct 16Fri, Oct 18 | Earth Pressure Earth Pressure | Chapter 24 & 26Chapter 24 & 26 |  |
| **WEEK 8**Mon, Oct 21 | Earth Pressure | Chapter 24 & 26 | Tutorial #3: D1 |
| Wed, Oct 23Fri, Oct 25 | Retaining Walls Design**Midterm review** | Chapter 24 & 26Chapter 24 & 26 | Tutorial #3: D2 |

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| **WEEK 9**Mon, Oct 28 | Retaining Walls Design | Chapter 24 & 26 |  |
| **Tues, Oct 29**Wed, Oct 30Fri, Nov 1 | **MIDTERM EXAM, 5:00 – 7:00 pm**Retaining Walls Design Retaining Walls Design | **Place TBD**Chapter 24 & 26Chapter 24 & 26 |
| **WEEK 10**Mon, Nov 4 | Retaining Walls Design | Chapter 24 & 26 | Tutorial #4: D1 |
| Wed, Nov 6Fri, Nov 8 | Excavations Excavations | Chapter 24 & 26Chapter 24 & 26 | Tutorial #4: D2 |
| **WEEK 11**Mon, Nov 11 | No lecture Remembrance Day |  |  |
| Wed, Nov 13Fri, Nov 15 | No Lecture (Fall Term Class Break) No Lecture (Fall Term Class Break) |  |  |
| **WEEK 12**Mon, Nov 18 | Slope Stability | Handout |  |
| Wed, Nov 20Fri, Nov 22 | Slope Stability Slope Stability | Handout Handout |  |
| **WEEK 13**Mon, Nov 25 | Slope Stability | Handout | Tutorial #5: D1 |
| Wed, Nov 27Fri, Nov 29 | Slope Stability Slope Stability | Handout Handout | Tutorial #5: D2 |
| **WEEK 14**Mon, Dec 2 | Slope Stability | Handout |  |
| Wed, Dec 4Wed, Dec 6 | Slope Stability**Review for Final Exam** | Handout |  |

LAB CONTENT

No lab content found in syllabus.