

FAMU-FSU College of Engineering
Department of Civil & Environmental Engineering
Geotechnical Design (CEG 4801)
Course Syllabus
Fall 2009

Catalog Data 2003-2005	CEG 4801 Geotechnical Design
Credit:	3.0
Catalog Description:	Design of different geotechnical structures including shallow foundations, slopes and embankments, earthwork with geosynthetics. Determine soil properties in the laboratory and write formal reports.
Prerequisite:	Site Investigation CEG 2202C Soil Mechanics CEG 3011 (You should have a grade of C or better in your prerequisites to be allowed to take this class. If you don't meet the prerequisite requirements you, will be dropped from the course at any time during the semester.)
Textbook:	- Das B. "Principles of Geotechnical Engineering," 6th Edition, CENGAGE Learning 2006.
Additional References:	- Liu,C., and Evett, J.B., "Soils and Foundations," Prentice-Hall, Inc., N.J. 1981. - Bowles, J.E., " Foundation Analysis and Design," McGraw-Hill Book Co. 1986. - Jumikis, A.F., "Foundation Engineering," Intext Educational Publishers, 1971.
Instructor/Class Room:	Kamal Tawfiq, Ph.D., P.E. Room: A313 Tu - Thr 5:45 PM – 7:00 PM
Office Hours:	M to Thr 10:00 AM – 12:00 PM - or by appointment Room 129
Laboratory Requirements: 1- Instrumentation Lab 2- Computer Lab	<ol style="list-style-type: none"> 1. Direct Shear Test for Shear Strength Measurements 2. Develop your own software for Analysis and Design of Retaining Walls 3. Develop Slope Stability Design Charts 4. Use of PCStabl for slope stability analysis and design
Course Objectives - Educational Outcomes: (Numbers in Parenthesis indicate Department Outcomes)	<p>This main objectives of the course are</p> <ol style="list-style-type: none"> 1- To use the knowledge of soil mechanics to identify, formulate and solve practical geotechnical problems and to develop the required proficiency needed to analyze and design different geotechnical systems. (5- 12) 2- To conduct standard soil testing procedures to determine mechanical and index properties soils and analyze laboratory/field testing results with respect to a given practical application. (2) 3- The introduce the state of knowledge in contemporary subjects such as MSE Walls (11) 4- Use computational tools to analyze and design retaining walls, foundations, and embankments (10, 11) 5- Search for additional information outside the domain of the textbook or class handouts (9) <p>Students who successfully meet the instructional objectives of the course will be able to analyze and design various types of geotechnical systems including retaining walls, slope and embankments, and foundations.</p>
Student Learning Tasks as related to the course objectives:	<ol style="list-style-type: none"> 1- Homework assignments related to soil properties, and geotechnical applications (Objectives 1, 2,3) 2- Laboratory reports on assigned soil testing (Objective 2) 3- Project reports on site characterization and field trips (Objective 1,4,5) 4- Exams (Objective 1, 2, 3, 4, 5)

Course Assessment:	<p>To meet the course objectives/program outcomes the course will be assessed using the following instruments:</p> <ol style="list-style-type: none"> 1- Student performance in homework assignments 2- Quizzes 3- Exams 4- laboratory Reports 5- Design Projects <p>Course learning objective # 5 shall be demonstrated in the project reports, and laboratory reports.</p>														
Professional Component of the Course	The course will teach civil engineering students how the design and construction interact to determine the constructability of any foundation project.														
Topics /Time Schedule/ No. of Sessions:	<p style="text-align: center;"><u>Course Topic</u></p> <p>1- Geotechnical Investigation</p> <p>2- Earth Pressure Methods</p> <p>3- Analysis of Retaining walls, Open trenches</p> <p>4- Exam # 1 (Includes parts 1,2 &3)</p> <p>5- Slope stability Analysis</p> <p>6- Analyses and Design of Foundations</p> <p>7- Exam # 2</p>	<p style="text-align: center;"><u>Sessions</u> (2 Sessions/week)</p> <p style="text-align: center;">4</p> <p style="text-align: center;">3</p> <p style="text-align: center;">5</p> <p style="text-align: center;">1</p> <p style="text-align: center;">6</p> <p style="text-align: center;">3</p>	<p style="text-align: center;"><u>Covered Time</u></p> <p style="text-align: center;">5 hr</p> <p style="text-align: center;">4:15 hr</p> <p style="text-align: center;">6:25 hr</p> <p style="text-align: center;">1:15 hr</p> <p style="text-align: center;">7:50 hr</p> <p style="text-align: center;">5:15 hr</p> <p style="text-align: center;">2:00 hr</p>												
Relationship to the program objectives:	The course is will provide civil engineering graduates with sufficient knowledge to enter professional practice or to continue their studies at a graduate level. (<i>Objective 3</i>)														
General Policy:	See attached sheet														
Course Grading Policy:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1- Homework Assignments</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>2- Quizzes</td> <td style="text-align: right;">05%</td> </tr> <tr> <td>2- Projects</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>3- Exam # 1</td> <td style="text-align: right;">25%</td> </tr> <tr> <td>4- Exam # 2</td> <td style="text-align: right;"><u>30%</u></td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: right;">100%</td> </tr> </table>			1- Homework Assignments	20%	2- Quizzes	05%	2- Projects	20%	3- Exam # 1	25%	4- Exam # 2	<u>30%</u>	Total	100%
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Honor codes and policy on cheating:	<p>Students are required to follow the code of their university. The relationship between students and instructors is based upon trust, and the continued maintenance of this trust is necessary for education to be successful. Students need to trust that the instructor has made appropriate judgments as to the content and structure of the course. Instructors need to trust that the work turned in by students represents their own effort. Violation of this trust undermines the educational process. Cheating is dishonest and it will not help anybody toward his/her final goal, which is to become a competent engineer. Cheating implies taking credit for somebody else's work. Cheating on exams and other acts of academic dishonesty will not be tolerated and will be dealt with at the instructor's discretion. Severe violations may (and will) be punished with a failing grade in the course. Please refer to student handbook of each university for more information.</p>														

Students with disabilities:	<p>The instructor will accommodate any student with a qualifying disability as defined in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disability Act of 1990, and supported by a confirmation statement. Students with disabilities needing academic accommodations should: 1. Register with and provide documentation to the FAMU Office of Special Programs (OSP) or the FSU Student Disability Resource Center (SDRC), respectively. 2. Bring a letter to the instructor from OSP/SDRC indicating a need for academic accommodations. This should be done within first week of class.</p> <p><i>For more information about services available to students with disabilities, contact:</i></p> <p>1. FAMU students: Office of Special Programs, Student Union Building, Rm. 204. 2. FSU students: Assistant Dean of Students: sdrc@admin.fsu.edu, Disabled Student Services, 08 Kellum Hall.</p>
Prepared by:	Kamal Tawfiq. Ph.D., P.E.

General Course Policy:

- 1- Your GPA in the course will be based on a total of 100%. The final grades will be set based on the general performance of the class. The class grades will be averaged to obtain the mean (x_{ave}) value and then the first standard deviation (σ_{n-1}) will be used to set the B, C, D ranges. Grades above $x_{ave} + \sigma_{n-1}$ will be in the A range. Those below $x_{ave} - \sigma_{n-1}$ will be in the F range. B, C and D will be distributed between $x_{ave} + \sigma_{n-1}$ and $x_{ave} - \sigma_{n-1}$.
- 2- Grads will be posted after each exam to show the students their level of performance level. With the assistance of the instructor, each student is encouraged to assess him/herself during the semester. Doing so, will help the student to improve or strengthen his/her performance.
- 3- More references and additional instructional materials are available to the instructor. If you need to widen your scope of knowledge in geotechnical engineering ask for these references.
- 4- The due date for each exam, homework, and project reports will be announced in advance.
- 5- Late assignments and project reports will not be accepted.
- 6- It is very important that you participate in the class activities. Bring your class notes and text book every time you attend a lecture
- 7- Without a valid reason, you are not allowed to leave the class room once the lecture has started. This conduct is irritating to the instructor and disturbing to the students. Certain circumstances may require that you leave the room during the lecture. In this case, you may need to inform the instructor in advance of your intention
- 8- All the exams will be closed-book. The necessary materials such as charts, tables, and figures will be given to you
- 9- The term projects will be group efforts. Each group will consist of 3 to 4 students depending on the class size. Each student in the group must demonstrate his or her efforts in the project. It is not unusual that few students may sit aside watching the others carrying on the task. If you fail to cooperate with your group, for any reason, inform the instructor immediately.
- 10- Projects may be divided into phases. The due date for each phase will be announced in the class. There will be a report for each phase and this report must be submitted to the instructor in order to earn the grads on the final submittal. The final report shall include the following:

- Statement of the problem
- Method of analysis
- Procedures and final results using developmental tools (Computer printout)
- Figures
- Other details
- References
- **Additional references will be given special consideration**

- *Word processing and other graphic programs shall be used to produce the text, figures, and charts of the final report. Handwriting/drawing will not be accepted.*