

DEPARTMENT OF CIVIL ENGINEERING  
UNIVERSITY OF ARKANSAS  
FAYETTEVILLE, ARKANSAS 72701

9 March 2016

MEMORANDUM FOR STUDENTS ENROLLED IN CVEG 5143

SUBJECT: Administrative Instructions, 5143 Transportation Soils, Spring Term AY 2016.

**General:**

Meeting Time: TBD in class  
Location On-Line (learn.uar.edu)  
Prerequisites Soil Mechanics, CVEG3133  
Soil Mechanics Lab, CVEG3130  
Instructor Norman D. Dennis, Jr.  
Office: 4188 Bell Engineering Center  
Phone: 479-575-6011  
Email: [ndennis@uark.edu](mailto:ndennis@uark.edu)  
Office Hours: By arrangement, normally in the evenings.  
Home: 479-856-6072 Before 9:30PM CT weekdays after 8:00 AM CT on weekends.

1. **Course Description** This course provides an in depth look at the use of soil in the construction of dams, road embankments, levees and other fills. Earth structures are any natural or man made facility composed of soil or rock. This course investigates the soil mechanics related to the design of earth structures. As a first step we will establish the need for soil testing and quality control in earthworks projects. Once establishing the need we will explore the engineering properties of compacted soil. We will then cover the concepts of soil stabilization as they relate to the construction of embankments and the stability of natural and man made slopes. We will also explore the issues related to various ground improvement techniques such as deep soil mixing, grouting, inclusions deep compaction and vibro-flotation. Finally, we will we will learn several procedures for analyzing slopes and embankments to determine factors of safety.
2. **Course Objectives:** When you complete this course you should be able to to the following:
  - a. **Measurement of Soil Properties:**  
Select the appropriate field or laboratory tests to measure soil properties  
Describe then conduct and interpret data from:
    - Resilient Modulus tests
    - CBR tests
    - Standard and Modified Procter tests.
    - All types of triaxial tests
    - SPT and CPT, FWD, DCP, field vane, and pressure meter tests
  - b. **Compaction Techniques:**  
Describe the behavior of compacted soil  
Select appropriate compaction equipment for shallow and deep compaction

- Develop compaction specifications for shallow and deep compaction.
- Establish a quality control plan for compaction.
- c. Soil Stabilization/Treatment:
  - List the properties of various soil additives
  - Determine the correct additive to improve a particular soil type
  - Establish an appropriate design and field quality control protocol.
- d. Ground Improvement
  - Identify conditions that require ground improvement.
  - Describe the process of the various ground improvement techniques
  - Recognize problems associated with various improvement techniques.
  - Develop appropriate quality control programs for ground improvement techniques.
- e. Slope Stability
  - Identify causes of instability
  - Use chart type analysis procedures
  - Perform hand calculations using method of slices
  - Use commercial software to solve stability problems
  - Evaluate the effects of seepage on stability.
  - Specify improvement techniques for unstable slopes

### **3. Texts and References:**

- a. There is no assigned text for this course. However, you may be required to visit the university library and obtain copies of reports or journal articles for use as discussion guides.
- b. Course Supplements. At specific points in the course we will use course supplements to present information not specifically covered in the assigned journal articles.

### **4. Examinations, Homework and Grading:**

- a. Examinations: CVEG 5143 has two exams during the semester as indicated in the Course Schedule.
- b. Quizzes. Quizzes will be given at the discretion of the instructor. Specific points associated with the quizzes will be rolled into the Instructor Grade in the grading plan.
- c. Homework. You may be assigned daily homework at the beginning of each class. Typically these problems are textbook like problems, i.e. short well defined problems with one correct answer. Homework will be due in accordance with the class schedule. All homework will be submitted through Blackboard. Homework turned in after scheduled time will not be graded.
- d. Solutions. Solutions to homework problems, exams, lab reports, or any other special problems, will posted on Blackboard two days after the scheduled turn-in date.
- e. Late Submissions. For major homework assignments late work will be accepted if coordination is made prior to the turn-in date. Work turned in late will be assessed a late penalty of 10% per day. The first 10% cut begins on the due date! A report or problem due at 11:59 AM but submitted at 12:05 AM on the next day will receive a 10% cut. Additional

10% decrements will be made on subsequent days. Work will not be accepted beyond two days late without special coordination affected well in advance of the due date.

f. Instructor Grade. Points will be assigned at my discretion based on quizzes, class participation, homework problem effort, and any group submission participation. The primary emphasis for the instructor grade will be the homework problem submissions, class participation and scores on quizzes.

g. Grade Summary:

ITEM	POINTS	PERCENT
Exams (2 @ 200 pts ea)	400	29
Special Problems (4@ 100 pts)	400	29
Report/Presentation	400	29
Instructor Evaluation	200	13
<b>TOTAL</b>	<b>1400</b>	<b>100.00%</b>

h. Raw score conversions to letter grades follow.

A	1260 points	(90% of 1400 points)
B	1120 points	(80% of 1400 points)
C	980 points	(70% of 1400 points)
D	910 points	(65% of 1400 points)
F	909 points or below	(less than 65% of 1400 points)

### Special Problems (SPs):

- a. Special Problems. CVEG 5143/4153 has four Special Problems (SPs).
  - (1) SP1 – Slope Stability Analysis (100 pts)
  - (2) SP2 – Laboratory Testing Report/Presentation (100)
  - (3) SP3 – Earthwork Quality Control Plan (100 pts)
  - (4) SP4 – Deep Ground improvement Quality Control Plan (100 pts)
- b. Admin Instructions: Instructions specific to each SP will be covered in the administrative instructions associated with the specific problem. Issue/due dates for each problem are noted on the Course Schedule.
- c. Group Work. Discussion among all students is authorized and encouraged. However, this discussion should be an active exchange of information (an individual contributes his own ideas and knowledge as well as receives ideas and information from the comments of others). It is the responsibility of each student to indicate the source of ideas and facts received from others (see para 9).

### 5. Report/Presentation:

- a. You will be required to do a literature review and prepare a written report (term paper) on a narrowly focused topic within the broad category of earth structures. As part of the report/presentation requirement you will prepare a 20-25 minute video which will be uploaded to Blackboard and may be viewed by other students

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in the class. You will then be given 15 minutes of discussion time to lead a Q&A or problem solving session. Your grade will be based on the quality and completeness of both the report and presentation. Your presentation will be graded by both myself and the rest of the class.

- b. A list of potential topics will be distributed during the third week of class. However, you should feel free to suggest a topic of your choosing.

## **7. Course Policies:**

- a. Attendance: It is my intent to find a virtual meeting time where the entire class or sub-sets of the class can meet with me to discuss any issues. The success of this will depend on all our schedules. At a minimum I expect every one to participate in the discussion board.
- b. Study Assignments: Study assignments for each lesson are in the class schedule and will be posted to Blackboard. The assignments are the basis for classroom discussion and problems. You should complete any reading assignments to get the general concepts and familiarize your self with the homework assignment before you listend to the recorded class.
- c. Solutions. Solutions to homework problems and exams, will be posted to Blackboard two days after the due date or once individual work is graded, whichever comes first.
- d. Additional Instruction (AI): You and your understanding of the material are my primary responsibility. If you are having a difficult time understanding a concept, contact me by email or otherwise coordinate a time for AI on as needed basis. Remember, AI is to answer specific questions regarding problem solving techniques or concepts, not to rehash the lecture.

## **8. Written Submissions:**

- a. Organization/Neatness of Submissions: A significant part of engineering is written communication of laboratory work and analysis/design proposals. Heavy emphasis will be placed on the clarity, organization, and readability of your work. I will exercise significant freedom in decrementing work due to poor "readability."
- b. Documentation. The McGraw-Hill College Handbook governs written submissions. Submissions, except routine homework, must be typed and comply with the McGraw-Hill Handbook or another appropriate style reference. Assistance from me need not be acknowledged, however, assistance from other instructors or other students must be properly acknowledged as a parenthetical note and a proper bibliographic citation. Obviously information extracted from normal external references (journals, books, etc.) must have appropriate notation and bibliographic citations.

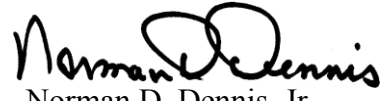
## **9. Academic Integrity**

As engineers you are responsible for upholding the canons of ethics of the profession. A test of your ability to do so is to uphold the University's Academic Integrity Policy. See <http://honesty.uark.edu/policy/index.php> for the policy and

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<http://honesty.uark.edu/sanction-rubric/index.php> for the sanction rubric. While I don't anticipate problems of this nature in this class, any instance of academic dishonesty, as defined by the University Policy, will be dealt with immediately and severely in accordance with the published procedures. The absolute minimum sanction for academic dishonesty will be a grade of zero for the work in question.

Have fun. What could be better than taking Transportation Soils in the Springtime!!



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Civil Engineering