CENG 4381 Administrative Instructions – Fall 2021

Course Specific Policies

1. CENG 4381 Foundation Design
   Class Time: Tuesday and Thursday 7:00 p.m. – 8:20 p.m.
   Class Room: HEC - B210

2. Instructor: Jeff Rodgers, PE, PG
   Email: jrodgers@uttyler.edu

3. **Office Hours:** Office hours will be by Zoom appointment only.

4. **Course website:** UT Tyler's Canvas website.

5. This class is an in-person class. If requirements change due to circumstances as a result of COVID-19, we will meet in a real-time face-to-face Zoom setting.

6. Welcome to CENG 4381 – Foundation Design. In this course we will explore different aspects of foundation design and expand on the knowledge you gained in soil mechanics. It is the intent of the course to teach you to apply basic soil and structural mechanics principles to solve foundation problems and to modify these solutions based on practical considerations. I am confident that you will find this course to be interesting, challenging, and rewarding. A tentative course schedule is provided in Attachment 1.

   Foundation engineering involves the design of the structural elements interfacing with the ground to provide satisfactory support. It has been said that soil mechanics is the science while foundation engineering is an art. In soil mechanics, idealized systems are often assumed and the application of appropriate theories results in solutions to the idealized problems. However, real soils are heterogeneous and many of the assumptions necessary to apply theoretical soil mechanics principles are not truly valid. Hence, considerable judgment based on knowledge and experience is necessary to solve real problems and a significant portion of any problem involves properly defining the problem.

   This class introduces the concepts of defining the problem and helping you gain the knowledge requisite to solve foundation problems. Principal topics covered within this course include subsurface exploration, as well as analysis and design of shallow foundations, deep foundations, and earth retaining structures. Specific course objectives are provided in Attachment 2.

7. If you will miss a scheduled class, you are still responsible for the material.

8. You are encouraged to seek additional instruction by appointment. I do not have scheduled office hours due to a work commitment, but will schedule a face-to-face Zoom meeting for office hours.

9. Class Room Procedures:

a. Bring study notes, textbook, note-taking material, and calculator to every class. You may not borrow or exchange calculators during graded events. If your calculator fails during a graded exercise, I am not responsible to furnish a substitute. Class preparation is your individual responsibility. Please refer to Calculator Policy below.

b. Textbooks: ***Principles of Foundation Engineering, Ninth Edition by Braja M. Das, 2019 ISBN 9781337705028.*** Note: Seventh and Eighth Editions may also be used.

c. You are not typically required to use colored pencils or a straight edge, but colors and straight lines sure can help with emphasis and clarity in your notes.

d. There may be unannounced reading quizzes given at the first of class, throughout the semester. It is your responsibility to come to class having completed the reading assignment.

e. It is a basic principle of professionalism that **"Professionals are not Late."** Please come to class on time and leave on time. Interruption of lecture is not acceptable.

10. Course Materials:

a. I will post some course materials on Canvas. Canvas enrollment is now automatic with course registration, but you should ensure that you can access the class Canvas page.

b. I may also on occasion email you homework tips or points of clarification that are made aware to me outside of class. All email correspondence will take place through the Canvas system, and therefore using your Patriot email accounts; so check your Patriot email account often.

11. Exams and Grading:

a. Grade Breakout and Cutoffs:

Grade Breakdown

Mid-term Exams	25%
Assignments/Quizzes	40%
Professional Practice	10%
Final exam	25%

Letter grades will be assigned based on the final course grade:

A	90 and above
B	80 to 89.99
C	70 to 79.99
D	60 to 69.99
F	below 60

If you earn a cumulative average of less than 60% on all exams, or if you fail to earn at least 60% on the final exam you may fail the course, **regardless of your course grade**. The distribution shown above is to graphically remind you of how well you are doing.

b. Mid-term Exams and Final Exam:

1) The dates for all exams are included in the course schedule. Official reasons for missing an exam are outlined in the UT Student Handbook. You are required to take a make-up Exam, regardless of your reason for missing the scheduled Exam. Report any conflict to me as soon as possible prior to the Exam.

2) The mid-term exams and final exam will typically have two sections: a closed book and open book portion.

3) Solutions to exams will not be posted on Canvas, but you may schedule an appointment with me and we can go over exam solutions.

4) Pop quiz is a short test given to students **without prior warning**. The dates for all pop quizzes are NOT included in the course schedule. Pop quiz typically contains one problem and it is 10 to 15 minutes long.

c. Calculator Policy: Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are caught using a non-approved calculator.

d. Laptops/PDAs/MP3 players/Cell Phones or other electronic devices: The use of any electronic device, except an approved calculator, is not permitted during lessons and exams. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device. The use of phones and MP3 players is not permitted during lessons.

e. Collection of Student Work: Throughout the semester I will collect student work (best, average, and worst) for the ABET course and outcomes notebooks. This will require me to make a copy of your work, keep your original and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

f. Embedded indicators of accomplishment of program outcomes: At times throughout the semester, portions of student work will be analyzed to determine if our program is accomplishing stated program outcomes based on established metrics. If your work is below the minimum established metric, you will be required to repeat the assignment or that portion of the assignment until you achieve the minimum acceptable standard based on the metric.

12. **Homework assignments and projects**: The purpose of homework assignments and projects is to help reinforce what was taught in class. It helps to prepare students for exams and tests, including statewide exams. Completing homework assignments and projects makes students more responsible and helps them learn time management skills. It gives students another chance to review class material.

Homework assignments and design projects will be assigned on a weekly to semesterly basis. Students may *discuss* their homework solutions with one another, but each student must do his/her own, **independent** assignments (i.e. you may not just copy someone else's homework). If you receive assistance from a fellow student on a particular problem, you must cite that assistance within your solution. The homework due date is marked on the assignment. Homework is due *before* class starts. **Assignments turned in after class starts will be considered late and will not be accepted.**

Assignments may be turned in late if coordinated with me in advance. Homework turned in late **that has been coordinated with me in advance** will have the following reductions applied to the assignment:

One day late – 25% reduction
Two days late – 50% reduction
Three days late – 75% reduction

No credit will be given for homeworkturned in more than three days late or after the solution has been published on the course Canvas.

Obviously, there are circumstances that will occur and make a timely submission impossible and I willwork with you when those circumstances legitimately occur.

FORMAT: The production of a neat, organized, high-quality homework assignment and project cannot be overestimated nor can its importance to your course grade be overstated. A homeworkshould be something you are proud of and not something hastily "slapped together". Toward this end, considerable emphasis will be placed on not only getting the correct answer but also on how the solution is presented.

All homework is mandatory, including problem sets. As an engineer your goal is to make a clear, logical, and professional presentation of your work. As such both your presentation and the accuracy of your work is important, and both will be graded. It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. No guess work should be required to see what you did. All submissions are due at the beginning of class on the due date. Submissions may be handed in to the instructor prior to the start of class.

1) **Use Engineer paper only** with solutions placed in the logical flow of the problem printed on engineering paper; one side only. Clearly present **a brief problem statement or a sketch** with your solution. Clearly and concisely explain each step. For narratives of more than a line or two, use your word processor or the text capability if you are using MathCAD or Excel. If you are writing out a paragraph or more, you must type it in a word processing package (for projects).

2) Late Submissions. It is a basic principle of professionalism that **"Professionals are not Late".** A "COORDINATED LATE" submission occurs when you will miss the deadline for a graded homework assignment, and you contact me in advance. Notification immediately before the submission will not suffice. Deductions to your assignment grade for late submissions will be given.

3) All homework in this course must be properly documented. As you are having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me are considered immediately available to all students and need not be acknowledged or documented. YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED. Documentation will be accomplished in accordance with any manual for writing, footnote or endnote, for papers, but for written homework, just place the documentation right at the point you received help describing who and what assistance.

Assigned readings. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered. To help motivate you to do the reading there may be unannounced quizzes that cover the assigned sections of the text.

13. There may be opportunities to earn bonus points for additional work on problem sets, exams, or for completion of other optional assignments. Opportunities for bonus points will be clearly identified by me and announced in class. Make use of these opportunities to extend your learning!

14. Professional Practice. During this semester, a portion of your grade in this course (10%) will be derived from a level of professional practice expectations. These expectations include a professional demeanor and work ethic (attitude), consistent daily preparation (assignment reading, appropriate materials brought to class, homework completed on time, etc.), commitment to learning and fulfilling obligations (attendance, on time), and being engaged in class activities (participation).

15. Academic Misconduct: Plagiarism of homework and cheating on examinations will be interpreted as academic misconduct and will not be tolerated. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of policies and Procedures for Student Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating, and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies provides no protection from the consequences.

16. Students Rights and Responsibilities. To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html

17. Grade Replacement/Forgiveness. If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by Census Day (See Schedule of Topics). Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler. Also, please notify the instructor so that they know about your circumstances.

18. State-Mandated Course Drop Policy. Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the Census Day (See Schedule of Topics). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions. Please contact the instructor prior to dropping the course to receive any guidance in your course progress.

19. Disability Services. In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079. Additional information may also be obtained at the following UT Tyler Web address: http://www2.uttyler.edu/disabilityservices/

20. Student Absence due to Religious Observance. Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

21. Student Absence for University-Sponsored Events and Activities. If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

22. Social Security and FERPA Statement. It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

23. Emergency Exits and Evacuation. Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. For Tornado warnings the safe areas within the building have been designated. The instructor will identify to you these safe refuge areas. If you require assistance during an evacuation, inform your instructor in the first week of class. Do Not re-enter the building unless given permission by University Police, Fire Department, or Fire Prevention Services, or other official Public Safety personnel.

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is availableathttp://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, waterpipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visitwww.uttyler.edu/tobacco-free.

Important Covid-19 Information for Classrooms and Laboratories

Facemasks are not required, but this rule may be subject to change. Per CDC guidelines, you are strongly encouraged to wear one if you are not vaccinated.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Laptops/PDAs/MP3 players/Cell Phones or other electronic devices

- The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device/calculators. Any instances of a calculator inappropriately used during an exam will be the basis of alleging Academic Misconduct and may result in Failing (F) of the course at the determination of the course's instructor or the basis for a recommendation for expulsion from the University. Any Calculator used during an exam in this course must meet the requirements stated within the policy below.
- **Calculator Policy**

  Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are using a non-approved calculator.

  The approved calculators include the following: (Please check the NCEES website for a complete listing, www.ncees.org/exams/calculator-policy/. Examples include but are not limited to:

  - Hewlett Packard – HP 33s, HP 35s, and no others
  - Casio – All FX 115 models
  - Texas Instruments – All TI 30X or TI-36X models.
  - If you are unsure about your calculator, it is your responsibility to check with the instructor for approval.

  At the discretion of the course instructor, any calculator not meeting the requirements stated (especially in the case of a graphing calculator) may be used but only after an inspection of the device and a clearing of all the memory within the device, performed for the instructor at a time immediately prior to the exam. At any time during the exam your calculator is subject to a random search by the instructor. Failure or refusal to clear all memory or to surrender your calculator to search will disqualify you from the exam immediately, unless you can produce a calculator meeting the requirements as stated above.

Topics Covered and Schedule

SUBJECTS	LESSONS
Basic Concepts	1
Soil Mechanics Review	2
Soil Exploration	3
Bearing Capacity	3
Spread Footing Design	3
Mat Foundation Design	2
Retaining Wall Design	2
Sheet Pile Design	2
Driven Pile Design	2
Drilled Shaft Construction	2
Collapsible/expansive soil	2
Soil Improvement	1
Course Summary	1
Exam Review Days	2
Totals:	**28**

CENG 4381/5381 FOUNDATION DESIGN COURSE SCHEDULE - Fall 2021					
As of 9/30/21 (Subject to revision as needed)					
Lesson#	**Date**	**Topic**	**Reading**		
	Aug 24	Course introduction and syllabus			
1	Aug 26	Introduction to foundation design	1.1 – 1.12		Homework assignments will be given throughout the semester, with due dates clearly defined (typically next class period). Homework handout sheets will be provided during class, as well as posted on the class Blackboard page. Homework solutions will also be posted on the Blackboard page. Be sure to clarify and fix anything you may have been unsure of.
2	Aug 31	Soil mechanics – Stress distribution, settlement, Strain influence factor for elastic settlement	5.1 – 5.12, 1.13 – 1.16		
3	Sep 3	Soil exploration – Laboratory testing, SPT	1.17 – 1.21, 2.1 – 2.19		
	Sep 3	Census Day			
4	Sep 7-9	Soil exploration – CPT, boring logs and lab report	2.20 – 2.29		
5	Sep 14	Ultimate bearing capacity, compression and eccentricity	3.1 – 3.11		
6	Sep 16	Ultimate bearing capacity, eccentricity and special cases	3.11 – 3.12, 4.1 – 4.10		
7	Sep 21	Footing settlement, shallow footing design, Combined footing and mat foundation design	5.15 – 5.20, handouts		
8	Sep 23	Combined footing and mat foundation design/ Exam Review (Cont'd)	6.1 – 6.8; handouts		
10	**Sep 28**	**Mid-Term Exam #1**			
11	Sep 30	Combined Footing/Mat Foundation Design	10.1-10.7 Handouts	9th edition	
12	Oct 5	Structural Reinforcement Design	Handouts	9th edition	
12	Oct 7	Structural Reinforcement Design Cont'd	Handouts		
13	Oct 12	Retaining Wall Design	16.1 – 16.8, 16.11 – 16.13, 17.1 – 17.7	9th Edition	
14	Oct 12	MSE wall design	17.11 – 17.15	9th Edition	
16	Oct 19	Sheet pile design (1)	18.1-18.7	9th Edition	
17	Oct 21	Sheet pile design (2)	18.8 – 18.17	9th Edition	
18	Oct 26	Anchored sheet pile design			
19	Oct 28	Driven pile design (1)	12.1 – 12.9	9th Edition	
	Nov 2	**Last date to withdrawal from course**			
20	Nov 2	Driven pile design (2)			
21	**Nov 4**	**Mid-Term Exam #2**			
22	Nov 9	Drilled shaft design	13.1 – 13.8	9th Edition	
23	Nov 11	Drilled shaft design in clay & rock	13.9 – 13.10, 13.13	9th Edition	
24	Nov 16	Drilled shaft design (Lateral capacity)	13.12	9th Edition	

25	Nov 18	Collapsible/Expansive soil	15.1 – 15.12		
	Nov 22-26	**THANKSGIVING HOLIDAY**			
	Nov 30	Soil Improvement	5.5 - 5.16	9th Edition	
26	Dec 2	Soil improvement	5.5 - 5.16	9th Edition	
27	**Dec. 7 – 11**	***Final Exams week***			

CENG 4381/5381 Course Objectives:

1. Develop a subsurface exploration and lab testing program.

2. Analyze a subsurface profile and determine the most suitable foundation type to support a given structure.

3. Determine the allowable soil bearing pressure for a footing considering shear failure and settlement.

4. Design square and rectangular reinforced concrete footings.

5. Design a reinforced concrete mat foundation.

6. Determine the lateral earth pressure acting on an earth retaining structure.

7. Design a retaining wall.

8. Design a sheet pile structure.

9. Design a driven pile foundation.

10. Design a drilled shaft foundation.

11. Explain commonly used techniques of soil improvement.