

COURSE SYLLABUS – CE 893 UNDERGROUND CONSTRUCTION

FALL 2014

INSTRUCTOR:

Kalyan R. Piratla, PhD
Office: Lowry 310
Office Phone: (864) 656-3324
Mobile: (480) 270-9233
Email: kpiratl@clemson.edu

COURSE HOURS:

T, Th: 02:00-03:15PM, 115 Lowry Hall; you can leave the room if the instructor is late by more than 15 minutes. Students are encouraged to attend all the classes.

OFFICE HOURS:

Tue 3:20-5:00PM, 310 Lowry Hall
Thu 10:50-12:00PM, 310 Lowry Hall
Also available by appointment; Just send me an email giving me times you can meet.

INSTRUCTOR BIO:

Dr. Kalyan Piratla is an assistant professor in the Glenn Department of Civil Engineering in the College of Engineering and Science at Clemson University. He has a bachelors and masters in Civil Engineering from the Indian Institute of Technology (IIT) Madras, India. He got his PhD in Construction Management from Arizona State University. His research interests lie in the area of sustainable and resilient underground infrastructure systems with focus on design and construction aspects.

PRE-REQUISITE COURSES:

CE331 (Construction Engineering and Management)

COURSE OBJECTIVE AND CONTENTS:

The course objective is to learn tools that can be applied to make deteriorating underground pipeline infrastructures more sustainable. Class discussions, outside reading, projects, and homework are designed to support this objective. The following are the list of topics that will be covered in this course:

- Overview of infrastructure systems with focus on underground systems
- Current state of underground systems and potential problems
- Design considerations for buried pipelines
 - o Structural design
 - o Hydraulic design
- Underground construction materials
- Geotechnical investigations for underground construction
- Underground construction methods
- Underground infrastructure inspection methods
- Underground rehabilitation methods

- Planning and management of underground construction projects
- Implications of underground infrastructure failures
- Risk assessment and resilience modeling of infrastructure systems

TEXTBOOKS:

The following text books are recommended as references for this course.

1. Moser, A. P. and Folkman, S. Buried Pipe Design, 3rd Edition, McGraw-Hill, 2008
2. Najafi, M. and Gokhale, S. Trenchless Technology: Pipeline and Utility Design, Construction, and Renewal, 1st Edition, McGraw-Hill, 2004
3. Najafi, M. Trenchless Technology Piping: Installation and Inspection, 1st Edition, McGraw-Hill, 2010

CLASS WEBSITE:

The class website is located at <https://bb.clemson.edu> under kpiratl-Underground. The site will contain class lecture presentations, announcements, and assignments. The student is responsible for checking this site frequently for any latest updates.

WEIGHTING OF GRADES:

Point Papers – 20% (The list of topics and due dates for points papers is attached to this syllabus)

Class Projects and Assignments – 75% (A set of projects and assignments)

- Project-1 (15%)
- Project-2 (10%)
- Project-3 (10%)
- Project-4 (20%)
- Assignments (20%)

Final Test – 5%

GRADING SCALE:

Your final grade will be based on how many points you have received out of the total possible. The grade range indicated below will be followed for this semester. “X” represents your final average out of 100.

Range	Grade
$90 \leq X < 100$	A
$80 \leq X < 90$	B
$70 \leq X < 80$	C
$60 \leq X < 70$	D
$0 \leq X < 59$	F

STUDENT WORK:

You will need an engineering calculator for this course. “Borrowing” from others will not be allowed during exams. The following calculators are accepted in this class: All Casio fx-115 models, HP 33s, HP 35s, TI-30X, and TI-36X models.

ACADEMIC INTEGRITY:

Students are expected to perform class activities in keeping with standards outlined in the Clemson University Statement on Academic Integrity. All the lab submittals must reflect the individual student's efforts. Plagiarism will not be tolerated. Further, students are not allowed to provide or take any assistance during exams. Appropriate action will be taken towards any student suspected of violation of the following statement:

“As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a ‘high seminary of learning.’ Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.”

*“When, in the opinion of a faculty member, there is evidence that a student has committed an act of academic dishonesty, the faculty member **shall** make a formal written charge of academic dishonesty, including a description of the misconduct, to the Associate Dean of Undergraduate Services. At the same time, the faculty member may, but is not required to, inform each involved student privately of the nature of the alleged charge.”*

Please refer to the Academic Integrity Policy on the Clemson University website for additional information: <http://www.clemson.edu/academics/academic-integrity/>

ASSIGNMENT POLICY:

All work will be turned in on time, by the end of period that it is due. A **25% penalty** will be applied once the work is submitted late. The bottom line is that work must be submitted on time and be professional – *just like in industry.*

MAKE-UP POLICY:

Prior notice, when possible, will be given to the instructor when a class will be missed. Only under the most extreme circumstances, supported by written documentation, will a make-up quiz or test be given. The final decision rests with the instructor. When a class is missed, it is the student's responsibility to obtain notes and assignments from fellow classmates.

STUDENT DISABILITY SERVICE:

Students with disabilities who need accommodations should make an appointment with Arlene Stewart, Director of Student Disability Services, to discuss specific needs within the first month of classes. Students should present a Faculty Accommodation Letter from Student Disabilities Services when they meet with instructors. Student Disability Services is located in G-20 Redfern (telephone number: 656-6848; email: sds-1@clemson.edu). Please be aware that accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester.

LIST OF TOPICS FOR POINT PAPERS:

Point Paper #	Topic	Due Date
1	Infrastructure asset management	8/28/2014
2	Subsurface utility engineering	9/30/2014
3	Horizontal directional drilling	10/07/2014
4	Microtunneling	10/21/2014
5	Pilot-tube Microtunneling	10/23/2014
6	Auger boring	10/23/2014
7	Pipeline condition assessment	11/11/2014
8	Pipe bursting	11/20/2014
9	Lining methods	11/20/2014
10	Consequences of buried pipe failure	11/25/2014

-----Good Luck-----