Instructor: Dr. Mohammad Najafi
Office Numbers: 428 Nedderman Hall
Office Telephone Number: 817-272-0507
Email Address: najafi@uta.edu
Office Hours: Friday 5:00 PM-6:00 PM or by appointment

Course Number, Section Number, and Course Title:
CE 5388, Sec 001 (51408) & Sec 101 (54565)
Pipeline Construction and Trenchless Technology

Time and Place of Class Meetings: Fri 1:00-4:50 PM, Room 202 Nedderman Hall

Teaching Assistant (TA): Amir Tabesh
Office Number: Room 243 Nedderman Hall, Learning Center
Office Telephone Number: 817-501-1416
Email: amir.tabesh@mavs.uta.edu
Office Hours: Fridays, 10:00 AM – 1:00 PM (Additional Office Hours by Appointment).

Description of Course Content: Pipeline and utility design, construction and renewal. Topics include pipeline infrastructure structural considerations, planning and construction considerations, pipe materials, and trenchless technologies. Prerequisite: Graduate standing and consent of instructor.

Student Learning Outcomes: The course objective is to prepare students to demonstrate sound engineering judgment for managing the construction, repair, and maintenance of underground pipelines. In addition, this course will focus on the following student abilities and co-educational outcomes.

1. Fundamental Knowledge – Student will develop an understanding of factors affecting the selection of trenchless technology methods for particular renewal, repair, and construction projects.
2. Independent Abilities – Student will discuss and elucidate the difference between the various design and construction methods of underground infrastructure using trenchless technology.
3. Critical Thinking – Student will demonstrate ability to assess, interpret and understand a research topic related to underground pipeline design, construction, renewal, and to minimize surface and subsurface disruptions via paper and class participations.
4. Advanced Knowledge – Student will analyze complex problems to determine/identify applicable design options and potential methods to construct, repair, or renew underground pipelines using trenchless technology.
5. Effective Communication – Student will demonstrate effective communication skills via class discussions, reports, and presentations.
6. Sustainability and Social Issues – Student will explain how advanced technologies and proper planning and preparation will assist in retaining underground infrastructure assets and reduce adverse impacts sudden failures and disruption of these lifeline systems.

All outcomes are observed implicitly through class participation, exams, assignments, reports and formal/informal communications with instructor.

**Required Textbooks and Other Course Materials:**


**Additional References**


**Descriptions of major assignments and examinations with due dates:** See course outline for more details. For participation points, students are encouraged to participate in class discussions and ask questions.

**NOTE:** The assignments are due at the beginning of class. See the Tentative Course Outline. Instructions will be provided in class.

The exams will generally relate to the material covered in lecture or in assignments. The philosophy of the exam is not to merely test your total recall or memorization, but to extend your thinking from theory and example problems to engineering situations.

**Sec 001 (51408) Students:** Need to attend all the classes, take exams and submit all the assignments in class.

**Sec 101 (54565) Students:** The participation points for online students will be added to their midterm and final exams.

Students must attend exams in class if within 50 miles radius of campus. If not, arrangements must be made in advance with the instructor to find an approved proctor preferably to take the exam at the same time with other students.

**Project & Presentation:** Instructions will be provided in class.

**Grading Policy:** Grades will be determined according to the following scale (the grading scale may be lowered at the discretion of the instructor, but will not be raised).

**IMPORTANT NOTE:** Students are encouraged to attend Trenchless Technology and Pipe Conference (TTP 2017), to be held on Tuesday, June 20, and Pipeline Design and Installation Workshop (PDI 2017), to be held
COURSE SYLLABUS
CE 5388—Pipeline Construction and Trenchless Technology

Wednesday through Friday, June 21-23 at Nedderman Hall. See www.cuire.org or contact instructor for more information.

<table>
<thead>
<tr>
<th>Grade</th>
<th>% Required</th>
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<tbody>
<tr>
<td>A</td>
<td>90 -100</td>
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<tr>
<td>B</td>
<td>80-89</td>
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<tr>
<td>C</td>
<td>70-79</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
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<tr>
<td>F</td>
<td>Less than 60</td>
</tr>
</tbody>
</table>

Students will be required to accumulate points from the following:

- Term Project: 25%
- Quizzes/Assignments: 25%
- Midterm Exam: 25%
- Final Exam: 25%
- Total: 100%

Make-up Exam and Assignments Policy: No make-up exams and assignments are given or accepted.

Grade Grievance Policy: It is the obligation of the student, in attempting to resolve any student grievance regarding grades, first to make a serious effort to resolve the matter with the instructor with whom the grievance originated. Individual instructors retain primary responsibility for assigning grades. The instructor's judgment is final unless compelling evidence shows discrimination, preferential treatment or procedural irregularities. If students wish to appeal, their requests must be submitted in writing on an Academic Grievance Form available in departmental or program offices to the department chair or program director. Before considering a grievance, the department chair or program director will refer the issue to a departmental or program committee of graduate faculty. If the committee cannot reach a decision acceptable to the parties involved, the department chair or program director will issue a decision on the grievance. If students are dissatisfied with the chair or director's decision, they may appeal the case to the academic dean. If they are dissatisfied with the academic dean's decision, they may appeal it to the Dean of Graduate Studies. Students have one year from the day grades are posted to initiate a grievance concerning a grade.

For issues involving scholastic dishonesty, see the Academic Dishonesty entry in the UTA undergraduate catalog.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/)

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with
Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit www.uta.edu/eos.

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents’ Rule 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University. Additional information is available at https://www.uta.edu/conduct/.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at http://www.uta.edu/universitycollege/resources/index.php.
Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at [http://www.uta.edu/oit/cs/email/mavmail.php](http://www.uta.edu/oit/cs/email/mavmail.php).

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit [http://www.uta.edu/news/info/campus-carry/](http://www.uta.edu/news/info/campus-carry/).

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit [http://www.uta.edu/sfs](http://www.uta.edu/sfs).

UTA’s E-mail is the prime means for communication. Therefore, the University and the Instructor have the right to send communications to students via e-mail and the right to expect that those communications will be received and read in a timely fashion. The Office of Information Technology (OIT) will assign all students an official University e-mail address. It is to this official address that the University will send e-mail communications. Students are expected to check their official e-mail account on a frequent and consistent basis to stay current with University communications. The University recommends checking e-mail daily; in recognition that certain communications may be time-critical.

A student must give current and correct local and permanent addresses and telephone numbers to the Office of the Registrar and must notify this office immediately of any changes. Official correspondence may be mailed, versus e-mailed, to the appropriate address depending upon the nature of the correspondence and the academic calendar; if the student has moved and failed to correct this address, he or she will not be relieved of responsibility on the grounds that the correspondence was not delivered.

Laptop, I-Pad, and similar equipment and Email classroom not be allowed.

Cellular Phone use in the classroom: In order to minimize distraction, turn off the cell phone or change the setting to ‘vibrate.’ If it is necessary to use it due to an emergency, please leave the classroom quietly and return when done.

Blackboard Site: Handouts, notes, articles, and other information will be posted on Blackboard

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Mohammad Najafi.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. Non-emergency number 817-272-3381.
## COURSE SYLLABUS
### CE 5388—Pipeline Construction and Trenchless Technology

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Learning Objectives</th>
<th>Text References</th>
<th>Quiz</th>
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<tbody>
<tr>
<td>Fri</td>
<td>9-Jun</td>
<td>Background and Introduction – Social Costs of Utility Construction</td>
<td>Overview of Trenchless Technology and Understanding of Social Costs of Utility Construction</td>
<td>Chapters 1 and 2</td>
<td>Quiz 1</td>
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<tr>
<td>Fri</td>
<td>16-Jun</td>
<td>Pipeline Assessment</td>
<td>Water Infrastructure Needs and Challenges, Leveraging Technologies, External Pipeline Inspection Technologies, Internal Pipeline Inspection Technologies, From Inspection to Construction, Example Projects and Programs</td>
<td>Chapter 3</td>
<td>Quiz 2</td>
</tr>
<tr>
<td>Fri</td>
<td>23-Jun</td>
<td>Design Considerations</td>
<td>Pipe Materials</td>
<td>Chapters 4 and 6</td>
<td>Quiz 3</td>
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<tr>
<td>Fri</td>
<td>30-Jun</td>
<td>Pipeline Rehabilitation</td>
<td>New and Replacement Technologies, Renewal and Rehabilitation Technologies, Point Repair Technologies, Repair and Rehabilitation of Appurtenances, Project Examples, Construction Cost Guidelines, Resources List (vendors, contractors, suppliers)</td>
<td>Chapters 13-21</td>
<td>Quiz 4</td>
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<tr>
<td>Fri</td>
<td>7-Jul</td>
<td>Midterm Exam/ Pipe Jacking/Microtunneling/Pilot Tube, Chapters 9, 11, 12</td>
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<td>Fri</td>
<td>14-Jul</td>
<td>Drilling Fluids Horizonal Directional Drilling</td>
<td>HDD Planning and Construction</td>
<td>Chapters 4 and 10</td>
<td>Quiz 5</td>
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<td>Fri</td>
<td>21-Jul</td>
<td>CIPP and Pipe Bursting</td>
<td>Renewal and Replacement Methods Case Studies</td>
<td>Chapters 13 and 16</td>
<td>Quiz 6</td>
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<tr>
<td>Fri</td>
<td>28-Jul</td>
<td>Horizontal Auger Boring and Pipe Ramming</td>
<td>Road Crossing Methods and Overview for Final Exam</td>
<td>Chapter 3</td>
<td>Quiz 7</td>
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<tr>
<td>Fri</td>
<td>4-Aug</td>
<td>Project</td>
<td>Project Presentations</td>
<td>All</td>
<td>Term Project Submission</td>
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<tr>
<td>Tue</td>
<td>15-Aug</td>
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**Final Exam**