

# **COURSE SYLLABUS**

## **CE 5300 TRENCHLESS TECHNOLOGY**

**Instructor:** G. 'Gus' Khankarli, P.E., PMP, and Mohammad Najafi, Ph.D., P.E.

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**Office Hours:** Monday through Thursday 6:00 pm-6:30 pm or by appointment

**Course Number, Section Number, and Course Title:** CE 5300, Sec 001 (50485) & 002 (50006), TRENCHLESS TECHNOLOGY

**Time and Place of Class Meetings:** MTWR 4:00-6:00 pm, Room 111 Nedderman Hall

**Description of Course Content:** This course is designed for engineers and managers involved in underground infrastructure design, construction, renewal, and management to minimize surface disruption. Topics include analysis of direct, indirect, and social costs of underground construction and an overview of available trenchless technology methods with practical examples and applications. Emphasis will be given to project management, type of application, necessary equipment, and methods.

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

1. Fundamental Knowledge – Student will develop an understanding of factors affecting the selection of trenchless technology methods for particular maintenance, 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 design, construction, renewal, and management to minimize surface disruption via a formal paper and presentation.
4. Advanced Knowledge – Student will analyze complex problems to determine/identify applicable design options and potential methods to construct, repair, or rehabilitate underground utilities using trenchless technology.
5. Effective Communication – Student will demonstrate effective oral and graphical communication via class discussions, reports, and presentations.
6. Professional Development – Student will explain how changing technology and the need for retaining underground infrastructure impacts the need for professional life long learning.

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

**Requirements:** Consent of instructor

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### Required Textbooks and Other Course Materials:

Najafi, M. and Gokhale, S. 2005. *Trenchless Technology: Pipeline and Utility Design, Construction and Renewal*. McGraw-Hill, New York.

Handouts, notes, reading assignments, problem solutions and other information will be posted on the class WebCT site.

**Descriptions of major assignments and examinations with due dates:** review of four peer-reviewed articles assignment, integrative paper and a *comprehensive* final exam.

All assignments must be turned in at the start of the class (for Section I students); and for Section II students, submitted electronically through WebCT, prior to the class period in which they are due. Failure to do so will constitute a grade of zero for the assignment in question.

One week of advanced notice will be provided in scheduling the final exam. The final exam will be given according to the university's published final exams schedule. Note that failure to appear for an exam at the scheduled time will constitute a grade of zero in that exam.

Articles review and integrative paper in this class are the minimum assignments considered adequate to achieve basic proficiency of course material. Assignments will be discussed in class.

The final exam 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. If calculations are required, all calculations should show four (4) significant figures for intermediate values calculated. Final answer should be rounded to two (2) significant figures unless all data is greater than three (3) significant figures. Then use minimum number of significant figures dictated by problem (greater than 3). When establishing elevations or distances for design drawing, answers must be in hundreds of a foot or thousands of a meter.

The final exam will be closed book but may include an open book portion.

See the "**Make-up Exam and Assignment Policy**" section for accommodations of incomplete or missed assignments.

**Grading Policy:** Grades are based on a comprehensive final exam, assignments, integrative paper, and attendance/participation through Q&A in class & by email for DL students. Grades will be determined by averaging the exam and assignments as follows. The exam will be weighted at 40%. Review and summary of peer-reviewed articles will be equally weighted at 5% each. Integrative paper will be weighted at 30%. Assignments, class participation, discussions, and attendance will be weighted at 10%. Proper spelling, use of clear and concise sentences on essay questions will also be considered in the grading process. Grade standards are as follows:  $100 \geq A \geq 90$ , Less than  $90 > B \geq 80$ , Less than  $80 > C \geq 70$ , Less than  $70 > D \geq 60$ , and Less than  $60 > F \geq 0$ .

**Attendance Policy:** Students registered for **Section 001 (Class Number: 50485)** are expected to attend all classes. Class participation and discussions are essential for full professional development. **Section 002 (Class Number 50006) – Distance Learning students** can participate in class discussions through daily email communication with the instructor with copy to all students (list will be provided by the Instructor) for proper participation credit.

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**Drop Policy:** Please see university drop policy and deadlines in the Graduate Catalog for official methods and policies. An overall summary drop/withdraw policies of concern are listed below.

Graduate students who wish to change a schedule by dropping a course must first consult with their Graduate Advisor. Regulations pertaining to adding or dropping courses are described below. The last day to drop a course taught in regular semesters is at the end of the 12th week of class. The last day to drop a course in the other, non-traditional semesters corresponds to 75 percent of the duration of the course. The last day to drop a course is listed in the Academic Calendar available.

1. A student dropping a graduate course after the Census Date but on or before the end of the last day to drop a course may with the agreement of the instructor, receive a grade of W but only if passing the course with a C or better average. A grade of W will not be given if the student does not have at least a C average. In such instances, the student will receive a grade of F if he or she withdraws from the class.
2. A student desiring to drop all courses in which he or she is enrolled is reminded that such action constitutes withdrawal (resignation) from the University. The student must indicate intention to withdraw and drop all courses by filing a resignation form in the Office of the Registrar or by Web at [www.uta.edu/registrar](http://www.uta.edu/registrar).
3. In most cases, a student may not drop a graduate course or withdraw (resign) from the University after the last day to drop a course. Under extreme circumstances, the Dean of Graduate Studies may consider a petition to withdraw (resign) from the University after the last day to drop a course, but in no case may a graduate student selectively drop a course after the last day to drop a course and remain enrolled in any other course. Students should use the special Petition to Withdraw for this purpose. See the section titled Withdrawal (Resignation) From the University section of the Graduate Catalog, <http://grad.uta.edu/leftMenuPages/gradcalendar.asp>, for additional information concerning withdrawal.

Students wanting to drop all courses for which they are enrolled must withdraw from the University.

A student who wishes to withdraw (resign) voluntarily from the University before the last day to drop a course deadline must file a resignation form in the Office of the Registrar or file online at [www.uta.edu/registrar](http://www.uta.edu/registrar). After the last day to drop a course deadline, a graduate student or undergraduate student enrolled in a graduate course is not permitted to withdraw or to selectively drop courses. In exceptional cases, however, a graduate student may request to withdraw after the last day to drop a course deadline by obtaining a Petition to Withdraw form and submitting it to the Dean of Graduate Studies. (Students should use the special Petition to Withdraw for this purpose and not the Petition form used for other types of requests.) If the petition is not approved, the student remains responsible for all coursework requirements. Therefore, students should not discontinue class attendance or course assignments unless they have been notified in writing that the Dean of Graduate Studies has approved the petition to withdraw. A Petition to Withdraw form is available online through the Virtual Graduate School Advisor or in the Graduate School office.

**Americans with Disabilities Act:** The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public

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Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled *Americans with Disabilities Act (ADA)*, pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate based on that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability). In addition, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

**Academic Integrity:** All students are expected to pursue their academic careers with honesty and integrity. Academic dishonesty includes, but is not limited to, cheating on a test or other course work, plagiarism (offering the work of another as one's own) and unauthorized collaboration with another person. Students found responsible for dishonesty in their academic pursuits are subject to penalties that may range from disciplinary probation to suspension to expulsion from the University.

In accordance with the Rules and Regulations of the Board of Regents of The University of Texas System (Part One, Chapter VI), institutional procedures regarding allegations of academic dishonesty are outlined in Part Two, Chapter 2, of the UT Arlington Handbook of Operating Procedures. This information may be obtained by accessing the Student Judicial Affairs Web site at [www2.uta.edu/discipline/](http://www2.uta.edu/discipline/) or by obtaining a hard copy of Mav Dates & Data in the Office of Student Development.

**Student Support Services Available:** The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabi. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. Classes are held as scheduled during this week and lectures and presentations may be given.

**Librarian to Contact:** Barbra Howser, Science and Technology Library, NH.

**E-Culture Policy:** The University of Texas at Arlington has adopted the University email address as an official means of communication with students. By email, UT-Arlington is able to provide students with relevant and timely information, designed to facilitate student success. In

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particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through email.

All students are assigned an email account and information about activating and using it is available at [www.uta.edu/email](http://www.uta.edu/email). New students (first semester at UTA) are able to activate their email account 24 hours after registering for courses. There is no additional charge to students for using this account, and it remains active as long as a student is enrolled at UT-Arlington. Students are responsible for checking their email regularly.

**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.

**Make-up Exam and Assignments Policy:** No make-up exams and assignments are given or accepted except for medical or other similar hardships where advanced arrangements are made with the instructor; or in case of non-selective medical emergencies with appropriate physician's note or documentation. Other than circumstances describe above, failure to take the exam or turn in assignments at the scheduled time will constitute a grade of zero in the exam and assignment. It is the student's obligation to contact the instructor, generally before the examination so that appropriate arrangement (if any) may be made.

**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.

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<b>Week</b>	<b>Class</b>	<b>Date</b>		<b>Topic</b>	<b>Description</b>	<b>Articles Review (AR) Due</b>
<b>One</b>		May 27		First Day of Classes		
	1	27	T		Introduction/Chap 1	
	2	28	W		Chap1/Chap 2	
	3	29	TH		Chap 4	
<b>Two</b>		June 2	M	<b>CENSUS DAY</b>		
	4	2	M		Chap 5	<b>AR-1</b>
	5	3	T		Chap 6/Chap 3	
	6	4	W		Chap 7	
	7	5	TH		Chap 8	
<b>Three</b>	8	9	M		Chap 9	<b>AR-2</b>
	9	10	T		Chap 10	
		11	W	<b>MID-SESSION</b>		
	10	11	W		Chap 11	
	11	12	TH		Chap 12	
<b>Four</b>	12	16	M		Chap 13	<b>AR-3</b>
		17	T	<b>LAST DAY TO DROP</b>		
	13	17	T		Chap 14	
	14	18	W		Chap 15	
	15	19	TH		Chap 16	
<b>Five</b>	16	23	M		Chap 17	<b>AR-4</b>
	17	24	T		Chap 18	
	18	25	W		Chap 21	
	19	26	TH		Review	
		26	TH	<b>LAST DAY of CLASSES</b>		
	<b>20</b>	<b>30</b>	<b>M</b>	<b>FINAL EXAM</b>		<b>Integrative Paper Due</b>

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### **General Information:**

**WebCT Site:** Handouts, notes, articles, and other information are located on WebCT

Distance learning students will use the instructor's email to submit class material such as reports, homework, etc to the instructor. This will allow large files to be submitted without any problems. Please insure you keep email receipt as a proof for submission of assignments.

**Articles Review:** Articles will be posted on WebCT and are due by the dates shown on the class schedule. The articles shall be two to three pages long double-spaced with font 12 Arial.

**Exam for Engineering Distance Education:** Distance education students should make every effort to take the scheduled exam on-campus during the regularly scheduled time if the student's work schedule permits.

If this is not possible, a proctor may give the exam within a 24-hour period of the regularly scheduled exam in accordance with the current "**Exam policy for Engineering Distance Education.**" Early arrangement with the Engineering Distance Education office coordinator is encouraged.

**Integrative Paper:** The Integrative paper will be between 7 to 10 pages long double-spaced with font 12 Arial. This paper should include in its bibliography all of the required readings and lectures stated in this syllabus. In other words, you will refer to all of the course readings in the text of the paper. The intent is to demonstrate that you read all of the required material and that you can integrate the readings into a coherent paper. You will want to identify a topic or two that you think encompass the course readings and write your paper around these topics.

Proper spelling, use of clear and concise sentences and structure will be considered in the grading process.

Provide a cover sheet that includes your name, title of the paper, and the date. Your last name must appear in the upper right corner and the page numbers must be centered in the bottom of each page. The research paper shall follow closely the style guidelines as shown in the ASCE Style guide.

**Laptop or Email use in the classroom:** In order to minimize distraction, the use of laptop and Email in the classroom will 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.