

# CE 4337: Portland Cement Concrete Pavements Fall 2016

**Instructor:** Dr. Stefan Romanoschi, P.E.

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**Office Telephone Numbers:** 817-272-0340 / - 9167(lab)

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**Faculty Profile:** <http://www.uta.edu/profiles/stefan-romanoschi>

**Office Hours:** Monday and Wednesday, 1:00 to 3:00 PM in 408NH; or by appointment

**Section Information:** Sections 001 and 002.

**Time and Place of Class Meetings:** M & W 4:00 to 5:20 PM; 234 COBA

**Course Website:** <https://mavspace.uta.edu/sroman/CE5362/> (must type capitals for CE)

**Description of Course Content:** Portland cement concrete mix design and production. Paving operations. Saw and seal operations. Subgrade preparation. Base selection. Drainage selection, design and construction. Bonded and unbonded concrete overlays. Whitetopping and ultra-thin whitetopping. Concrete pavement restoration; quality assurance and quality control in concrete pavement construction. Credit not granted for both CE 4337 and CE 5362. Prerequisite: CE 3261 or equivalent.

**Student Learning Outcomes:** At the end of this course, students will be able to:

## **Student Outcomes Addressed:**

## **Extent of Coverage\***

- |   |                |
|---|----------------|
| (a) An ability to apply knowledge of mathematics, science, and engineering                                      | T <sub>I</sub> |
| (i) A recognition of the need for, and an ability to engage in life-long learning                               | C <sub>I</sub> |
| (j) A knowledge of contemporary issues  | C <sub>I</sub> |
| (k) An ability to use the techniques, skills and modern engineering tools<br>necessary for engineering practice | C <sub>I</sub> |

*\*Covered Implicitly (C<sub>I</sub>): The outcome is implicitly covered*

*Tested Implicitly (T<sub>I</sub>): The outcome is covered and implicitly assessed for by one or more means (assignments, test questions, essay questions, presentation evaluations, lab reports, etc.)*

**Specific Outcomes of Instruction** Students will demonstrate an understanding of engineering properties of constituent materials for Portland cement concrete mixes, design methods for concrete mixes, production and placement of concrete for pavement construction, repair and maintenance methods for concrete pavements

**Required Textbooks:** No text book is required for this class. Handouts will be provided to the students at the beginning of each lecture. However, the following book is recommended:

Norbert Delatte. *Concrete Pavement Design, Construction and Performance*. Taylor and Francis. 2008. ISBN13: 978-0-415-40970-4

**Additional Material:**

1. Notes form NHI Course No. 131033: Construction of PCC Pavements
2. Notes form NHI Course No. 131062: PCCP Evaluation and Rehabilitation
3. Notes form NHI Course No. 131060: Design details for High Performance PCC Pavements.
4. S. Kosmatha, B. Kerkhoff and W. Panarese. Design and Control of Concrete Mixtures, 14<sup>th</sup> Edition. Published by the Portland Cement Association ([www.portcement.org](http://www.portcement.org))

**Major assignments and examinations:** Homework assignments, Term-Paper (deadline: December 5, 2016), Presentation (deadline: December 7, 2014), Mid-Term Exam, and Final Exams. All exams are closed book and closed notes, unless otherwise directed by instructor.

**Attendance Policy:** At the University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I expect all students to attend all classes and to be punctual. Anyone missing class for whatever reason **is responsible for any class notes, assignments or announcements** missed in that class. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

**Other requirements: Prerequisite:** CE 3261 or equivalent

**Grading:** The final grade for this course will be determined on the following basis:

|                                |     |                |
|--------------------------------|-----|----------------|
| Mid-Term Exam.....             | 30% | A : 90% - 100% |
| Comprehensive Final Exam ..... | 35% | B : 80% - 90%  |
| Term -Paper .....              | 25% | C : 70% - 80%  |
| Oral presentation .....        | 10% | D : 60% - 70%  |
|                                |     | F : < 60%      |

**Make-up Exam Policy:** No make-up exams are given 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 described above, failure to take the exam at the scheduled time will constitute a grade of zero in the exam.

**Expectations for Out-of-Class Study:** Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 6(six) hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

**Grade Grievances:** Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University 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://www.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](http://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](http://www.uta.edu/disability).

Counseling and Psychological Services, (CAPS) [www.uta.edu/caps/](http://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 [uta.edu/eos](http://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](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](mailto:jmhood@uta.edu).*

**Academic Integrity:** Students enrolled in this course 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/>.

**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>.

**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/>

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be 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 enters the SFS database anonymously and is aggregated with that of other students

enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

**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 syllabus*. 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. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is the entrance into the GACB Hall. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

**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](mailto:resources@uta.edu), or view the information at [www.uta.edu/resources](http://www.uta.edu/resources).

*The IDEAS Center* (2<sup>nd</sup> Floor of Central Library) offers **free** tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. To schedule an appointment with a peer tutor or mentor email [IDEAS@uta.edu](mailto:IDEAS@uta.edu) or call (817) 272-6593.\

*The English Writing Center* (411LIBR): The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at <http://uta.mywconline.com>. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see [www.uta.edu/owl](http://www.uta.edu/owl) for detailed information on all our programs and services.

*The Library's 2<sup>nd</sup> floor Academic Plaza* offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation.

<http://library.uta.edu/academic-plaza>

**Librarians to Contact:** Sylvia George-Williams and Joshua Been, Science and Engineering Library.

**Course Schedule:**

*August 23, 2016*

| Dates  | Lecture #  | Topic  |
|--|------------|--|
| 8/29   | 1          | Concrete Pavements: History.   |
| 8/31   | 2          | Concrete Pavements: General Concepts   |
| 9/7, 9/12                                    | 3, 4       | Portland cement concrete production. truck mixed concrete and central mixed concrete |
| 9/14, 9/26                                   | 5, 6       | Slip-Form Paving Operation;  |
| 9/19, 9/21                                   |            | NO CLASS   |
| 9/28   | 7          | Fixed-Form Paving Operation;   |
| 10/3   | 8          | Sawing and sealing operations;   |
| 10/5   | 9          | Subgrade preparation; Cement, lime and fly ash stabilized bases;                     |
| 10/10  | 10         | Design of Concrete Mixtures  |
| 10/12  | 11         | Admixtures.  |
| 10/17  | 12         | Mechanical properties and durability of hardened concrete.                           |
| 10/24  |            | <b>MID-TERM EXAM</b>   |
| 10/19, 10/26                                 | 13, 14, 15 | Unbonded and Bonded Concrete Pavement Overlays: Design and Construction.             |
| 10/31, 11/2                                  | 16, 17     | Whitetopping; Ultra-Thin Whitetopping;   |
| 11/7   | 18         | PCPAV  |
| 11/9   | 19, 20     | PCCP for Airports and Streets  |
| 11/14  | 21         | Fast Track   |
| 11/16  | 22, 23     | Concrete pavement rehabilitation;  |
| 11/21  | 24         | Cracking in Concrete Pavements   |
| 11/28  | 25         | Smoothness.  |
| 11/30, 12/5                                  |            | <b>TERM-PAPER PRESENTATIONS</b>  |
| <b>Wednesday, Dec. 14<br/>at 2:00-4:30PM</b> |            | <b>COMPREHENSIVE FINAL EXAM</b>  |

*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. – Stefan A. Romanoschi*