CE 5361: Design and Construction of Asphalt Concrete
Spring 2014

Instructor(s): Stefan Romanoschi, PhD, PE, Associate Professor

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Faculty Profile: https://www.uta.edu/mentis/public/#profile/profile/view/id/2028

Office Hours: Monday and Wednesday, 2:00 to 4:00PM in 408NH; or by appointment

Section Information: Sections 001 and 002

Web: https://mavspace.uta.edu/sroman/CE5361/ (must type capitals for CE)

Time and Place of Class Meetings: Tuesday & Thursday 12:30-2:00PM, 202 Nedderman Hall

Description of Course Content: An in-depth study of the properties of constituent materials for asphalt concrete mixtures. Design methods for Hot-Mixes Asphalt (HMA) and Stone Matrix Asphalt (SMA). Theory and practice of asphalt concrete mix for pavements, including specifications and construction methods for hot-mix asphalt and surface treatments. Maintenance and rehabilitation of flexible pavements. Relationships of material engineering properties to pavement design and performance.

Student Learning Outcomes:

- Ability to apply knowledge of mathematics, science, and engineering
- Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Ability to identify, formulate, and solve engineering problems
- Knowledge of contemporary issues
- Ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Required Textbooks and Other Course Materials:

Textbook:

Hot Mix Asphalt Materials, Mixture Design and Construction, by Roberts F. and al. Second Edition. (1996) Published by National Center for Asphalt Technology. (**ISBN-10:** 0914313010; **ISBN-13:** 978-0914313014)

Additional Material:

The Aggregate Handbook, Richard D. Barksdale, Editor, by the National Stone Association, Washington, D.C., 1991

Hot Mix Asphalt Paving Handbook by NAPA

Descriptions of major assignments and examinations:
Homework assignments, Term-Paper (deadline: April 29, 2014), Presentation (deadline: April 29, 2014), Mid-Term Exam, and Final Exam. All exams are closed book and closed notes, unless otherwise directed by instructor.

Attendance Policy: Class attendance and punctuality are required. Anyone missing class for whatever reason is responsible for any class notes, assignments or announcements missed in that class.

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%), Final Exam (35%), Term–Paper (25%), Oral presentation (10%)

Scale:	*Percentage Points*	*Final Grade*
	90 - 100%	A
	80 - 90%	B
	70 - 80%	C
	60 - 70%	D
	< 60%	F

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.

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.

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 graduate 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/).

Americans with Disabilities Act: The University of Texas at 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)*. 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 that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

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 as they see fit in their courses, including (but not limited to) 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.

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 www.uta.edu/resources.

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.

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. 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 handicapped individuals.

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

Course Schedule: ***January 9, 2014***

Dates	**Topic**
1/21; 1/23; 1/28; 2/4; 2/6; 2/11; 2/13; 2/18; 2/20; 2/25; 2/27	Lectures 01 to 10 Lab Experiments
3/4	**Mid-Term Exam 1**
3/6; 3/18; 3/20; 3/25; 3/27; 4/1; 4/3; 4/8; 4/10; 4/15; 4/17; 4/22; 4/24;	Lectures 11 to 20 Lab Experiments Field visit(s)
4/29; 5/1	Term Paper presentations
May 8 @ 11:00-1:30PM	**Comprehensive Final Exam**

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

Topics Coverered

Asphalt Binders: History. Uses. Refining process.
Asphalt Binders: Physical Testing.
Asphalt Binders: Grading systems. SUPERPAVE Binder Tests and Specifications.
Mineral Aggregates: Production and Sampling.
Mineral Aggregates: Physical tests. Material Selection
Asphalt Concrete Mixes: Marshall Design Method. SUPERPAVE Design Method.
Asphalt Concrete Mixes: Testing and Evaluation
Asphalt Mixes: Production. Placement. Compaction.
Quality Control/ Quality Assurance
Asphalt Pavement Recycling.
Maintenance, Rehabilitation and Reconstruction of Asphalt Pavements
Pavement Smoothness and Skid resistance

Laboratory Demonstrations:

- Aggregates: Specific Gravity. Gradation. Particle Shape. Toughness. Clay Content.
- Asphalt binders: Rotational Viscosity and Dynamic Shear Rheometer.
- Superpave mixture design: gyratory compaction
- Asphalt concrete mixture tests: bulk specific gravity; maximum theoretical specific gravity
- Superpave mixture design: selection of the optimum binder content
- Field visit(s)