**Course Syllabus – Spring 2016**

**CE 5332: Highway Design**

**TTh 12:30-1:50 PM**

**Room: 229 Nedderman Hall**

**Instructor:** Sia Ardekani, PhD, PE

**Office Number:** 434 Nedderman Hall

**Office Telephone Number:** 817-272-3762

**Email Address:** Ardekani@uta.edu

**Faculty Profile:** [**http://www.uta.edu/ce/facultyintro.php?id=2**](http://www.uta.edu/ce/facultyintro.php?id=2)

**Office Hours:** Tu, Wed, Th 9 -11 AM or by appointment

**Section Information:** CE 5332-001 (#31108) & CE 5332-002 (#34027)

**Time and Place of Class Meetings:** TTh 12:30-1:50 PM, Room 229 NH

**TA:** TBD

**TA Office Hours:** TBD (NH 243: The Civil Engineering Learning Center)

**Course Content:** Geometric considerations necessary for the design of city streets, highways, and freeways such as the cross sections, vertical and horizontal alignment, sight distances and stopping distances. Includes the design of maneuver areas, channelization, ramps, intersections, and interchanges.

**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
* Understanding of professional and ethical responsibility
* Ability to communicate effectively
* The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
* Recognition of the need for, and an ability to engage in life-long learning
* Knowledge of contemporary issues
* Ability to use the techniques, skills and modern engineering tools necessary for engineering practice

**Requirements:** Grade of C or better inCE 3302

**Required Textbooks:** A Policy on Geometric Design of Highways and Streets, AASHTO, 6th Edition, 2011 (ISBN:978-1-56051-508-1).

**Major Assignments and Examinations:** Homework assignments, two mid-term exams, one design project, and a comprehensive final exam. All homework assignments must be turned in at the start of the class. Failure to do so will constitute a grade of zero for the homework assignment in question. One week of advanced notice will be provided in scheduling the mid-term exams. 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.

**Attendance Policy:** Attendance is not mandatory; however, no accommodations will be made for incomplete or missed assignments and exams due to absences

**Grading Policy**: Homework (15%), Two Midterm Exams (20% each), Design project (15%), Final Exam (30%).

**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 3 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 physician’s note or documentation. Otherwise, failure to take the exam at the scheduled time will result in a zero grade in the exam.

**Grade Grievance Policy**: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate / 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/ses/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](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

**Title IX:** The University of Texas at Arlington is committed to upholding U.S. Federal Law “Title IX” such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX).

**Academic Integrity:** All 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.*

Instructors 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 Available:** 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](http://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 a 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 located at the end of the hallway to the left of the classroom. 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.

**References:**

1. Geometric Design Projects for Highways, I.C. Schoon, 1999 (Library call# TE145 .S36 2000).

2. Route Surveying & Design, C.F. Meyer & D.W.Gibson, 5th Ed., 1980 (Call# 209 .M48 1980).

3. Fundamentals of Transportation Engineering – A Multimodal Systems Approach, Fricker and Whitford, 1st Edition, 2004.

4. Highway Capacity Manual, National Research Council, Transportation Research Board, 2000 (Call #HE336.H48 H45 2000).

5. Residential Street Design and Traffic Control, W. Hamburger, et al, 1989 (Call# HE335 .R47 1989).

6. Transportation and Land Development, V.G. Stover & F. Koepke, 1988 (Call# HE335 .S76 1988).

7. Highway Engineering, P.H. Wright, 7th Ed. 2004 (Call# TE145 .W74 2004).

8. Freeway and Interchange Geometric Design Handbook, J.P. Leisch & J.M. Mason, Jr., ITE Publication No. TB-017, 2005 (Call# TE176.L45 2005).

**Tentative**

**Date Topic Reading**

 **(PP)**

1/19Highway Financing & Functional Classification 1:1-13

1/21 Vehicle Characteristics 2:1-36

1/26 Design Vehicles 2:1-36

1/28 Road User Characteristics 2:36-46

2/2 Traffic Data for Design 2:46-59

2/4 Highway Capacity & Design Levels of Service 2:60-70 2/9 Stopping Sight Distance 3:1-6

2/11 Decision & Passing Sight Distances 3:6-18

2/16 Horizontal Alinement ‑Considerations 3:18-58

2/18 Horizontal Alinement –Sight Distance 3:106-112

2/23 Horizontal Alinement -Transition Curves 3:59-84

**2/25 Exam #1**

3/1 Horizontal Alinement ‑Layout Ref. 2

3/3 Horizontal Alinement ‑Low Speeds 3:85-106, 9:55-94

3/8 Vertical Alinement – Types of Transition curves 3:149-170

3/10 Vertical Alinement – Minimum Lengths 3:149-170

**3/15&17 Spring Break**

3/22 Vertical Alinement ‑ Layout Ref. 2

**3/24 Assignment and Discussion of Design Projects**

3/29 Vertical Alinement – Grades & Climbing Lanes 3:113-140

3/31 Rdwy Cross‑Section – Slopes & Shoulders 4:1-16

**4/5 Exam #2**

4/7 Rdwy Cross‑Section – Curbs & Drainage 4:16-29

4/12 Roadway Cross-Section – Barriers & Median 4:29-40

4/14 Pavement Types and Design Variable Ref.3, Ch.9

4/19 Grade Separation ‑ Types 10:1-10, 27-62

4/21 Grade Separation ‑ Standards & Ramps 10:63-130 4/26 At‑Grade Intersection‑Channelization 9:94-114

4/28 At‑Grade Intersection‑ADA Requirements Handout

5/3 At‑Grade Intersections‑Sight Distance 9:28-54,186-192

**5/5 Course review, Design Projects Due**

**5/12 (Thursday) Final Exam: 11 AM-1:30 PM**

*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. – S. A. Ardekani*

**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.