

CE 460/560 Special Topics in Traffic Safety (3 Units) Spring 2017 Course Syllabus

Lecture time/location:

Tuesday/Thursday 3:30-4:45

RP Harvill Bldg Room 428

Catalog Description: The following course is intended to introduce topics in traffic safety. Included will be information on how to understand and utilize crash data, safety analysis methods described in the Highway Safety Manual, statistical methods in safety analysis, human factors and crash causality, and an overview of other emerging safety issues and resources.

Objective: Upon completion of the class, students will be able to perform robust safety studies following established methods in the HSM and will have an understanding of the current state of traffic safety in practice.

ABET: The Accreditation Board for Engineering and Technology (ABET) accredits the Civil Engineering curriculum at the University of Arizona. This course fits in the Civil Engineering curriculum, and satisfies ABET outcomes, as defined below and on the “ABET 2010 Criteria Course Classification Form” that is attached.

Primary ABET Outcomes

- C. Ability to design a system, component, or process to meet desired needs
- L. Pass the FE exam as the first step towards professional registration
- M. Be proficient in the major areas of civil engineering

Secondary ABET Outcomes

- A. Apply mathematics, science, and engineering principles
- B. Ability to design and conduct experiments and interpret data
- E. Ability to identify, formulate, and solve engineering problems
- H. The broad education necessary to understand the impact of engineering solutions in a global context
- K. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Instructor Information:

- Dr. Robert Kluger
 - Civil Engineering Building 324J
 - Email: klugerm@email.arizona.edu
 - Open Office Hours: (other times available by appointment)
 - Wednesdays 10 am-12 pm

Textbook:

Required: Hauer, Ezra. The Art of Regression Modeling in Road Safety. Springer. 2015.

Required: AASTHO. Highway Safety Manual. AASHTO. Washington, DC. 2014 (*Available Online through U of Arizona Library, Do Not Buy it!!!*)

References:

Hauer, Ezra. Observational Before-After Studies in Road Safety. Emerald. WA, UK. 1997.

Grading and Assessment:

Total Points - 100

Grading Summary

	Undergraduate Students	Graduate Students
Homework	20 Points	20 Points
Term Paper	30 Points	30 Points
Midterms	50 Points	50 Points

- **Assigned Readings.** Most lectures have suggested readings. These readings will not be directly evaluated, but it will be greatly beneficial to complete reading them on time because they provide important information for you to understand the class contents and participate in class discussions. Questions on the homework/tests may come from the assigned readings.
- **Term Paper.** Each student will select a term paper topic early in the semester. This paper will constitute 30% of each students’ total grade in the course. For information on the Term Paper see “Term Paper Assignment.docx” on D2L.
- **Homework.** There will be 6 homework assignments. Each assignment is scored out of 3 or 4 points totaling 20% of students’ final grades. Points values for each question will be provided in the assignments.
 - Working on homework in groups is permitted. However, each person must turn in a separate write-up and solution prepared by his/her own hand. This means that the problem description, steps taken to solve the problem, and any computer input and output must be written by each person individually.
 - Homework Submission: You are required to turn in your homework via D2L by midnight on the due date. Late submissions will be 1/2 a point off per day totaling up to 50% of the assignment. **Do not wait until the last minute to submit the assignments in case you experience technical difficulties!!**
 - Copying another person’s work without attribution, including copying of any part or the whole of computer files or material from the Internet, is considered plagiarism. It will be prosecuted as a violation of the University of Arizona Student Code of Conduct in accordance with the Code of Academic Integrity. Both codes are published on-line at <http://deanofstudents.arizona.edu/policiesandcodes/>. It is the student’s responsibility to be familiar with these Codes.

- **Exams.** There are two midterm exams. Both exams will be in-class and students may use any resources at their disposal, **but they must complete the exam individually.** Exam questions will be from the contents covered in lectures, assigned readings, assignments, or projects.

Again, cheating will be prosecuted as a violation of the University of Arizona Student Code of Conduct in accordance with the Code of Academic Integrity. Both codes are published on-line at <http://deanofstudents.arizona.edu/policiesandcodes/>. It is the student's responsibility to be familiar with these Codes.

D2L:

The primary source for homework, solutions, design project activities, and other course materials will be D2L. Students may access D2L through <http://d2l.arizona.edu/>. It is the students' responsibility to check this site regularly.

Teaching Philosophy/Tips for Success in Course:

1. Check out **D2L** for updates.
2. **Study time:** The normal after-class study time is 2 hours for a one-credit hour class. You're expected to commit 6 hours (weekly average) outside this 3-credit-hour class.
3. **Class Attendance:** Information lectured in the class cannot always be found in the assigned readings or course slides. Students are responsible for attending class.
4. Please feel free to give your instructor feedback (in person, mail, or email). Any constructive criticism is appreciated to improve future aspects of the class.

Course Policy:

1. Respect your classmates (on time and be quiet).
2. Class Attendance. You are expected to attend all lectures. If you cannot attend a specific lecture, please alert the instructor ahead of time.
 - a. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion,
 - b. Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored.
3. If you have any questions regarding your grade, please let me know **within 7 days** after your grade is returned. Any corrections will not be made after 7 days.
4. In addition to University of Arizona Student Code of Conduct and Code of Academic Integrity mentioned above, please also review Policy on Threatening Behavior by Students (<http://policy.web.arizona.edu/threatening-behavior-students>)

Tentative Schedule: (Schedules and topics are likely to change, watch D2L for updates. Major changes will be announced in class)

Week	Date	Lecture Topic	Assignments	Reference	Readings
1	Jan 12th	TRB - No Class		-	
2	Jan 17th	Syllabus; Need for Safety Analysis; Intro		HSM	HSM Ch1
	Jan 19th	Human Factors	Term Paper Topics Due	HSM	HSM Ch2
3	Jan 24th	Crash Data and Safety of Sites	Homework 1 Assigned	HSM, Hauer	HSM Ch3, Hauer Ch1
	Jan 26th	Distributions and Linear Regression, Terminology		Hauer	Hauer Ch1
4	Jan 31st	Distributions and Linear Regression, Terminology	Homework 1 Due	Hauer	Hauer Ch3, Ch4
	Feb 2nd	Safety Performance Functions - Curve Fitting		Hauer	Hauer Ch3, Ch4
5	Feb 7th	Safety Performance Functions - Curve Fitting	Homework 2 Assigned	Hauer	Hauer Ch3, Ch4
	Feb 9th	Safety Performance Functions - Parametric SPF		Hauer	Hauer Ch5, Ch6
6	Feb 14th	Safety Performance Functions - Parametric SPF		Hauer	Hauer Ch5, Ch6
	Feb 16th	Safety Performance Functions - Goodness of Fit	Homework 2 Due	Hauer	Hauer Ch7
7	Feb 21st	Safety Performance Functions - Goodness of Fit/Model Performance Metrics		Hauer	Hauer Ch7, Ch8
	Feb 23rd	Safety Performance Functions - Model Performance Metrics	Homework 3 Assigned	Hauer	Hauer Ch8
8	Feb 28th	Safety Performance Functions in the HSM		HSM	
	Mar 2nd	Safety Performance Functions in the HSM		HSM	
9	Mar 7th	Safety Performance Functions Wrap Up	Homework 3 Due	Hauer	Hauer Ch9, Ch10
	Mar 9th	Midterm 1		-	-
10	Mar 14th	Spring Break - No Class		-	-
	Mar 16th	Spring Break - No Class		-	-
11	Mar 21st	Network Screening		HSM	
	Mar 23rd	Network Screening	Homework 4 Assigned	HSM	
12	Mar 28th	Network Screening		HSM	
	Mar 30th	Diagnosis	Homework 4 Due	HSM	
13	Apr 4th	Diagnosis		HSM	
	Apr 6th	Diagnosis	Homework 5 Assigned	HSM	
14	Apr 11th	Countermeasure Selection		HSM	
	Apr 13th	Countermeasure Selection	Homework 5 Due	HSM	
15	Apr 18th	Before and After Studies		HSM	
	Apr 20th	Before and After Studies		HSM	
16	Apr 25th	Before and After Studies		HSM	
	Apr 27th	Midterm 2		-	
17	May 2nd	Guest Speaker	Term Paper Due	-	

18	Exam Period	Term Paper Presentations	-	-	
----	----------------	--------------------------	---	---	--