

CE 467 / 567 HIGHWAY SAFETY AND OPERATIONS
Fall 2006 Course Syllabus

Catalog Description:	This course introduces important concepts underlying various aspects of transportation safety. The course addresses several sub-areas of transportation safety. Proactive and reactive safety planning and design, that is tools and methods used to consider design level safety and then “hot-spot” identification and remediation. Human factors considerations in highway safety will also be discussed. Finally, state-of-the-practice analysis methods for evaluating countermeasures will be presented. 3 credit hours of engineering design. Prerequisites: CE 310, CE 363. Graduate-level requirements include a research paper or project.
Course Objectives:	Provide students with a working knowledge of traffic safety concepts, covering the range from traffic planning, operations, and design. Students should gain an understanding of safety management systems, different safety countermeasures, statistical issues with countermeasures and their effectiveness, and crash investigation. Students should be prepared to apply these important safety concepts in professional practice.
Instructor:	Dr. Mark Hickman Civil Engineering Building, Room 214B Phone: 626-9420, E-mail: mhickman@engr.arizona.edu Office hours: Tuesday and Thursday 10 am – 12 noon; other times by appointment.
Class Hours:	Tuesday and Thursday 2:00-3:15 pm, in Mines 225
Textbook:	Electronic Reserves are available through the library, at http://eres.library.arizona.edu/ . A password is required to enter; this will be provided during the first week of class.
Grading:	20% homework, 25% each for 2 in-class exams, and 30% comprehensive final exam A = above 90%; B = 80 to 89%; C = 70 to 79%; D = 60 to 69%; E = below 60%. Graduate student projects are worth 20% of the total grade, with proportional adjustments in the percentages for homework and exams.
Homework:	There will be approximately 7-9 homework assignments; each is worth 20 points toward the total homework grade. Homework that is late will have the following penalties: up to 1 class late: 5 points; up to 2 classes (one week) late: 10 points; more than 2 classes late: no credit. Working on homework in groups of two is permitted. However, each student should submit homework prepared by his/her own hand. This means that the problem description and any steps taken to solve the problem must be generated by each student individually. In the case where computer output is generated jointly (Excel files, other software output, etc.), the group should submit only one solution, with both group members’ names. Copying another person’s work, <i>without attribution, including copying of any part or the whole of computer files or material from the Internet</i> , 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, on-line at http://w3.arizona.edu/~studpubs/policies/cacaint.htm . It is the student’s responsibility to be familiar with these Codes.
Graduate Students:	Graduate students will need to complete an additional project or research paper during the semester. Selection of the project or research topic should be in consultation with the instructor. The following milestones are <i>guidelines</i> for completion of the project: September 22: One-page description of project or research subject to instructor October 20: One-page progress report to instructor November 22: One-page progress report to instructor December 5: Final report due to instructor (last day of class)

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Course Outline:

What is “highway safety”?
Driver behavior and crash “causality”
Elements of highway safety management systems
Safety countermeasures
Safety management process

Exam 1: tentatively September 28

Crash reporting and collision diagrams
Basics of crash statistics
Before-after methods in crash analysis
Advanced statistical methods
Highway geometry and safety

Exam 2: tentatively November 2

Road safety audits
Crash investigation and analysis

Final Exam: Tuesday December 12, 2-4 pm

Useful References

- KW Ogden, Safer Roads: A Guide to Road Safety Engineering, Averbury Technical Press, Ashgate Publishers, 1996.
- Rune Elvik and Truls Vaa, The Handbook of Road Safety Measures, Elsevier, 2004.
- Leonard Evans, Traffic Safety, Science Serving Society, 2004.
- Ezra Hauer, Observational Before-After Studies in Road Safety, Pergamon Press, 1997 (reprinted 2002).
- Simon Washington, Matthew Karlaftis, and Fred Mannering, Statistical and Econometric Methods for Transportation Data Analysis, Chapman & Hall/CRC Press, 2003.
- Institute of Transportation Engineers (ITE), The Traffic Safety Toolbox: A Primer on Traffic Safety, ITE, 1999.
- Federal Highway Administration, Manual of Uniform Traffic Control Devices (MUTCD), 2003 Edition. On line at <http://mutcd.fhwa.dot.gov/>
- American Association of State Highway and Transportation Officials (AASHTO), Roadside Design Guide, 3rd Edition, AASHTO, 2002.
- H. D. Robertson (ed.), Manual of Transportation Engineering Studies, Institute of Transportation Engineers, Prentice Hall, 1994.
- J. Pline (ed.), Transportation Engineering Handbook, 5th Edition, Institute of Transportation Engineers, Prentice Hall, 1999.
- J. Stannard Baker, Traffic Collision Investigation, Northwestern University Center for Public Safety, 2002.
- Lynn B. Fricke, Traffic Accident Reconstruction, Northwestern University Center for Public Safety, 1990.