

Traffic Safety

Instructor

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Class Location and Meeting Times

Class time: Tuesday and Thursday 9:30am – 10:45am
Class location: McClure 415
Instructor's office hours: M, Th, F 11:00 –12:00.
Or you can email me and I will set aside time.

Course Description

Analysis of roadway design alternatives and control strategies with respect to crash probabilities. Statistical models for safety analysis. Crash countermeasure selection and evaluation methodology. Risk management. Additional projects/assignments are required for graduate credit. *Prerequisite: STAT 3010, Co-requisite: ENGR 3600*

Class Materials and Website

The syllabus and schedule might change during the semester. The current version and additional materials are online: <http://www.webpages.uidaho.edu/~mlowry/Teaching/safety.pdf>

Required Textbooks

RSF: *Road Safety Fundamentals*, (2017) Federal Highway Administration. Free online at: <https://rspcb.safety.fhwa.dot.gov/RSF/default.aspx>

HSIP: *Highway Safety Improvement Program Manual*, (2010) Federal Highway Administration. Free online at: <http://safety.fhwa.dot.gov/hsip/resources/fhwasa09029/>

Learning Objectives

Students who complete this course will be able to:

- Identify key points in the history of road safety, including key legislation.
- Explain the two cognitive systems of human behavior and the implications for roadway safety design.
- Understand the challenges and accuracy of safety data.
- Analyze Idaho's crash data with key charts and tables.
- Rank segments and intersections based on safety performance measures.
- Use Safety Performance Functions (SPFs) to predict crash frequency.
- Use Empirical Bayes Method to reduce Regression to the Mean bias.
- Identify potential countermeasures.
- Use Crash Modification Factors (CMFs) to calculate anticipated crash reduction.
- Quantify the safety benefits associated with a countermeasure.
- Conduct benefit/cost analysis to determine if proposed safety projects are economically justified.
- Prioritize countermeasures based Net Present Value and Budget Constrained Optimization.
- Conduct before and after evaluation.

[Part 1 Learning Objectives.pdf](#)

[Part 2 Learning Objectives.pdf](#)

[Part 3 Learning Objectives.pdf](#)

Assignment and Exam Policy

****Using homework, projects, or exams from previous semesters to study for exams, to help complete your assignments, or for any other purpose whatsoever is strictly prohibited. Violators will be failed.****

**** I will not accept late assignments or exam rescheduling without documentation from the Dean of Students or a medical professional. Requests for exam rescheduling must be made prior to the day of the exam.***

****I will not accept extra or alternative work to replace assignments or improve your grade.****

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Schedule

	Date	Topic	Location	Reading	Due	
Fundamentals	Th	15-Jan	Introduction			
	T	20-Jan	Traffic Safety Terminology	FE Review		
	Th	22-Jan	Performance Measures and CMFs	RSF 1 and 2		
	T	27-Jan	History	RSF 3 and 4	HW1: Safety Performance Measures	
	Th	29-Jan	Policy	RSF 5 and 6		
	T	3-Feb	Human Behavior	RSF 7 and 8	HW2: History and Policy	
	Th	5-Feb	The E's of Traffic Safety	RSF 9 and 10		
	T	10-Feb	Exam 1		HW3: Human Behavior	
Crash Data Analysis	Th	12-Feb	Police Reports, Crash Data, and FARS	Lab		
	T	17-Feb	GIS: Introduction	Lab	HW4: Safety Data	
	Th	19-Feb	GIS: Geoprocessing	Lab		
	T	24-Feb	GIS: Identify Site Crashes	Lab	HW5: Mapping Crashes	
	Th	26-Feb	GIS: Use Python Notebooks	Lab		
	T	3-Mar	GIS: Calculate Safety Performance	Lab	Two Python Notebooks	
	Th	5-Mar	CMF Clearinghouse and Roadway Data	Lab		
	T	10-Mar	GIS: System Level Analysis	Lab	HW6: Site Ranking	
Th	12-Mar	Exam 2	Lab	Research Paper (grad students only)		
Safety Management Process	T	17-Mar	<i>No Class, Spring Recess</i>			
	Th	19-Mar	<i>No Class, Spring Recess</i>			
	T	24-Mar	1) Network Screening and Analysis Enhancements		RSF 11	
	Th	26-Mar	Safety Performance Functions (SPFs)		RSF 11	
	T	31-Mar	Empirical Bayes Method		HSIP 1	HW7: SPFs
	Th	2-Apr	2) Diagnosis - GIS: Contributing Circumstances	Lab	HSIP 2	
	T	7-Apr	3) Countermeasure Selection - Safety Benefits	Lab	HSIP 3	HW8: EB Method
	Th	9-Apr	4) Economic Appraisal - Time Value of Money		USDOT BCA	
	T	14-Apr	Excel for NPV, BCR, and 5) Project Prioritization	Lab	HSIP 4	HW9: Diagnosis and Countermeasures
	Th	16-Apr	Programming and Implementation		HSIP 5	
	T	21-Apr	6) Effectiveness Evaluation		HSIP 6	HW10: Economic Appraisal
	Th	23-Apr	Exam 3			Analysis Report (grad students only)
T	28-Apr	Presentations			HW11: Safety Presentation	
Th	30-Apr	Presentations				
T	5-May	Presentations				
Th	7-May	Presentations				

Assignments

[HW1: Performance and Prevention](#)

[HW2: History and Policy](#)

[HW3: Human Behavior](#)

[HW4: Safety Data](#)

[HW5: Mapping Crashes](#)

[HW6: Site Ranking](#)

[HW7: Safety Performance Functions](#)

[HW8: Empirical Bayes Method](#)

[HW9: Diagnosis and Countermeasures](#)

[HW10: Economic Appraisal](#)

[HW11: Safety Presentation](#)

[Data Files.zip](#)

Grading Criteria

Grades are posted in Canvas.

	Percent
Participation in class or my office	1%
HW Assignments	44%
3 Exams	55%
	100%

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Additional Material

	Topic	Item
Fundamentals	FE Exam	*FE Traffic Safety Equations.pdf FE Review Traffic Safety.pdf FE Traffic Safety.mp4 FE Transportation Equations.pdf
	Safety History	History of Road Safety.pdf
Crash Data Analysis	Police Reports and Crash Data	Police Report Activity.pdf Circumstance Event Severity.pdf Idaho Police Report Data Dictionary.pdf Example Idaho Police Report 1996.pdf Example Idaho Police Report 2011.pdf
	GIS: Introduction	GIS Introduction.pdf Moscow GIS Data.zip
	GIS: Geoprocessing	GIS Geoprocessing.pdf ITD ArcGIS Online.pdf
	GIS: Identify Site Crashes	GIS Identify Site Crashes.pdf
	GIS: Use Python Notebooks	GIS Use Python Notebooks.pdf
	GIS: Calculate Safety Performance	GIS Calculate Safety Performance.pdf
	Crash Modification Factors (CMFs)	*CMF Equations.pdf CMF Clearinghouse Activity.pdf
	GIS: System Level Analysis	GIS System Level Analysis.pdf
	Safety Management Process	Safety Performance Functions (SPFs)
Empirical Bayes Method		*EB Equations.pdf Empirical Bayes Activity.pdf
Diagnosis		Diagnosis Activity.pdf
Economic Appraisal and Prioritization		*Appraisal and Prioritization Equations.pdf Appraisal and Prioritization Activity.pdf USDOT Benefit Cost Analysis.pdf

* These documents can be used during the exams.

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Presentation Schedule

The following schedule might change if needed. Students were assigned time slots using a random number between 1 and 5000. Please notify me to request a change in your presentation date. **All students** are required to attend all dates.

Random	Student	Date

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Student Conduct and Policies

Each student is expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.

- **Attendance.** Attendance at all course activities is expected. Missing more than one class period is considered excessive. You are expected to arrive to class on time.
- **Deadlines.** Assignments must be turned in by the due date and time unless prior arrangements have been made. I will not accept late assignments or exam rescheduling without documentation from the Dean of Students or a medical professional. Requests for exam rescheduling must be made prior to the day of the exam.
- **Extra or Alternative Credit.** I will not accept extra or alternative work to replace assignments or improve your grade.
- **Classroom Engagement.** Use of personal phones, music players, tablets, iStuff, etc. is not permitted in class. This includes texting. Please place your ringer on silent before entering class. Reading or working on other materials while in this class is strongly discouraged.
- **Student Conduct:** All students are expected to honor the UI Student Code of Conduct. Violations include, but are not limited to: copying homework assignments completed by others, plagiarism, and cheating. Please be aware that any violation of the UI Student Code of Conduct may result in a course grade of "F".
<http://www.uidaho.edu/DOS/judicialaffairs/studentcodeofconduct>
- **Plagiarism:** Plagiarism occurs when you use but do not cite someone else's work, even if it is re-worded, or by not indicating that a passage (paragraph, sentence, or even a small part of sentence) is directly quoted even if the reference is cited. Following the structure or organization of someone else's work is also plagiarism. Students caught plagiarizing will be given a grade of "F".
- **Cheating.** Using assignments, projects, or exams from previous semesters to study for exams, to help complete your assignments, or for any other purpose whatsoever is strictly prohibited. Violators will be failed.

University of Idaho Classroom Learning Civility Clause

It is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (885-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (885-4285).

Disability Support Services

If you believe that you require disability-related academic adjustments for this class (including pregnancy-related disabilities), please contact Center for Disability Access and Resources (CDAR) to discuss eligibility. A current accommodation letter from CDAR is required before any modifications, above and beyond what is otherwise available for all other students in this class will be provided. Please be advised that disability-related academic adjustments are not retroactive. CDAR is located at the Bruce Pitman Building, Suite 127. Phone is 208-885-6307 and e-mail is cdar@uidaho.edu. For a complete listing of services and current business hours visit <https://www.uidaho.edu/cdar>