



## Course Outline

### 1 BASIC INFORMATION

#### 1.1 COURSE DESCRIPTION

This course has been designed to teach and train senior-level engineering students the needs, policies, methods and procedures required for enhancing road safety measures. The major topics include: Road safety policies; Governmental and local arrangements; Road safety audit; Accident data collection, reporting, database maintenance and data analysis; Identification of hazardous locations (Black Spots); Pedestrian and bi-cycle safety; Road safety manuals; Engineering solutions for road safety enhancement (geometric design, signs & marking, traffic calming devices/measures, traffic signal system, etc); Special cases (bridge approach, rail crossing, business center, etc.); Community awareness and training on road safety; and case study.

#### 1.2 COURSE CONTENTS

1. Course Overview & Introduction
2. Road Safety Statistics: Global/Local Trends/Status
3. Accident/Crash Data: Collection/Reporting, Computer Records/Database Management
4. Factors Involved in Road/Highway Crashes
5. Crash Data Analysis/Crash Estimation Methods
6. Road Safety Audit; Bicycle/Pedestrian Safety
7. Road Safety Management Process: (1) Network Screening; (2) Diagnosis; (3) Selection of Countermeasures; (4) Economic Appraisal; (5) Project Prioritization; (6) Safety Effectiveness Evaluation
8. Road Safety Policy and Strategic Action Plan
9. Community Awareness and Training on Road Safety

#### 1.3 COURSE INFORMATION

1. Senior level undergraduate course
2. Credit hours: 3 hours of classroom contact and 6 hours of self-study per week.
3. Two classes per week having 1.5 hours of duration
4. The course requires fundamental knowledge of probability and statistics

#### 1.4 PREREQUISITE COURSE:

CEE350: Traffic Analysis and Design

#### 1.5 FACULTY

1. Name: Md Shoaib Chowdhury, Ph.D., P.E., F.ASCE; Professor, DCEE, Initial: SbC
2. Room No: SAC 732,
3. Phone: Office Ph: 8852000 ext. 6231
4. E-mail: [shoaib.chowdhury@northsouth.edu](mailto:shoaib.chowdhury@northsouth.edu)
5. Office (Consultation) hours for Fall 2019:  
RT: 03:30 pm – 05:00 pm or by appointment

#### 1.6 CLASS HOURS:

Section 1: RT 09:40 am – 11:10 am (Room # SAC 304)  
Section 2: RT 11:20 am – 12:50 pm (Room # SAC 304)



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## 1.7 TEXT BOOK(S):

1. *Transportation Research Board/AASHTO, "Highway Safety Manual", 1st Edition, 2010,*
2. *Nicholas J. Garber and Lester A. Hoel, "Traffic and Highway Engineering", Cengage Learning, 5th edition, January, 2014*
3. *Roger P. Roess, William R. McShane, and Elena S. Prassas, "Traffic Engineering", Fourth Edition, Prentice Hall, 2011*



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## 2 COURSE OBJECTIVES AND OUTCOMES

### 2.1 COURSE OBJECTIVES:

1. Provide to students a comprehensive understanding of the advanced knowledge on road and traffic safety engineering at a professional level.
2. Prepare students to work in a group to conduct literature review on contemporary research works, study real transportation safety projects, and effectively disseminate the knowledge acquired to a larger audience.

### 2.2 COURSE OUTCOMES (COs):

- 2.2.1 CO1: Comprehend and practice advanced knowledge of road and traffic safety engineering at a professional level.
- 2.2.2 CO2: Investigate into the reasons for accidents for a location/mode, provide engineering solutions and prioritize transport safety projects.
- 2.2.3 CO3: Work in a group to conduct literature review on contemporary research works, study real transportation safety projects, and effectively disseminate the knowledge acquired to a larger audience.

### 2.3 MAPPING OF COURSE OUTCOMES TO BSCEE PROGRAM OUTCOMES

L: Slightly maps (low); M: Moderately maps (medium); H: Substantially maps (high)

	PO - 1	PO - 2	PO - 3	PO - 4	PO - 5	PO - 6	PO - 7	PO - 8	PO - 9	PO - 10	PO - 11	PO - 12	PO - 13
CO1	H												
CO2				M									
CO3									M				

### 2.4 CO DELIVERY AND ASSESSMENT

Course outcomes	Bloom's taxonomy, domain/level (C: Cognitive, P: Psychomotor A: Affective)	Delivery methods and activities	Assessment tools
CO1	C3	Lecture, example, video	Home-work/Assignment, Exam
CO2	C5	Lecture, example, Practice problem	Home-work/Assignment, Exam
CO3	C6	Lecture, group discussions (field visit/Literature review)	Group Assignment/Project (Written report/Oral presentation)

2.4.1 Cognitive domain (knowledge-based): C

1: Knowledge, 2: Comprehension, 3 Application, 4 Analysis, 5: Synthesis, 6: Evaluation



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2.4.2 The affective domain (emotion-based): A

1: Receiving, 2: Responding, 3: Valuing, 4: Organizing, 5: Characterizing

2.4.3 The psychomotor domain (action-based): P

1: Perception, 2: Set, 3: Guided response, 4: Mechanism, 5: Complex overt response, 6: Adaptation,  
7: Origination



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## 3 BSCEE PROGRAM OUTCOMES (PO)

### 3.1.1 PO – 1: Engineering Knowledge

Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex civil engineering problems.

### 3.1.2 PO – 2: Problem analysis

Identify, formulate, research the literature and analyze complex civil engineering problems and reach substantiated conclusions using first principles of mathematics, the natural sciences and the engineering sciences.

### 3.1.3 PO – 3: Design/development of solutions

Design solutions for complex civil engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety as well as cultural, societal and environmental concerns.

### 3.1.4 PO – 4: Investigation

Conduct investigations of complex problems, considering design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

### 3.1.5 PO – 5: Modern tool usage

Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex civil engineering activities with an understanding of the limitations.

### 3.1.6 PO – 6: The engineer and society

Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional civil engineering practice.

### 3.1.7 PO – 7: Environment and sustainability

Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

### 3.1.8 PO – 8: Ethics

Apply ethical principles and commit to professional ethics, responsibilities and the norms of the civil engineering practice.

### 3.1.9 PO – 9: Individual work and teamwork

Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.

### 3.1.10 PO – 10: Communication

Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.

### 3.1.11 PO – 11: Project management and finance

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member or a leader of a team to manage projects in multidisciplinary environments.

### 3.1.12 PO – 12: Life-long learning

Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological change.

### 3.1.13 PO – 13: Contemporary Issues

Demonstrate sound knowledge on global and local contemporary civil engineering issues.



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## 4 COURSE ASSESSMENT

### 4.1 TEACHING/LEARNING STRATEGIES

#### 4.1.1 Lectures

- Attend all classes punctually
- Follow worked examples taught in the class and provided in the textbook
- Solve exercises from the textbook and homework problems
- Discuss/work with group members/peers to solve problems

#### 4.1.2 Private study

- Review lecture materials and study relevant contents from the textbook

### 4.2 ASSESSMENT

- Assignments will be given on closely related lecture topics.
- Midterm exam and final exam will contain questions related the topics covered in class
- Project/group assignment will be given to test students ability in solving real world problems by utilizing the analytical methods/tool/techniques learned in class

### 4.3 EVALUATION:

Distribution of numerical scores		Remarks
Assignment –I	7%	No late assignment will be accepted unless there is a valid (e.g. medical) reason for late submission.
Assignment – II	7%	
Term Paper	14%	Each group must submit a report and deliver a formal presentation;
Project/Road Safety Audit	14%	Each group must submit a project report and deliver a formal presentation;
Midterm Exam	30%	Duration: approximately one hour (closed book)
Final Exam	28%	Duration: approximately one hour (closed book)

### 4.4 GRADING POLICY:

Generally, NSU grading policy will be followed. However, minor deviation is still possible depending on the situation.

### 4.5 EXAM POLICY:

NO MAKE UP for MID-TERM OR FINAL EXAM WILL BE ARRANGED UNLESS AN ABSOLUTELY UNAVOIDABLE VALID REASON FOR ABSENCE IS FOUND. For such unavoidable circumstances, written explanation of the situation must be submitted before the exam. If the mid-term exam cannot be held on the due date, the exam will be automatically shifted to the very next available class, unless otherwise announced.



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## 5 LECTURE SCHEDULE

\* One Day = 1.5 lecture hours, Total 24 days lecture = 36 lecture hours

Day*	Tentative Lecture Topic/ Material Covered	Home Work/Project	
		Assigned	Due
1	Course Overview & Introduction		
2-5	Road Safety Statistics: Global/Local Trends/Status; Accident/Crash Data: Collection/Reporting, Computer Records/Database Management; Factors Involved in Road/Highway Crashes	Assignment # 1 Assignment #2	
6-9	Crash Data Analysis/Crash Estimation Methods; Road Safety Audit; Bicycle/Pedestrian Safety	Project	Assignment # 1 Assignment # 2
10-12	Road Safety Management Process: (1) Network Screening; (2) Diagnosis;	Term Paper	
13	<b>MIDTERM EXAM</b>		
14-17	Road Safety Management Process: (3) Selection of Countermeasures; (4) Economic Appraisal; (5) Project Prioritization;		
18	<b>Project Presentation</b>		Project Report
19-20	Road Safety Management Process: (6) Safety Effectiveness Evaluation		
21	<b>Term Paper Presentation</b>		Term Paper/ Report
22-24	Road Safety Policy and Strategic Action Plan; Community Awareness and Training on Road Safety; Final Exam Review		
<b>Final Exam</b> (As per schedule declared by NSU)			

## 6 CODE OF CONDUCT

Students must comply with the code of conduct as stated in the NSU policies

(<http://www.northsouth.edu/academic/academic-information-and-policies.html>)

- It is highly requested to maintain discipline in the class like not to be late, refrain from making noise during lecture time, not to leave the class early.
- Adopting unfair means in the exams will be considered as a serious crime and the student shall be placed to the university disciplinary committee.
- All materials should be neat and clear, and demonstrate professionalism
- Direct duplication of the work of another is a big offense
- Paraphrasing another person's work with very minor changes keeping the meaning is also plagiarism