MIE1414H Human Factors in Transportation

Instructor

Maurice Masliah

Course Time & Location

Wednesday, 6-9pm
TBD

Email

m.masliah@utoronto.ca

Office Location

TBD

Office Hours

By Appointment Only
5-6 PM Wednesday

Course Overview

The course will cover a wide range of human factors topics related to transportation, in particular motor vehicle transportation. The course provides an understanding of road user characteristics and limitations and how these affect design of traffic control devices and the roadway. The course topics include: history and scope of human factors in transportation; vision and information processing in the context of driving; driver adaptation; driver education, driver licensing and regulation; traffic control devices; crash types, causes, and countermeasures; alcohol, drug, and fatigue effects; forensic human factors.

The course will be taught in the form of lectures followed by relevant case studies involving practical application of knowledge gained. Case studies, and related assigned readings, will involve human factors in relation to crash pattern analysis and countermeasure selection, highway and traffic control design issues, driver regulation policy issues, and forensic investigation. The assignments will include both individual and group assignments. Students will be asked to make presentations on these projects.

Optional Text – Not Required
Much of the course is based upon the following text: Human Factors in Traffic Safety, Third Edition, Edited by Alison Smiley, Lawyers & Judges Publishing Company, Inc. 2016.

Course Schedule – *Subject to Change*

Week	Title	Content
Week 1 – Jan 7, 2021	Introduction	History and scope of human factors in transportation, application to traffic safety
Week 2 – Jan 14, 2021	Vision	Within the context of driving: function of the eye, visual acuity, contrast sensitivity, colour vision, adaptation, perception of closing velocity
Week 3 – Jan 21, 2021	Information Processing	Within the context of driving: attention, information processing capacity, expectancy, mental workload, driver visual search, information processing exercises
Week 4 – Jan 28, 2021		Task Analysis Due (30%)
	Human Nature and Ecological Optics	Marc Green - Guest Lecturer
	Forensic Human Factors	Human factors cases involving visibility, perception of closing speed, driver expectancy, perception-reaction time

Week	Title	Content
Week 5 – Feb 3, 2021	Driver Adaptation	Perceptual cues for speed, adaptation of speed, visual search, attention, adaptation to road safety interventions.
Week 6 – Feb 10, 2021	Intersection Collisions	Driver tasks in intersections, countermeasures to improve detection, visual search, dilemma zone decisions, countermeasures to improve detection
Week 7 – Feb 17, 2021	Winter Reading Week - no classes	
Week 8 – Feb 24, 2021	Road Departure Collisions	Driver behavior in curves, inattention and fatigue, expectancy, overtaking issues, countermeasures: curve design shoulders and clear zone, rumble strips, collision pattern exercise
Week 9 – Mar 3, 2021	Mock Trial Forensics Human Factors	Expert Report Due (25%)
Week 10 – Mar 10, 2021	Bicycle Collisions	Tom Smahel - Guest Lecturer
Week 11 – Mar 17, 2021	Young & Old Drivers	Collision rates, graduated licensing, cognitive functions and aging, older driver adaptation, senior driver assessments
	Fatigue	Long hours, time of day, short sleep, fatigue management programs
Week 12 – Mar 24, 2021	Distraction, Impaired Driving	Sources of distraction, effects on performance, collision rate, impact of alcohol on perception and driving performance
		Expert Rebuttal Report Due (30%)
Week 13 – Mar 31, 2021	Driverless Vehicles	Human factors challenges
Week 14 – Apr 7, 2021	Exam	Exam (15%)

Assignments/Exam Schedule

Week	Subject
Week 4 – Jan 28, 2021	Assignment 1 Task Analysis Due (30%)
Week 8 – Feb 24, 2021	Assignment 2 Group Written Expert Report Due (20%)
Week 9 – Mar 3, 2021	Assignment 2 Mock Trial Presentation Expert & Lawyer (5%)
Week 12 – Mar 24, 2021	Assignment 3 Expert Rebuttal Report Due (30%)
Week 14 – Apr 7, 2021	Exam (15%)