BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Hyderabad Campus

ACADEMIC – GRADUATE STUDIES AND RESEARCH DIVISION
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI-HYDERABAD CAMPUS
SECOND SEMESTER 2021-22
COURSE HANDOUT

Date: 15-01-22

In addition to part I (General Handout for all courses appended to the Time table) this portion gives further specific details regarding the course.

Course No **: CE G573**

Course Title **: Road Safety and Accident Analysis**
Instructor-in-Charge **: Bandhan Bandhu Majumdar**
Instructor(s) **: NA**
Tutorial/Practical Instructors: Bandhan Bandhu Majumdar

1. **Course Description:**

Road safety, accident statistics and investigation, collision and condition diagrams, accident data collection. Reactive and proactive measures of road safety, safe systems approach, blackspot identification and mitigation measures, development of safety performance functions, road safety audit (RSA), identification and treatment of crash locations, economic analysis of road safety measures, Application of intelligent transportation system in road safety management, Accident investigation, Introduction to Road safety manuals including IRC SP 88, PIARC Documents, AUSTROADS Documents, International Road Assessment Program (I-RAP), Network-based safety analysis, Road signs and markings and related codes, Accident Reconstruction

The course provides practical information on how to conduct a road safety audit. One will learn how to improve transportation safety by applying a proactive approach that includes examination of a future or existing road. The course is aimed at learning traffic and road safety engineering and relevant practices for remedial of road crashes. Through this course, students as Safety Engineers will learn how to deal with road safety audit and crash investigation leading to understanding of crash investigation and treatment as well as blackspot investigations. The course is also aimed at learning how to carry out safety studies from the viewpoint of roadway and its environment; vehicles; and human elements.

2. Scope and Objective of the Course: Over past few decades, a sustained increase in the per capita ownership of vehicles, has given rise to several traffic related issues including accidents. Hence, there is a need to find solutions to these problems by understanding the principal components governing them. The present course seeks to develop an understanding of the problems related to traffic safety. Not only that, it also aims at gaining knowledge of the analysis which can help in mitigating the road crashes.

3. Text Book:
T1: Washington S., Karlaftis M., Mannering F., and Anastasopoulos P. **Statistical and Econometric Methods for Transportation Data Analysis**, CRC Press, Third edition.

4. Reference Codes:
R1: Various IRC codes
R2: Training manual for drivers. Transport Department, Govt. of West Bengal and IIT Kharagpur
R3: PIARC (2019) Road Safety Manual

4. Course Plan:

Lecture No.	Topics to be covered	Learning Objectives	Reference to Text Book / Reference Book	SLO*
1-2	Road Safety: An overview	To understand the safe system approach To understand the 4E's of road safety	R1 and R2	a,e
3-4	Pro-active and Re-active approaches of road safety management	To understand and apply pro-active and re-active approaches of road safety	R1	a,e
5-7	Blackspot Identification and management	To identify blackspots and propose remedial measure	R1	a,e
8-12	Accident data collection and investigation	To be able to collect crash data and analyze the data with understanding on Collision diagram, Condition Diagram, Accident data forms IRC 53, Safety Performance Functions and Before-after study	T1	a,b,c,e
13-14	Introduction to Road safety Audit (RSA)	To understand the concept of RSA and its' different stages	R1	a,d,e
15-16	Audit during planning and feasibility stage	To conduct audit during planning and feasibility stage	R1	a,d,e
17-18	Audit during design stage	To conduct audit during design stage	R1	a,d,e
19-20	Audit during construction stage	To conduct audit during construction stage	R1	a,d,e
21-22	Audit during operation and maintenance stage	To conduct audit during operation and maintenance stage	R1	a,d,e
23-25	Auditing Work zone	To conduct audit at work-zones	R1	a,d,e
26	RSA report preparation and result dissemination	To prepare RSA report and result dissemination	R1	a,d,e
27	Legal Issues of Road Safety	To have an idea on the legal aspect of Road Safety particularly with respect to Indian Penal Code	R3	a,e
28-32	IRC SP 88, 2019	To be able to conduct RSA as per Indian standards and able to use various checklists	R1	a,e
33-34	Speed Management	To be able to conduct detailed speed	R2	a,e

		management to reduce crashes		
35-36	Traffic Signs and Pavement Markings	To be able to provide adequate traffic signs and pavement markings as per current Indian standards	R1	a,e
37-38	State of the art Road Safety Practices	To understand the state of the art knowledge on road safety practices across the globe	R2	j
39-40	Road Safety aspects as a driver	To understand various road safety specific activities as a driver	R3	k
41-42	Crash Modification Factor and Economics	To be able to interpret Crash modification Factor and conduct Cost-Benefit analysis for Road Safety Management	R2	a,e

***Student Learning Outcomes (SLOs):**

SLOs are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.

(a) An ability to apply knowledge of mathematics, science and engineering
(b) An ability to design and conduct experiments, as well as to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) An ability to function on multidisciplinary teams
(e) An ability to identify, formulate, and solve engineering problems
(f) An understanding of professional and ethical responsibility
(g) An ability to communicate effectively
(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) A recognition of the need for, and an ability to engage in life-long learning
(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

5. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Mid-Semester Test	90 Min.	25	TBA	CB
Comprehensive	120 Min	35	TBA	CB
Term Project	Continuous	10	Spread over the semester	OB
Research Seminar	Continuous	10	Spread over the semester	OB
Assignments	Continuous	10	Spread over the semester	OB
Road Safety Audit-Field work	Continuous	10	Spread over the semester	OB

6. Chamber Consultation Hour: To be announced during the lecture.

7. Notices: Notices concerning this course will be displayed on Google Classroom.

8. Make-up Policy: Prior permission for all make ups are a must. For medical emergencies, requests have to be forwarded by the Chief Warden to the satisfaction of IC.

9. Note (if any): Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge
Course No. CE G573