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|---|---|
| **INSTITUTE** | **FACULTY OF TECHNOLOGY** |
| **PROGRAM** | **BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)** |
| **SEMESTER** | **6** |
| **COURSE TITLE** | **TRAFFIC ENGINEERING AND ROAD SAFETY** |
| **COURSE CODE** | **01CI0612** |
| **COURSE CREDITS** | **3** |

**Objective:**

1 To understand fundamentals of traffic engineering and road safety
2 To learn different types traffic survey methods and checklists of road safety audit
3 To create basic awareness about level of service for various roadways
4 To explore the fundamentals of traffic control device such as traffic signal, intersection design and road safety audit report preparation.

**Course Outcomes:** After completion of this course, student will be able to:

1 Recognize the basic characteristics of traffic stream at micro and macro level.
2 Apply knowledge of traffic studies and analyze traffic data for practical applications.
3 Design, plan and regulate traffic operation of different roadway facilities and elements.
4 Evaluate causes of road accidents and carry out road safety audits.

**Pre-requisite of course:**Highway Engineering

**Teaching and Examination Scheme**

| Theory Hours | Tutorial Hours | Practical Hours | ESE | IA | CSE | Viva | Term Work |
|---|---|---|---|---|---|---|---|
| 3 | 0 | 0 | 50 | 30 | 20 | 25 | 25 |

| Contents : Unit | Topics | Contact Hours |
|---|---|---|
| 1 | **Traffic Characteristics**<br>Introduction, Human-vehicle-environment system, Characteristics of road users and vehicles, Pedestrian characteristics, vehicular dynamicsforce balance equation, Fundamental traffic flow relationships; Time and space headways and flow patterns, Interrupted and un-interrupted traffic; speed characteristics, Speed characteristics mathematical distributions; Speed and travel time variations, Computation of AADT, Design Hourly Volume from Short- and LongTerm Counts to develop adjustment factors, expanding and adjusting traffic counts in urban area and region, case studies and applications | 10 |

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| Contents : Unit | Topics | Contact Hours |
|---|---|---|
| 2 | **Intersection Traffic Operations and Control**<br>Measurement of traffic flow characteristics at intersections, saturation headway, saturation flow, control delay and operational delay. Traffic signals design - pre-timed fixed control and Automatic traffic control system (Traffic actuated vs Adaptive traffic control), Design of signal setting - phase diagrams, timing diagram – Signal coordination – Area traffic Control System, Rotary Intersection design | 12 |
| 3 | **Traffic Analysis and Management**<br>Capacity and Level of Service concepts, LOS for multilane and freeways | 4 |
| 4 | **Road Safety Diagnosis**<br>Introduction to Road Safety Engineering and Crash Investigation, Human Factors Relating to Crashes/Accidents, Crash/Accident Investigation & Crash Problem Diagnosing, Crash Problems into Solutions & Crash, Investigation Reporting | 6 |
| 5 | **Road Safety Audit**<br>Road Safety Auditing: An Introduction, Concept and need of Road Safety Audit (RSA), Procedures in RSA, design standards, audit tasks, stages of road safety audit, Road Safety Audit Types, audit team and requirements, Checklist, how to use Checklists Road Safety inspection | 10 |
| **Total Hours** | | **42** |

**Textbook :**

1 Transportation Engineering-An Introduction, Khisty C J, Lall B. Kent, Prentice-Hall, NJ, 2005

2 Transport Planning and Traffic Safety: Making Cities, Roads, and Vehicles Safer, Geetam Tiwari and Dinesh Mohan, CRC Press, 2016

**References:**

1 Traffic Engineering and Transport Planning, Traffic Engineering and Transport Planning, Kadiyali, L.R., Khanna Publishers, New Delhi, 2002

2 Highway Engineering, Highway Engineering, A. Veeraragavan, S.K. Khanna and C.E.G. Justo, Nem Chand &Brothers, 2014

**Suggested Theory Distribution:**

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

| Distribution of Theory for course delivery |
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| Remember / Knowledge | Understand | Apply | Analyze | Evaluate | Higher order Thinking / Creative |
|---|---|---|---|---|---|
| 5.00 | 10.00 | 35.00 | 30.00 | 15.00 | 5.00 |

**Instructional Method:**

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
2. Lectures will be taken in class room with the use of multi-media presentations, white board– mix of both
3. Attendance is compulsory in lectures and laboratory which carries a 5% component of the overall evaluation
4. Minimum two internal exams will be conducted and average of two will be considered as a part of 15% overall evaluation
5. Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval. It carries a weightage of 5%
6. Surprise tests/Quizzes will be conducted which carries 5% component of the overall evaluation

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