# SCHEME OF COURSE WORK

**Course Details:**

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| **Course Title** | **: Traffic Engineering and Management** | | |
| **Course Code** | **: 20CE1153** | **L   T PC** | **: 3 0 0 3** |
| **Program:** | **: B. Tech.** | | |
| **Specialization:** | **: Civil Engineering** | | |
| **Semester** | **: V** | | |
| **Prerequisites** | **: None** | | |
| **Courses to which it is a prerequisite** | **: None** | | |

**Course Outcomes (COs):**
At the end of the course, the student will be able to:

| 1 | Discuss the traffic characteristics and analyse the traffic data. |
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| 2 | Describe the factors affecting highway capacity and LOS |
| 3 | Analyse parking data for designing parking facilities |
| 4 | Design effective traffic signal system and discuss the effects of traffic on environment |
| 5 | Explain traffic signs and road markings for highway safety. |

**Program Outcomes (POs):**
Graduates will be able to:

1. Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals to solve complex civil engineering problems.
2. Graduates will attain the capability to identify, formulate and analyse problems related to civil engineering and substantiate the conclusions
3. Graduates will be in a position to design solutions for civil engineering problems and design system components and processes that meet the specified needs with appropriate consideration to public health and safety.
4. Graduates will be able to perform analysis and interpretation of data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions.
5. Graduates will be able to select and apply appropriate techniques from the available resources and modern civil engineering and software tools, and will be able to predict and model complex engineering activities with an understanding of the practical limitations.
6. Graduates will be able to carry out their professional practice in civil engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities.
7. Graduates will be able to understand the impact of the professional engineering solutions on environmental safety and legal issues.
8. Graduates will transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
9. Graduates will be able to function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
10. Graduates will be able to communicate fluently on complex engineering activities with the engineering community and society, and will be able to prepare reports and make presentations effectively.
11. Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.
12. Graduates will engage themselves in independent and life-long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering.

| 9 | Function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams. |
|---|---|
| 10 | Communicate effectively on complex engineering activities with the engineering community and society. |
| 11 | Demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments. |
| 12 | Engage themselves in independent and life – long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering. |

**PSOs:**
1. Collect, process and analyse the data from topographic surveys, remote sensing, hydrogeological investigations, geotechnical explorations, and integrate the data for planning of civil engineering infrastructure.
2. Analyse and design of substructures and superstructures for buildings, bridges, irrigation structures and pavements.
3. Estimate, cost evaluation, execution and management of civil engineering projects.

**Course Outcome versus Program Outcomes & Program specific outcomes:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | | 2 | - | - | 2 | - | - | 2 | - | 2 | 2 | - | 1 | 1 |
| CO2 | 2 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | 3 | 1 | 2 |
| CO3 | 3 | 3 | 2 | 2 | - | 2 | - | - | 2 | - | 2 | 2 | 3 | 1 | 2 |
| CO4 | 2 | 3 | | 2 | - | 2 | - | - | 2 | - | 2 | 2 | 1 | 1 | 1 |
| CO5 | 3 | 3 | 3 | 2 | 3 | 2 | - | 2 | 2 | - | 2 | 2 | 2 | 1 | 1 |

*3 - Strongly correlated, 2 - Moderately correlated, 1 - Low correlation, Blank - No correlation*

| **Assessment Methods:** | Assignment / Seminar / Mid-Test / End Exam |
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## Teaching-Learning and Evaluation

| Week No. | TOPIC / CONTENTS | Course Outcomes | Sample questions | TEACHING-LEARNING STRATEGY | Assessment Method & Schedule |
|---|---|---|---|---|---|
| 1 | Basic characteristics of traffic – volume, speed and density – relationship among traffic parameters. | CO-1 | Explain the characteristics of traffic and their relationship among traffic parameters. | ▫ Lecture<br>▫ Demonstration | Assignment -1 |
| 2 | Traffic volume studies – objectives – types of volume studies. | CO-1 | What are types of volume studies. | ▫ Lecture / Discussion | Mid-Test 1 (Week 9) |

| 3 | Concept of PCU – data collection and presentation – speed studies – types of speeds – objectives of speed studies. | CO-1 | Explain the concept of PCU | ▫ Lecture<br>▫ Discussion | |
| 4 | Methods of conducting speed studies – data collection and presentation – statistical methods for analysis of speed data. | CO-1 | What are the methods that conduct the speed studies. | ▫ Lecture /<br>▫ Discussion | |
| 5 | Definition of capacity – importance of capacity – factors affecting capacity – concept of level of service | CO-2 | What are the factors affecting highway capacity | ▫ Lecture /<br>▫ Discussion | |
| 6 | Different levels of service – conceptof service volume – peak hour factor | CO-2 | What are the differentlevels of service. | ▫ Lecture /<br>▫ Discussion | |
| 7 | Types of parking facilities – on street and off street parking facilities – parking studies. | CO-3 | What are the different types of parking facilities | ▫ Lecture<br>▫ Problem solving | Quiz-1 |
| 8 | Parking inventory study – parking study by patrolling method – analysis of parking data and parking characteristics | CO-3 | Explain the analysis of parking data and characteristics. | ▫ Lecture<br>▫ Problem solving | |
| **9** | **MID TEST – I** | | | ▫ | |
| 10 | – multi storey car parking standards – design standards | CO-4 | What are the standards of multi storey car parking | ▫ Lecture<br>▫ Discussion | Mid-Test 2 (Week 18) |
| 11 | Traffic problems in urban areas – importance of traffic control and regulation – traffic regulatorymeasures | CO-4 | What is the importance of traffic control and regulation? | ▫ Lecture /<br>▫ Discussion | |
| 12 | Channelization – traffic signals – saturation flow - signal design by Webster method – signal phasing and timing diagrams | CO-4 | What is channelization | ▫ Lecture /<br>▫ Discussion | |
| 13 | Detrimental effect of traffic on environment – air pollution –pollutants due to traffic | CO-4 | Explain the detrimentaleffect | ▫ Lecture /<br>▫ Discussion | |
| 14 | Measures to reduce air pollution due to traffic – noise pollution measuresto reduce noise pollution. | CO-5 | What are the measures taken to reduce the noise pollution. | ▫ Lecture /<br>▫ Discussion | |
| 15 | Types of traffic signs – specifications – pavement markings – types – standards and specifications of road markings. | CO-5 | What are the types of road markings. | ▫ Lecture /<br>▫ Discussion | Assignment-2 (Week 15) |
| 16 | Problem of highway safety – types of road accidents – causes – engineering measures. | CO-5 | What are the problems of highway safety | ▫ Lecture /<br>▫ Discussion | Quiz-2 |
| 17 | Educational measures of road accidents – road safety audit – principles of road safety audit. | CO-5 | Explain the educational measures of roadaccidents | ▫ Lecture /<br>▫ Discussion | |
| **18** | **MID TEST – II** | | | ▫ | |
| **19/20** | **END EXAM** | | | ▫ | |