

INSTITUTE	DIPLOMA STUDIES
PROGRAM	DIPLOMA ENGINEERING (CIVIL ENGINEERING)
SEMESTER	3
COURSE TITLE	BASIC TRANSPORTATION ENGINEERING
COURSE CODE	09CI1307
COURSE CREDITS	3

Objective:

- 1 To understand and implements the knowledge of construction and maintenance of the various transportation facilities to meet the current market demands
- 2 To explain the importance of transportation engineering.
- 3 To comprehend the concept of construction and maintenance of the highways.
- 4 To identify the components and defects of railway tracks.
- 5 To understand working and importance of different traffic control devices.

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

- 1 To apply transportation planning concepts for evaluating travel demand and selecting suitable modes of transport.
- 2 To apply highway planning principles for classification, pavement selection, and design of road cross-sections.
- 3 To analyze highway materials and drainage systems for performance and maintenance requirements
- 4 To analyze railway track components and maintenance practices for safe and efficient operation.
- 5 To apply and analyze traffic engineering measures including traffic control devices, road safety, and

Pre-requisite of course: NOT REQUIRED

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	2	30	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction to Transportation Engineering Background and Importance of transportation, Role of Transportation in Nation building, Four-step travel demand modeling process, Modes of Transportation with their advantages and Limitations, Negative impact of transportation on Environment, Recent trends in the field of transportation engineering	8

Contents : Unit	Topics	Contact Hours
2	Road Development and Planning Road classifications, Highway development in India, Highway Planning Objectives, Types of Pavement and Highway cross section Elements with its functions, Planning Surveys and Interpretation, Highway material, Bitumen & its characteristics, function, and tests, Road drainage system: Importance and maintenance	8
3	Basics of Railway Engineering Classification of Indian Railways, Zones of Indian Railway, Permanent way: Ideal requirement, Components; Rail Gauge, types, factors affecting selection of a gauge, Rail Joints – requirements and its types, Creep of rail – causes and prevention, Rail fixtures and fastenings – fish plate, spikes, bolts, keys, bearing plates, Track Maintenance- Necessity, Organization of track maintenance, Duties of permanent way inspector, gang-man and key man	8
4	Traffic Engineering Elements of Traffic Engineering, Traffic Control Devices (TCD)- Types of traffic signs, Road Marking, Traffic signals, road intersections and Islands, Innovative solutions of parking problems in urban area, Road accidents and their remedial measures	4
Total Hours		28

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Experiment 1 Drawing sketches of cross-sectional elements of road and explaining their functions (carriageway, shoulder, camber, etc.)	4
2	Experiment 2 Drawing sketches of road markings as per Indian Roads Congress guidelines	4
3	Experiment 3 Drawing sketches of traffic signs (regulatory, warning, informatory) as per Indian Roads Congress standards	6
4	Experiment 4 Drawing sketches of traffic signals and their phases with standard configurations	4
5	Experiment 5 Sketching various types of road intersections and traffic islands (T, Y, rotary, channelized)	4
6	Experiment 6 Drawing sketches of types of parking (parallel, perpendicular, angled) with standard dimensions	2
7	Experiment 7 Determination of penetration value of bitumen using penetration test apparatus	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
8	Experiment 8 Conducting traffic volume count survey and data analysis for different vehicle categories	2
Total Hours		28

Textbook :

- 1 Highway Engineering, S.K. Khanna and C.E.G. Gusto, Nem Chand Publications, 2020
- 2 Principles of Transportation Engineering, P.C. Verma & S.C. Sharma, Laxmi Publications, 2019

References:

- 1 Traffic Engineering and Transport Planning, Traffic Engineering and Transport Planning, L.S. Srinivasa Murthy, Tata McGraw Hill Education Private Limited, 2014
- 2 Transportation Engineering and Planning, Transportation Engineering and Planning, C.S. Papacostas & P.D. Prevedouros, Prentice Hall India, 2002

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 and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
30.00	30.00	30.00	10.00	0.00	0.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done based on continuous evaluation of students in the laboratory and classroom.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory
- 4 Students will use supplementary resources such as videos, e-courses, Virtual Laboratory

Supplementary Resources:

- 1 <https://ts-nitk.vlabs.ac.in/transportation-engineering/>
- 2 <https://indianrailways.gov.in/>
- 3 <https://www.crridom.gov.in/>
- 4 <https://morth.nic.in/>