



R. K. Institute of Engineering and Technology
Approved by AICTE, New Delhi and Affiliated to SCTE & VT Odisha

CIVIL ENGINEERING

SEMESTER : 3rd

FROM :01/07/2026 TO :05/11/2026

NAME OF THE FACULTY : Er. PRAJNAPARIMITA PAKAL

SUBJECT : TRANSPORTATION ENGINEERING

TOTAL CLASS AVAILABLE IN SEMESTER: 45 nos

NO. OF PERIODS : 03/ WEEK

Class No.	Unit	Topic / Sub-topic	Teaching Method	Learning Outcome
1	I	Introduction to Transportation Engineering, Role of Transportation in National Development	Lecture	Understand importance of transportation
2	I	Modes of Transportation (Road, Rail, Water, Air) – Merits & Demerits	Lecture + Discussion	Compare transportation modes
3	I	Scope, Importance and Characteristics of Roads in India	Lecture	Explain significance of road transport
4	I	General Classification of Roads	Lecture	Classify different types of roads
5	I	Road Alignment – Selection and Factors Affecting Alignment	Lecture + Case Study	Understand principles of road alignment
6	II	Camber – Definition, Purpose, Types (IRC Recommendations)	Lecture + Sketches	Explain camber and its necessity
7	II	Kerbs, Road Margin, Road Formation & Right of Way	Lecture	Identify highway cross-sectional elements
8	II	Design Speed – Factors Affecting Design Speed (IRC)	Lecture	Determine appropriate design speed
9	II	Gradient – Definition, Types and IRC Recommendations	Lecture	Explain highway gradients
10	II	Sight Distance – SSD, Types & Numerical Problems	Lecture + Numerical	Calculate stopping sight distance
11	II	Curves – Necessity, Horizontal & Vertical Curves	Lecture + Drawings	Differentiate highway curves
12	II	Extra Widening – Theory & Numerical Problems	Numerical Practice	Solve extra widening problems
13	II	Super Elevation – Definition, Formula & IRC Limits	Lecture + Numerical	Calculate super elevation



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14	II	Method of Providing Super Elevation, Standard Cross Sections of NH	Lecture + Drawings	Draw standard highway sections
15	II	Revision, Numerical Practice & Unit Test	Practice/Test	Reinforce Unit-II concepts
16	III	Road Materials – Aggregates and Bitumen	Lecture	Identify road construction materials
17	III	Tests on Aggregates – Flakiness, Elongation & Angularity Number	Demonstration	Explain aggregate quality tests
18	III	Tests on Bitumen – Penetration, Ductility, Flash & Fire Point, Softening Point	Demonstration	Explain bitumen quality tests
19	III	Pavement – Definition, Types & Structural Components	Lecture	Understand pavement structure
20	III	Construction of WBM Road	Lecture + Flow Chart	Explain WBM construction
21	III	WBM & WMM Roads – Merits and Demerits	Discussion	Compare WBM and WMM
22	III	Flexible Pavement – Bituminous Road Construction	Lecture	Describe flexible pavement construction
23	III	Bitumen, Emulsion, Cutback, Tar, Prime Coat, Tack Coat & Seal Coat	Lecture	Understand bituminous materials
24	III	Cement Concrete Roads – Construction Methods & Joints	Lecture + Sketches	Explain rigid pavement construction
25	III	Merits & Demerits of Concrete Roads, Revision & Unit Test	Practice/Test	Assess Unit-III
26	IV	Introduction to Railway Engineering, Railway Zones in India	Lecture	Understand Indian Railways
27	IV	Permanent Way – Requirements & Components	Lecture	Explain permanent way
28	IV	Rail Gauge – Types & Factors Affecting Selection	Lecture	Classify rail gauges
29	IV	Rails, Rail Joints – Types & Requirements	Lecture	Identify rails and joints
30	IV	Creep of Rails – Causes & Prevention	Lecture	Explain rail creep
31	IV	Sleepers – Functions, Requirements & Types	Lecture	Compare sleeper types
32	IV	Ballast – Functions, Types & Suitability	Lecture	Explain ballast functions



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33	IV	Rail Fixtures & Fastenings – Fish Plates, Bolts, Spikes, Chairs, Anchors	Lecture + Samples	Identify rail fittings
34	IV	Revision & Unit Test	Practice/Test	Reinforce Unit-IV
35	V	Railway Alignment & Standard Track Cross Sections	Lecture + Drawings	Explain track alignment
36	V	Railway Geometrics – Gradient, Curves, Grade Compensation	Lecture	Understand railway geometry
37	V	Super Elevation, Cant Deficiency, Negative Cant, Coning & Tilting of Rail	Lecture + Numerical	Explain cant and related concepts
38	V	Branching of Tracks – Points, Crossings & Turnouts	Lecture + Sketches	Identify track components
39	V	Track Junctions – Crossovers, Scissor Crossover, Diamond Crossing & Track Triangle	Lecture	Explain track junctions
40	V	Railway Stations – Purpose, Requirements, Types & Site Selection	Lecture	Classify railway stations
41	V	Station Yards – Passenger, Goods, Locomotive & Marshalling Yards	Lecture	Explain station yard functions
42	V	Track Maintenance – Necessity, Classification & Organisation	Lecture	Understand maintenance systems
43	V	Maintenance Tools, Duties of PWI, Gangmate & Keyman	Demonstration	Identify maintenance tools and responsibilities
44	V	Comprehensive Revision & Numerical/Objective Practice	Practice	Strengthen overall understanding
45	V	Final Revision, Doubt Clearing & Internal Assessment	Discussion/Test	Complete course assessment

Parash
27.06.26

Sign of Faculty

Rajit
27.06.26
R.K. Institute of Engg & Tech.
Kantapada, Nallaballuta

Sachin
27.06.26
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