

5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Introduction and Road Geometric	1a. Discuss various Modes of transportation 1b. Explain the various components of a road section. 1c. Demonstrate the basic requirement of road alignment. 1d. Describe various terms used in road geometry.	1.1 Importance & Classification of roads 1.2 Modes of transportation. 1.3 Requirements of good roads 1.4 and its advantage. 1.5 Road alignment and their types 1.6 Importance of road alignment. 1.7 Factors affecting the alignment. 1.8 Cross section of road showing its component as per IRC. 1.9 Function of each component. Terms used in road geometry Camber, sight distance, Super elevation, Widening of Road. 1.10 Transition curve and Road Gradient.
Unit – II Road materials and its construction aspects	2a. Describe various types of road construction methods. 2b. Explain various types of failures and maintenance of road. 2c. Explain various types of tests on road materials.	2.1 Types of Pavement. 2.2 Necessity of Soil Stabilization and its methods. 2.3 Types of materials used in road Construction 2.4 Various tests on Aggregate and bitumen. 2.5 Construction of Flexible and Rigid Pavement. 2.6 Types of Failures in roads 2.7 Maintenance of roads and its components
Unit – III Drainage system.	3a. Explain importance of drainage and its maintenance	3.1 Importance of drainage. 3.2 Purpose of drainage. 3.3 Methods of Surface and Sub-surface drainage. 3.4 Maintenance of drainage system.

Unit – IV Introduction to Permanent way.	4a. Describe the basic parts of railway track and its functions. 4b. Explain the Joints and Gauge. 4c. Explain basic knowledge of points and Crossing.	4.1. Typical cross section of various permanent way as per IRS. 4.2. Function of Various Components. 4.3. Method of fixing the rails with slipper. 4.4. Function of Rail joints. 4.5. Railway gauge , Types of Rail gauge and uniformity of gauge. 4.6. Function of point and crossing. 4.7. Factors affecting point and crossing. 4.8. Components of Turn outs and types of crossing.
Unit – V Yards and Maintenance of railway track	5a. Discuss the function of various yards. 5b. Explain requirement of track Maintenance	5.1 Classification of Yards. 5.2 Function of Various Yards. 5.3 Requirement of Track Maintenance. 5.4 Daily and periodical Maintenance. 5.5 Maintenance of Alignment, Drainage, Track Material and its components, Point and crossing and level crossing.

Unit – VI Introduction, Investigation and Maintenance of Bridges.	6a. Discuss the function of various parts of bridge. 6b. Explain terms related to bridge. 6c. Explain requirement of an ideal bridge 6d. Carry out the maintenance report	6.1. Importance and term used in Bridge. 6.2. Component of Bridge and its function 6.3. Requirement of an ideal bridge 6.4. Classification and types of bridge. 6.5. Bridge Site Characteristics 6.6. Factor affecting the selection of Bridge Site. 6.7. Explain following terms: Scour, Afflux, Runoff, Economic Span, Clearance, Freeboard. 6.8. Classification of Cause Way and its limitations. 6.9. Routine and in depth inspection. 6.10. Requirements of Inspection Report. 6.11. Maintenance of Steel Bridge, Masonry Bridge, Cause Way, Piers, Pilebents, Abutment, Wing Wall, Road Surface, Drainage, Parapet Wall and Bearing.
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6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction and Road Geometric	8	2	3	5	10
II	Road materials and its construction aspects	9	4	4	7	15
III	Drainage system	4	2	3	5	10
IV	Introduction to Permanent way.	8	2	3	5	10
V	Yards and Maintenance of railway track	5	2	3	5	10
VI	Introduction, Investigation and Maintenance of Bridge.	8	2	5	8	15
Total		42	14	21	35	70

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.