SPINTRONIC TECHNOLOGY AND ADVANCE RESEARCH, BBSR

LESSON PLAN

Name of the Faculty: Mrs.S.P.Rath	
Branch: Civil Engineering (Diploma)	Semester: 5th Semester
Subject: PAVEMENT DESIGN & MAINTENANCE	Theory / Sessional: Theory

Academic Session:	Subject Code:	Total Periods:	Subject Name:
2026–27	CEPE 301A	45	Pavement Design & Maintenance

Sl. No.	Module	Lecture Topics	Period(s)	Cumulative Period(s)	Remark
1.	Module–I: Basics of Pavement Design (8 Periods)	Types of Pavement – Flexible, Rigid and Semi Rigid	1	1	
2.		Comparison of Rigid and Flexible Pavement	1	2	
3.		Life Maintenance, Initial Cost, Stages of Construction	1	3	
4.		Availability of Materials and Surface Characteristics	1	4	
5.		Penetration of Water, Utility Location, Glare and Night Visibility	1	5	
6.		Functions and Characteristics of Pavement	1	6	
7.		Factors Affecting Selection of Type of Pavement	1	7	
8.		Assignment + Doubt Clearing + Surprise Test (Module–I)	1	8	
9.	Module–II: Fundamentals of Pavement Design (7 Periods)	Factors Affecting Pavement Design – Design Wheel Load	1	9	
10		Traffic Factors	1	10	
11		Environmental Factors	1	11	
12		Road Geometry and Materials	1	12	
13		Characteristics of Soil	1	13	
14		Drainage Situation	1	14	
15		Assignment + Doubt Clearing + Surprise Test (Module–II)	1	15	
16	Module–III: Design of Flexible and Concrete Pavement (10 Periods)	Overview – Methods of Flexible Pavement Design (Theoretical)	1	16	
17		Empirical Method with Soil Strength Test	1	17	
18		Empirical Method without Soil Strength Test	1	18	
19		IRC:37 Guidelines for Design of Flexible Pavement (Overview)	1	19	
20		Factors Affecting Design of Concrete Pavement	1	20	
21		IRC:58 Guidelines for Design of Concrete Pavement (Overview)	1	21	
22		Joints – Need, Types, Requirements and Spacing of Joints	1	22	
23		Design of Rigid Pavement (Thickness Calculation)	1	23	
24		Design of Concrete Pavement – Mix Proportion & Details	1	24	
25		Assignment + Doubt Clearing + Surprise Test (Module–III)	1	25	
26	Module–IV: Pavement Evaluation (10 Periods)	Definition and Purpose of Pavement Evaluation	1	26	
27		Methods of Pavement Evaluation	1	27	
28		Visual Rating	1	28	
29		Pavement Serviceability Index	1	29	
30		Roughness Measurement	1	30	
31		Benkelman Beam Deflection Method	1	31	
32		Effect of Pavement Condition on Performance	1	32	
33		Collection and Interpretation of Field Data	1	33	
34		Performance Prediction and Reporting	1	34	
35		Assignment + Doubt Clearing + Surprise Test (Module–IV)	1	35	
36	Module–V: Pavement Maintenance (10 Periods)	Types of Pavement Maintenance – Routine, Periodic and Special	1	36	
37		Need for Inspection and Maintenance Schedule	1	37	
38		Causes of Pavement Failure and Remedial Measures	1	38	
39		Typical Flexible and Rigid Pavement Failures and Causes	1	39	
40		Distresses in Flexible Pavement – Cracks, Ravelling, Rutting, Fatigue	1	40	
41		Settlement and Upheaval	1	41	
42		Disintegration – Loss of Aggregate, Stripping, Potholes	1	42	
43		Remedial Measures – Slurry Seal, Fog Seal, Patching	1	43	
44		Repair Methods – Patching, Joint Sealant Failure, Full Depth Reconstruction	1	44	
45		Assignment + Doubt Clearing + Surprise Test (Module–V)	1	45	

REFERENCES

1. Kadiyali, L. R., Highway Engineering, Khanna Book Publishing House, New Delhi.
2. Chakroborty, Partha Das & Animesh, Principles of Transportation Engineering, Prentice Hall of India Pvt. Ltd.
3. Vazirani, V. N., Chandola, S. P., Transportation Engineering Vol. I & II, Khanna Publishers, Delhi.
4. Yoder, E. J., Principles of Pavement Design, Wiley India Pvt. Ltd.
5. Bindra, S. P., Highway Engineering, Dhanpat Rai Publications (P) Ltd.
6. Kumar, R. S., Pavement Evaluation and Maintenance Management System, Universities Press (India) Pvt. Ltd.
7. Sharma, S. K., Principles, Practice and Design of Highway Engineering, S. Chand, New Delhi.