ATME COLLEGE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

Lesson Plan for the Session Feb - May 2024-2025 (Even Sem)

Faculty Name: B h a r a t h i B
Subject with code: Design and Construction of Highway Pavements-BCV613D
Semester with section:6th Sem

Module No	Class.	Topics proposed to be covered	% portion covered	Remarks
1		Overview of highway - Classification of roads	20	
		Pavement Layers – Components and Functions		
		Highway alignment and Survey		
		road development in India, Components and Geometric Standards of Highway Design		
		Soils, Soil Characteristic Evaluation, desirable properties		
		Tests (Virtual) - Liquid Limit, Plastic limit, Shrinkage Limit,		
		Grain size analysis - Wet sieve and Hydrometer analysis, Water Content, Specific gravity,		
		swell index, Relative density, Heavy compaction, California Bearing Ratio.		
2		Desirable properties, tests (Virtual) - Sieve analysis, Specific gravity, Water absorption, Bulk density, Wet Sieve analysis	40	
		Aggregate crushing value, Aggregate impact value, Combined Flakiness and Elongation index, Aggregate abrasion value, Soundness of aggregate, Characteristic evaluation		
		Desirable properties, tests (Virtual) - Specific gravity, Penetration, Softening Point, Ductility, Elastic recovery, Flash point, Separation		
		Loss on heating, Matter soluble in trichloro ethylene, Absolute, Kinematic and Rotational Viscosity, Aging of Bitumen, Characteristic evaluation.		
		Desirable properties, tests (Virtual) - Consistency, Initial Setting Time, Final Setting Time, Mortar Cube compressive strength,		
		Fineness of cement, Specific gravity of cement, Soundness of cement, Characteristic evaluation		
		Desirable properties, requirements, tests (Virtual) - Workability, Compressive Strength,		
		Flexural strength, Characteristic evaluation		
3		Introduction, composition, factors governing design	60	
		design of flexible pavements as per IRC		
		Bituminous mix design (Marshall method),		
		IIT Pave Software; Case study - Design Problem		
		Introduction, composition, factors governing design		
		DLC and PQC mix design		
		design of concrete pavements as per IRC		
		Joints; Case study – Design Problem		
4		Introduction; Asphalt Hot Mix Plant, oncrete Batching Plant,	80	
		Wet Mix Macadam Plant,		
		Earthmoving and Excavation Equipment, Paving Equipment,		

		Slipform Paver, Paver Milling and Road Marking Equipment		
		Factors affecting output of Plant & Equipment; Initiatives to improve quality		
		Concept of Highways, Planning; Schedules in Planning		
		Monitoring; Software in Planning		
5		Construction Practices and Quality Control	100	
		Granular Sub-base, Construction Activities; Cement Treated Sub-base Construction Activities		
		Wet Mix Macadam; Construction Practices of Wet Mix Macadam; Hot Mix Asphalt		
		Construction Practices of Hot Mix Asphalt Layer, Quality Control of Flexible Layers		
		Dry Lean Concrete; Construction Practices of Dry Lean Concrete; Pavement Quality		
		Construction Practices of Pavement Quality Concrete, Quality Control of Rigid Layers		
		troduction, Pavement Condition Survey, Pavement Evaluation Functional and Structural, Distresses		
		Flexible and Rigid Pavement, Overlay Design of Flexible Pavement.		

Suggested Learning Resources

Books

1. Khanna, S.K., Justo, C.E.G and Veeraragavan, A, 'Highway Engineering', Revised 10th Edition,Nem Chand & Bros, 2017
2. Partha Chakraborty, “Principles of Transportation Engineering”, PHI Learning,
3. Principles and Practices of Highway Engineering by Kadiyali L.R and Dr.Lal N.B., Khanna Publishers, New Delhi, 2003
4. Relevant IRC and IS Codes of Practices, MoRTH Specification

Web links and Video Lectures (e-Resources):

NPTEL and YouTube Videos.