

Course No.	CE 214005
Course Title	Pavement Materials and Construction Practices
Credits	L T P Cr 3 0 0 3
Prerequisites	-

Pavement Materials:

Subgrade functions, Importance of subgrade soil properties on pavement performance. Identification and significance of soil characteristics, Soil classification, Effect of water on swelling and shrinkage, Cohesion and Plasticity. Road making aggregates – Classification,

Properties of aggregates, design of aggregate gradation, texture, polishing and skid resistance. Bituminous road binders – Straight- run bitumen, emulsions, Cutback and modified binders. Rheology of bituminous binders, modified binders – adhesion and stripping, penetration index, viscosity, temperature susceptibility of viscosity. Additives and their suitability, Fillers.

Design of Bituminous mixes – Marshall method and super paves procedure. Design of emulsified mixes, Visco-elastic and fatigue properties of bituminous mixtures, resilient modulus of pavement materials. Requirements of paving concrete, design of mixes – IRC, absolute volume, Road Note No.4, Vibrated Concrete mix design, design of DLC and SFRC mixes, Soil stabilization techniques.

Pavement Construction Practices:

Embankment Construction: Formation cutting in Soil and hard rock, Preparation of Subgrade, Ground improvement, Retaining and Breast walls on hill roads, Granular and Stabilized, Sub – bases / bases, Water Bound Macadam (WBM), Wet Mix Macadam (WMM), Cement treated bases, Dry Lean Concrete (DLC).

Bituminous Constructions: Types of Bituminous Constructions, Interface Treatments, Bituminous Surfacing and wearing Courses for roads and bridge deck slabs, Selection of wearing Course under different Climatic and Traffic conditions, IRC specifications, Construction techniques and Quality Control.

Concrete road construction: Test on Concrete mixes, Construction equipments, Method of construction of joints in concrete pavements, Quality Control in Construction of Concrete pavements, Construction of Continuously reinforced, Prestressed, Steel Fibre Reinforced (SFRC) Pavements, IRC, MORT&H, ACI Specifications, AASHTO Specifications, Recycled pavements, Non – Conventional Pavements, Overlay Construction.

Reference / Text Books

1. Yoder and Witezak, Principles of Pavement Design, John Wiley and sons, 1975.
2. Yang, Design of functional pavements, McGraw-Hill, 1973.
3. Kett I, Asphalt Materials & Mix Design Manual, Noyes Publications, 1999.
4. Prithvi Singh Kandhal, Bituminous Road Construction in India, PHI Learning Pvt. Ltd., Delhi, 2016.
5. P. Purushothama Raj, Ground Improvement Techniques, Laxmi Publications (P) Ltd., New Delhi, 2005.
6. MoRTH, Specifications for Road and Bridge Works, Fifth Revision, IRC, New Delhi, 2013.
7. Relevant IRC codes and Ministry Specifications.

Any other Remarks: