

GUJARAT TECHNOLOGY UNIVERSITY

M.Tech.(Civil)Transportation System Engineering

Syllabus

3 : HIGHWAY MATERIALS & TESTING

Course Objective:

To provide detailed knowledge about characteristics, testing, and standard specification of various types of highway materials keeping in view the serviceability requirements of highways pavements.

Course Contents :

Introduction – Highway Materials, Aggregates, Binders, Additives and their Suitability. Aggregates – Physical and Strength Characteristics. Grading Requirements and Proportioning, Texture, Polishing and Skid Resistant. Bituminous Binders – Classification, Characteristics and Applications, Road Tars, Fluxing of Binders. Theological Characteristics – Adhesion and Stripping Penetration Index, Viscosity, Temperature Susceptibility of Viscosity, Modified Binders, Fillers and Theory, Specification. Bituminous Mixes – Design of Bituminous Mixes and Methods of Testing, Marshal, Hubbard, Hveem and Triaxial Method. Concrete Paving Mixes – Mix Design Methods, IRC, Absolute Volume, Road Note No. 4, Vibrated Concrete Mix design, Design of DLC and SFRC Mixes.

Pre-requisite : Nil

Reference Books :

1. Kerbs and Walkes, Highway Materials, McGraw Hill Book Co., 1971
2. ASTM Highway Testing Manuals – EI Centre
3. Relevant IS, IRC, ASTM Codes.

Practical

1. Terminology of non-bituminous materials, bitumen and bitumen-aggregate.
2. Highway stone aggregate testing.
3. Highway bitumen material testing.
4. Theological characteristics of adhesion and stripping.
5. Bituminous paving mixes and marshall mix design.
6. Modified binders and quality control requirements of it.
7. IRC concrete mix design.
8. Concrete mix design using road note no. 4 method.
9. Design of SFRC mixes.
10. Seminar.