

# GUJARAT TECHNOLOGY UNIVERSITY

M.Tech.(Civil)Transportation System Engineering

Syllabus

## Major elective 3 : PAVEMENT ANALYSIS AND DESIGN

Course Objectives :

To make the students fully conversant with the latest methods of analysis and design of flexible and rigid pavements along with their strengthening techniques.

Course Contents :

Importance and functions of various component of pavement structures, Stresses in flexible pavements, Analytical techniques, Multilayered solutions, Design concepts, Sub grade stresses and deflection, Shear failures, equivalent single wheel and axle loads, vehicle Damage factor, Loading characteristics, Static, Impact and repeated loads, Effects of dual and tandem axles. Tyre pressure and total load, Equivalent stress and equivalent deflection criterion, Wheel load, Climatic and environmental factors. Structural and functional distress in pavements, Design of flexible pavements, CBR method, Triaxial method, Mcleod method, Analytical methods, Multilayer elastic theory and design, Design for low cost pavements. Rigid pavements, Equivalent wheel load, Stresses, Sub grade theories, Westergaard's analysis , Methods of design for dense liquid, Elastic solid sub grades, Temperature stresses and their evaluation, CRC Pavements Prestressed concrete slabs, Tie bars, Dowel bars, SFRC pavements, Pavement flexible and rigid overlay, IRC method of design.

Pre-requisite : Nil

Reference Books :

1. E.J. Yoder, Principles of Pavement Design, 2<sup>nd</sup> Edition, 1975 John Wiley & Sons, Inc. New York.
2. Khanna & Justo, Highway Engineering – Nem Chand & Brothers, Roorkee, 1997
3. Kadiyali L. R. Principles & Practice of Highway Engg. Khanna Pub. 2000.
4. Chakroborty P., Das A, Principles of Transportation Engg., PH1, 2005