

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE467	HIGHWAY PAVEMENT DESIGN	3-0-0-3	2016
Pre-requisite : CE208 Geo Technical Engineering - I			
Course Objectives: <ul style="list-style-type: none"> To introduce highway pavements, design concepts and material properties, To understand and enable students to carry out design of bituminous mixes, analyse and design flexible and rigid highway pavements To introduce the concepts of pavement evaluation and rehabilitation. 			
Syllabus : Introduction to highway pavements – Subgrade soil properties – Design of bituminous mixes- Analysis of flexible pavements- Design of flexible pavements- Analysis of rigid pavements- Design of rigid pavements-Pavement evaluation- Introduction to design of pavement overlays.			
Course Outcome: The students will be able to <ol style="list-style-type: none"> identify the pavement components and design bituminous mixes, analyze and design flexible and rigid pavements evaluate structural condition of pavement. 			
Text Books: <ol style="list-style-type: none"> Yoder and Witezak, Principles of Pavement design, John Wiley and sons, second edition,1975. Yang, Design of functional pavements, McGraw- Hill,1972. Khanna S. K. & Justo C. E. G., Highway Engineering, Nemchand & Bros, 9e. Hass & Hudson, ‘Pavement Management System’, McGraw Hill Book Co, 1978. 			
References: <ol style="list-style-type: none"> IRC: 37 - 2001, ‘Guidelines for the Design of Flexible Pavements’. IRC: 58 – 2002, ‘Guidelines for the Design of Rigid Pavements’. IRC: 37-2012, ‘Tentative Guidelines for the Design of Flexible Pavements’. IRC: 58-2011, Guidelines for Design of Plain Jointed Rigid Pavements for Highways. 			
Module	Contents	Hours	Sem. Exam Marks %
I	Introduction to highway pavements, Types and component parts of pavements, Factors affecting design and performance of pavements, Functions and significance of sub grade properties, Various methods of assessment of sub grade soil strength for pavement design Mix design procedures in mechanical stabilization of soils,	6	15

	Design of bituminous mixes by Marshall, Hubbard - field and Hveem's methods		
II	Introduction to analysis and design of flexible pavements, Stresses and deflections in homogeneous masses, Burmister's 2 layer and 3 layer theories, Wheel load stresses, ESWL of multiple wheels, Repeated loads and EWL factors	6	15
FIRST INTERNAL EXAMINATION			
III	Empirical, semi - empirical and theoretical approaches for flexible pavement design, Group index, CBR, Triaxial, Mcleod and Burmister layered system methods	7	15
IV	Introduction to analysis and design of rigid pavements, Types of stresses and causes, Factors influencing stresses, General conditions in rigid pavement analysis, Warping stresses, Frictional stresses, Combined stresses	7	15
SECOND INTERNAL EXAMINATION			
V	Joints in cement concrete pavements, Joint spacings, Design of slab thickness, Design and detailing of longitudinal, contraction and expansion joints, IRC methods of Design	8	20
VI	Introduction to pavement evaluation, Structural and functional requirements of flexible and rigid pavements, Quality control tests for highway pavements, Evaluation of pavement structural condition by Benkelman beam, rebound deflection and plate load tests, Introduction to design of pavement overlays and the use of geosynthetics	8	20
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN (End semester examination)

Maximum Marks :100

Exam Duration: 3 Hrs

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

Note : 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a, b ,c, d)