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NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CIVIL ENGINEERING

M.Tech. (Transportation Engineering and Management)

COURSE PLAN – CE603 PAVEMENT MATERIALS AND DESIGN

Semester: I

COURSE OUTLINE TEMPLATE			
Course Title	PAVEMENT MATERIALS AND DESIGN		
Course Code	CE603	**No. of Credits**	4
Department	Civil Engineering	**Faculty**	Dr. V. Sunitha
Pre-requisites Course Code	Nil		
Course Coordinator(s) (if, applicable)	NA		
Other Course Teacher(s)/Tutor(s) E-mail	Nil	**Telephone No.**	0431 2503165 (O) 9443302930 (M)
Course Type	Core course		

COURSE OVERVIEW

The course give overall view of the materials used in pavement construction and also teaches the design of pavements.

COURSE OBJECTIVES

- To learn the characteristics, properties and testing procedures of highway materials
- To study the behaviour of pavements under various loads
- To design the flexible and rigid pavements using different Empirical, semi-empirical and theoretical approaches

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
Upon completion of this course, the students should be able to:	
• understand the properties and the various test for the highway materials and perform Bituminous Mix design	a b c d e h
• analyze the stresses, strains and deflections in rigid and flexible pavements	a b c d e h
• design both rigid and flexible pavements	a b c d e g h

COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	**Week**	**Topic**	**Mode of Delivery**
1	Week 1	Introduction, Material Characterization - Subgrade soil	Chalk and Board PPT
2	Week 2	Material Characterization – Aggregate, Bitumen	PPT
3	Week 3	Comparision between Flexible & Rigid Pavement Factors affecting design of pavement	PPT
4	Week 4	Performance based binder	PPT
5	Week 5	Superpave Mix design	PPT
6	Week 6	Stress in Flexible Pavements (Layer system Concept) One layer System	Chalk and Board
7	Week 7	Two layer system	Chalk and Board
8	Week 8	Three layer system First Assessment test	Chalk and Board
9	Week 9	Stress in Rigid Pavement Stress due to wheel load (Westergaard's and Influence Chart Method) warping stresses	Chalk and Board
10	Week 10	Stresses due to friction, Dowel bar design	Chalk and Board
11	Week 11	Joints in CC pavemnt	Chalk and Board
12	Week 12	Class test Equivalent Single Wheel Load	Chalk and Board
13	Week 13	Equivalent Wheel Load factor Pavement Design (CBR, Burmister, Triaxial)	Chalk and Board
14	Week 14	Second Assessment Test	
15	Week 15	Pavement Design (McLeod, IRC 37)	Chalk and Board
16	Week 16	IRC 58, IITPAVE, KENPAVE, drainage	Chalk and Board Software Demonstration PPT
17	Week 17	AASHTO Methods, Mechanistic – Empirical design, Airport pavement design	PPT, Chalk and Board

COURSE ASSESSMENT METHODS				
S.No.	**Mode of Assessment**	**Week/Date**	**Duration**	**% Weightage**
1	Test 1	8th Week/19.09.16	1 ½ hours	20
2	Test 2	14th Week/31.10.16	1 ½ hours	20
3	Assignment	Tutorial	--	5
4	Seminar	16th Week	1 hour	5
5	End Semester	18th Week/05.12.16	3 hours	50

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

1. Yoder and Witczak, *Priniciples of Pavement Design*, John Wiley and Sons
2. Yang. H. Huang, *Pavement Analysis and Design*, Second Edition; Prentice Hall Inc.
3. Rajib B. Mallick and Tahar El-Korchi, *Pavement Engineering – Principles and Practice*, CRC Press (Taylor and Francis Group)
4. W.Ronald Hudson, Ralph Haas and Zeniswki , *Modern Pavement Management*, Mc Graw Hill and Co
5. IRC 37: 2012 Tentative Guidelines for the Design of flexible Pavements
6. IRC 58: 2015 Guidelines for the Design of Plain Jointed Rigid Pavements for Highways

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

The Feedback form will be collected from the students in 17th week.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

100 % attendance is desirable, with a minimum of 75 %.
The grading of marks is as given in M.Tech. NITT regulations.

ADDITIONAL COURSE INFORMATION

The Course Coordinator is available for consultation during working hours.
Queries may also be emailed to the Course Coordinator directly at sunitha@nitt.edu

FOR SENATE'S CONSIDERATION

Course Faculty _____ **CC-Chairperson** _____ **HOD** _____