 NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY	NBA Accredited * NACC Accredited with “A” grade (An ISO 9001 – 2008 Certified Institution) Affiliated to Visvesvaraya Technological University (VTU) Recognized by Govt. of Karnataka & Approved by A.I.C.T.E. New Delhi
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Course No.: 17CVT733	Dept.:Civil
Course Title: Pavement Design	Semester:7 th
Instructor-in-charge :	Academic Year: 2020-21
Lab. Instructor :	

Subject Description:

This Course covers the Concepts of pavement components in flexible and rigid pavements. Ability to identify, design, formulate the stresses and deflections in flexible and rigid pavements.

Textbooks:


- 1.S K Khanna, C E G Justo, and A Veeraragavan, “Highway Engineering”, Nem Chand & Brothers
2. L.R.Kadiyali and Dr.N.B.Lal, “ Principles and Practices of Highway Engineering”, Khanna publishers.
3. Yang H. Huang, “Pavement Analysis and Design”, University of Kentucky.

Reference Books:

- 1.Yoder & wit zorac, “Principles of pavement design”, John Wiley & Sons.
2. SubhaRao, “Principles of Pavement Design”.
3. R Srinivasa Kumar, “Pavement Design”, University Press.

PREREQUISITES

1. Transportation Engineering 2. Principles and Practices of Highway Engineering 3. Relevant recent IRC codes <i>A good understanding of the above topics is essential</i>	Self study/ Online/ Outsourced	Referral Document 1. L.R.Kadiyali and Dr.N.B.Lal, “ Principles and Practices of Highway Engineering. 2. R Srinivasa Kumar, “Pavement Design 3. http://civildigital.com/pavement-design-road-construction-design-parameters/ 4. http://civildigital.com/pavement-design-examples/	Remarks
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LECTURE PLAN

Topic	Topic Details	Number of Lectures	Cumulative lecture hrs.	Unit/ Chapter Reference
Overview	Introduction	1	1	
Unit 1 Introduction	Introduction, Desirable characteristics of pavement, types and components	1	2	
	Difference between Highway pavement and Air field pavement –	1	3	
	Factors affecting design and performance of pavements	1	4	
	Design strategies of variables in pavements	1	5	
	comparison between Rigid and flexible pavement.	1	6	
Revision		1	7	
Unit 2 Fundamentals of design of pavements	Introduction to Design life – Traffic factors – climatic factors – Road geometry	1	8	
	Subgrade strength and drainage, Stresses and deflections	1	9	
	Boussinesqs theory – principle, Assumptions – Limitations and problems on above	1	10	
	Busmister theory – Two layered analysis – Assumptions	1	11	
	Numerical	1	12	
	Numerical	1	13	
Revision		1	14	
Assignment	AAT 1-QUIZ	1	15	
Unit 3 Design of flexible pavements	Introduction to flexible pavements, Empirical methods of Group index method, Plate load	1	16	


*CV, ME, ECE & ISE departments were accredited by NBA for 3 years



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	test,			
	CBR method – Testing as per IRC, AASHTO,	1	17	
	CRV method –Design of pavement by Equivalent C-Value and R-Value method,	1	18	
	Triaxial test– Kansas method, McLeod’s method	1	19	
	Burmisters layered system concepts	1	20	
	Numerical	1	21	
	Numerical	1	22	
Revision		1	23	
Unit 4 Stresses in rigid pavement	Introduction to Rigid pavements Principle – Factors - wheel load and its repetition – properties of sub grade – properties of concrete.	1	24	
	External conditions – joints – Reinforcement –Analysis of stresses – Assumptions	1	25	
	Westergaard’s Analysis – Modified Westergaard equations	1	26	
	Critical stresses – Wheel load stresses, Warping stress – Frictional stress – combined stresses (using chart / equations)	1	27	
	Numerical	1	28	
	Numerical	1	29	
Revision		1	30	
Assignment	Assignment for AAT 2	1	31	
Unit 5 Design of rigid pavement	Design of C.C. Pavement by IRC: 38 – 2002 for dual and Tandem axle load	1	32	
	Reinforcement in slabs – Requirements of joints –	1	33	

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	Types of joints –Expansion joint – contraction joint			
	warping joint – construction joint – longitudinal joint, Design of joints	1	34	
	Design of Dowel bars, Design of Tie bars	1	35	
	Numerical	1	36	
	Numerical	1	37	
Revision		1	38	
Future scope of learning	Design and evaluate the flexible and rigid pavements.	1	39	

Evaluation Scheme:

Component	Duration	Weightage	Date (Time)
CIE 1	90 min	20%	29-09-2020
CIE 2	90 min	20%	07-11-2020
AIT 1	2 days	5%	24-09-2020
AIT 2	2 days	5%	04-11-2020
Make up CIE	90 min	20%	26-11-2020
SEE	180 min	50%	11-12-2020
Make up SEE	180 min	50%	08-01-2020
Total		100%	

Ramyashree M
Course-in-charge