 <p>NAGARJUNA COLLEGE OF ENGINEERING & TECHNOLOGY</p>	<p>NBA Accredited *</p> <p>NACC Accredited with “A” grade (An ISO 9001 – 2008 Certified Institution)</p> <p>Affiliated to Visvesvaraya Technological University (VTU)</p> <p>Recognized by Govt. of Karnataka & Approved by A.I.C.T.E. New Delhi</p>
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COURSE HANDOUT

Course No. : 18CVI51	Dept.: Civil Engineering
Course Title : TRANSPORTATION ENGINEERING (IC)	Semester: 5th
Instructor-in-charge : Mr.Mandeep B V	Academic Year: 2020-21
Lab. Instructor :	

Subject Description

This Course includes the basics of transportation engineering & role of engineers in planning, designing and managing the transport system and infrastructure. You will be exposed to various aspects of the transport system such as planning and design.

Text Books:

T1: S.K. Khanna, Dr. C.E.G Justo, Dr. A. Veeraragavan: “Highway Engineering”, (Chapters 1-4, 6, 7, 11, 14), Revised 10th Edition, Nem chand and Bros, Roorkee, 2014, ISBN: 9788185240725.

T2: Dr. L.R. Kadiyali, Dr. N.B. Lal, “Principles of Highway Engineering”, (Chapters 1, 2,6, 16, 18, 19, 20, 22), Khanna Publishers, New Delhi -6, ISBN: 97881740916595.

T3: Transportation Engineering, K P Subramaniam, ISBN:978-8174092205 2nd edition, 2011, Scitech Publications, Chennai

Reference Books:


R1: IRC Codes – IRC:37-2001, IRC:58-2002.

R2: C. Jotin Khisty, B. Kent Lal, “Transportation Engineering”, PHI Learning Pvt. Ltd., New Delhi.

R3: E.J. Yoder, M.W. Witzak, “Road materials & Pavement Design”, Wiley India Pvt Ltd; 2nd edition (2011)

PREREQUISITES


<p>1. Civil Engineering Foundation.</p> <p>2. Basics of Transportation</p> <p><i>A good understanding of the above topics is essential</i></p>	<p>Self study/ Online/ Outsourced</p>	<p>Referral Document</p> <ol style="list-style-type: none"> http://nptel.ac.in/courses/105104098/45 https://www.youtube.com/watch?v=qbO7ZMfCDWI S.K. Khanna, Dr. C.E.G Justo, Dr. A. Veeraragavan: “Highway Engineering”, 	<p>Remarks</p>
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LECTURE PLAN


Topic	Topic Details	Number of Lectures	Cumulative lecture hrs.	Unit/ Chapter Reference
Overview	Introduction, types, committees, Planning Surveys.	1	1	
Module 1 Principles of Transportation and Highway Development and Planning	Importance of transportation, Different modes of transportation	1	2	T1: Page No. 01-10 & 16-44 T2: Page No. 3-10, & 25-40,
	Comparison of different modes and Characteristics of road transport	1	3	
	Jayakar committee recommendations and implementation	1	4	
	Central Road Fund, Indian Roads Congress.	1	5	
	Road types and classification, road patterns,	1	6	
	planning surveys, master plan – saturation system of road planning, phasing road development in India,	2	8	
	Problems on saturation system and phasing of roads.	1	9	
	Present scenario of road development in India (NHDP and PMGSY) and in Karnataka (KSHIP and KRDC), Road development plan - vision 2021.	1	10	
Revision	Brief discussion about entire module with important questions.	1	11	
Module – II Highway Alignment and Surveys, Highway Geometric Design-I	Ideal Alignment, Factors affecting the alignment	1	12	T1: Page No. 49-68&72-89 T2: Page No.100-129
	Engineering surveys- Map study, Reconnaissance, Preliminary	1	13	
	Final location and detailed survey, Reports and drawings for new and re-aligned projects	2	15	

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	Importance of geometric design, Terrain classification.	1	16	
	Design speed, Factors affecting geometric design.	1	17	
	Cross sectional elements; Camber- width of pavement-Shoulders.	2	19	
	Width of formation- Right of way, Typical cross-sections.	1	20	
Revision	Brief discussion about entire module with important questions.	1	21	
Assignment	Referring Journal Papers.			
Module – III Highway Geometric Design-II	Sight Distance-Restrictions to sight distance	1	22	T1: Page No. 89-119,124-133 & 149-160 T2: Page No.130-142
	Stopping sight distance and problems on SSD	2	24	
	overtaking sight distance- overtaking zones	1	25	
	Problems on OSD	1	26	
	Sight distance at intersections, Horizontal alignment	1	27	
	Radius of Curve- Super elevation Examples	2	29	
	Vertical alignment, summit and valley curves	1	30	
	Problems on Vertical curves.	1	31	
Revision	Brief discussion about entire module with important questions.	1	32	
Module – IV Pavement Materials and Design Sub grade soil	Desirable properties - HRB soil classification	1	33	T1: Page No. 309-369, 398-404, 428-444 & 461-469 T2: Page No.223-247,443-464,364,522-527
	determination of CBR and modulus of sub grade reaction	1	34	
	Examples on CBR	1	35	
	Aggregates- Desirable properties and list of tests	1	36	
	Bituminous materials- Explanation on	1	37	

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	Tar, bitumen, List of tests on bituminous materials.			
	Pavement types, component parts of flexible and rigid pavements and their functions	1	38	
	Rigid pavement- Westergaard’s equations for load and temperature stresses - Examples.	2	40	
Revision	Brief discussion about entire module with important questions.	1	41	
Assignment	Online Quiz			
Module – V Highway Drainage and Highway Economics	Significance and requirements of highway drainage	1	42	T1: Page No. 690-703 & 744-752 T2: Page No.288,301,316,737- 740
	Surface drainage system and design.	1	43	
	Examples on surface drainage	1	44	
	sub surface drainage system.	1	45	
	Highway user benefits, Economic analysis	1	46	
	annual cost method- Benefit Cost Ratio method NPV-IRR method, Examples.	2	48	
Revision	Brief discussion about entire module with important questions.	1	49	
Future scope of learning	Pavement design and construction. Pavement performance evaluation and maintenance.	1	50	

Evaluation Scheme:

Component	Duration	Weightage	Date (Time)
CIE 1	60 min	10%	28/Sep/2020
CIE 2	60 min	10%	06/Nov /2020
AAT 1	2 days	2.5%	25/Sep/2020
AAT 2	2 days	2.5%	02/Nov /2020
Make up CIE	60 min	10%	25/Nov /2020
Lab + Practical + Record		25%	28/Nov /2020
SEE	180 min	50%	11/Dec/2020
Make up SEE		50%	08/Jan/2021
Total		100%	

Mr.Mandeep B V
Course-in-charge

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