SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF CIVIL ENGINEERIG

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20CE5T01	Transportation Engineering	V	CIVIL	6	2024-25	03-06-2024

COURSE OUTCOMES
Students are able to

1	Plan a highway network for a given area.[K2]
2	Determine highway alignment and design all highway geometrics. [K3]
3	Illustrate intersections and prepare traffic management plans.[K2]
4	Judge the suitability of pavement materials.[K2]
5	Design flexible and rigid pavements and their maintenance measures.[K3]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
		Unit–I : HIGHWAY PLANNING AND ALIGNMENT				
1	Plan a highway network for a given area.[K2]	1.1	Different modes of transportation-Highway development in India-Classification of roads.	T2,R1	1	Chalk & Talk, Active Learning
		1.2	Road network patterns-Necessity of highway planning	T2,R1	1	
		1.3	Different road development plans-First, second and third road development plans.	T2,R1	1	
		1.4	Road development vision-2021- New transport policy-2025.	T2,R1	1	
		1.5	Highway alignment-Factors affecting alignment.	T2,R1	1	
		1.6	Engineering surveys conducted to finalize alignment.	T1, T2, R1	1	
		1.7	Drawings and reports.	T1, R1	1	
				Total	**07**	
		UNIT II. HIGHWAY GEOMETRIC DESIGN				
2	Determine highway alignment and design all highway	2.1	Importance of geometric design-Design controls and criteria.	T1,R1	1	
		2.2	Highway cross section elements-sight distance elements.	T1,R1	1	
		2.3	Stopping sight distance-derivation derivation.	T1,R1	1	
		2.4	Problems on SSD	T1,R1	2	

	geometrics. [K3]	2.5	Overtaking sight distance-derivation.	T1,R1	1	Chalk & Talk, Active Learning
		2.6	Problems on OSD and ISD	T1,R1	3	
		2.7	Design of horizontal alignment-Super elevation-Derivation.	T1,R1	1	
		2.8	Problems on super elevation.	T1,R1	3	
		2.9	Extra widening on curves-problems.	T1,R1	1	
		2.10	Design of transition curves. Length of curve.	T1,R1	1	
		2.11	Length of curve problems.	T1,R1	3	
		2.12	Design of vertical alignment-Gradients.	T1,R1	1	
		2.13	Vertical curves-types.	T1,R1	1	
				Total	**20**	
		UNIT III. TRAFFIC ENGINEERING				
3	Illustrate intersections and prepare traffic management plans.[K2]	3.1	Parameters of Traffic-Volume, Speed and Density	T1,R1	01	Chalk & Talk, Active Learning
		3.2	Traffic Volume Studies	T1,R1	01	
		3.3	Speed studies, spot speed studies	T1,R1	01	
		3.4	Parking Studies	T1,R1	01	
		3.5	Road Accidents, Causes and Preventive measures	T1,R1	01	
		3.6	Condition Diagram and Collision Diagrams	T1, R2	01	
		3.7	PCU factors-capacity of highways-LOS concept.	T1,R1	1	
		3.8	Types of LoS-Factors affecting LoS.	T1,R1	1	
		3.9	Traffic road signs-Types	T1,R1	1	
		3.10	Road markings-objectives and types.	T1,R1	1	
		3.11	Types of intersections-At grade and grade separated intersections-Types.	T1,R1	2	
		3.12	Design of rotary intersection.	T1,R1	1	
		3.13	Design of traffic signal-Webster method.	T1, R1	1	
				Total	**14**	
		UNIT - IV HIGHWAY MATERIALS				
4	Judge the suitability of pavement materials. [K2]	4.1	Sub-grade soil classification, Group Index	T1,R1	1	Chalk & Talk, Active Learning
		4.2	Sub-grade soil strength	T1,R1	1	
		4.3	California Bearing Ratio	T1, R1	1	
		4.4	Modulus of Sub-grade Reaction.	T1,R1	1	
		4.5	Stone aggregates	T1,R1	1	
		4.6	Desirable properties	T1, R1	1	
		4.7	Tests for Road Aggregates	T1,R1	2	
		4.8	Bituminous Materials: Types - Desirable properties	T1,R1	1	
		4.9	Tests on Bitumen	T1,R1	2	

		4.10	Bituminous paving mixes, Requirements	T1,R1	1	
		4.11	Marshall Method of Mix Design.	T1,R1	2	
				Total	**14**	
		UNIT-V DESIGN, CONSTRUCTION AND MAINTENANCE OF PAVEMENTS				
5	Design flexible and rigid pavements and their maintenance measures. [K3]	5.1	Types of pavements, Functions and requirements of pavement layers, Design factors.	T1, R2	1	Chalk & Talk, Active Learning
		5.2	Differences between flexible and rigid pavements.	T1, R2	1	
		5.3	Flexible pavements, design factors	T1, R2	1	
		5.4	Pavement design methods, CBR method	T1, R2	2	
		5.5	IRC method, Burmister method.	T1, R2	2	
		5.4	Rigid pavements, Design considerations.	T1, R2	1	
		5.5	wheel load stresses, temperature and frictional stresses.	T1, R2	1	
		5.6	Types of joints in CC pavements	T1, R2	1	
		5.7	Highway construction, Construction of earth roads.	T1, R2	1	
		5.8	Gravel roads, WBM roads.	T1, R2	1	
		5.9	Construction of bituminous and CC roads.	T1, R2	1	
		5.10	Pavement failures.	T1, R2	1	
		5.11	Maintenance of highways, pavement evaluation, strengthening of pavements.	T1, R2	1	
				Total	**15**	
				CUMULATIVE PROPOSED PERIODS	**70**	

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Khanna S.K, Justo C.E.G, and Veeraraghavan " Highway Engineering" Neem chand Bros, Roorkee, 10th Edition, 2016.
2	Kadiyali L.R, "Traffic Engineering and Transportation Planning", Khanna publishers, New Delhi, 2017.
3	Srinivaskumar R."Highway Engineering" University Press, Hyderabad, 2019.
4	Srinivaskumar R. "Traffic Engineering" University Press, Hyderabad, 2018.

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Srinivaskumar R. "Transportation Engineering" University Press, Hyderabad, 2020.
2	Kadiyali L.R, "Principles of Highway Engineering ", Khanna publishers, New Delhi, 2017.
3	Papacostas C.S, and P.D.prevedours"Transportation Engineering and planning", Prentice hall, New Delhi,2010.

IS Code Book:

1	IRC-37:2018- Design of Flexible Pavements. IRC-58-2015- Design of Rigid Pavements.

Web Details

1	http://nptel.ac.in/courses/105105107

		Name	Signature with Date
i.	Faculty	GVLN Murthy	
ii.	Course Coordinator	GVLN Murthy	
iii.	Module Coordinator	GVLN Murthy	
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