



# 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.D.T., Narsapur-534280, (Andhra Pradesh)

## DEPARTMENT OF CIVIL ENGINEERING

### TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
16CEST05	TRANSPORTATION ENGINEERING	V	CIVIL	5	2021-22	4.10.2021

#### **COURSE OUTCOMES**

Students are able to

1	Plan highway network for a given area. [K4]
2	Determine Highway alignment and design highway geometrics. [K3]
3	Illustrate Intersections and prepare traffic management plans [K2].
4	Judge suitability of pavement materials and pavement mixes. [K3]
5	Design of flexible and rigid pavements. [K4]
6	Know the Construct and maintenance of highways. [K3]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
<b>1. HIGHWAY PLANNING AND ALIGNMENT</b>						
1	Plan highway network for a given area. [K4]	1.1	<b>Highway Planning and Alignment:</b> highway development in India; classification of roads.	T1,T2	1	Chalk & Board, PPT
		1.2	Road network patterns, necessity for highway planning.	T1,T2	1	
		1.3	Different road development plans, first, second, third road development plans.	T1,T2	1	
		1.4	Road development vision 2021, rural road development plan - vision 2025.	T1,T2	2	
		1.5	Planning surveys; highway alignment-factors affecting alignment.	T1,T2	1	
		1.6	Engineering surveys - drawings and reports.	T1,T2	1	
		<b>Total</b>				
<b>2. HIGHWAY GEOMETRIC DESIGN</b>						
2	Determine Highway alignment and design highway	2.1	<b>Highway Geometric Design:</b> Importance of Geometric Design	T1,T2	1	Chalk & Board, PPT
		2.2	Design controls and Criteria	T1,T2	1	
		2.3	Highway Cross Section Elements.	T1,T2	1	
		2.4	Sight Distance Elements-Stopping sight	T1,T2	2	





# 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)

	geometrics [K3]		Distance			
		2.5	Overtaking Sight Distance and Intermediate Sight Distance.	T1,T2	1	
		2.6	Design of Horizontal Alignment	T1,T2	1	
		2.7	Design of Super elevation and Extra widening	T1,T2	1	
		2.8	Design of Transition Curves	T1,T2	1	
		2.9	Design of Vertical alignment	T1,T2	1	
		2.10	Gradients-Vertical curves.	T1,T2	1	
Total				11		
<b>3.0 Traffic Engineering</b>						
3	Illustrate Intersections and prepare traffic management plans [K2].	3.1	Traffic Engineering: Parameters of Traffic-Volume.	T1,T2	1	Chalk & Board, PPT
		3.2	Density- Traffic Volume Studies- Speed and Speed studies.	T1,T2	1	
		3.3	spot speed and speed & delay studies, Parking Studies.	T1,T2	2	
		3.4	Road Accidents-Causes and Preventive measures.	T1,T2	1	
		3.5	Condition Diagram and Collision Diagrams, PCU Factors.	T1,T2	1	
		3.6	Capacity of Highways- Factors Affecting; LOS Concepts.	T1,T2	2	
		3.7	Design of Traffic Signals -Webster Method.	T1,T2	1	
		3.8	Design of Traffic Signals -IRC Method.	T1,T2	1	
		3.9	Road Traffic Signs; Road markings, Types of Intersections; At-Grade Intersections.	T1,T2	2	
		3.10	Design of Plain, Flared, Rotary and Channelized Intersection.	T1,T2	2	
Total				14		
<b>4. HIGHWAY MATERIALS</b>						
4	Judge suitability of pavement materials and pavement mixes.[K3]	4.1	Highway Materials: Sub grade soil: classification	T1,T2	1	Chalk & Board, PPT
		4.2	Group Index – Sub grade soil strength.	T1,T2	1	
		4.3	California Bearing Ratio. Modulus of Sub grade Reaction.	T1,T2	2	
		4.4	Stone aggregates, Desirable properties-	T1,T2	1	
		4.5	Tests for Road Aggregates.	T1,T2	2	
		4.6	Bituminous Materials: Types - Desirable properties,	T1,T2	2	
		4.7	Tests on Bitumen -Bituminous paving	T1,T2	2	



# 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 Seetha/ampuram, W.G. DT., Narasapur-534280, (Andhra Pradesh)

		mixes: Requirements			
		4.8	Marshall Method of Mix Design.	T1,T2	1
				Total	12
<b>5. DESIGN OF PAVEMENTS</b>					
5	Design of flexible and rigid pavements [K4]	5.1	<b>Design Of Pavements:</b> Types of pavements.	T1,T2	1
		5.2	Functions and requirements of different components of pavements, Design Factors.	T1,T2	1
		5.2	<b>Flexible Pavements:</b> Design factors- Flexible Pavement Design Methods, CBR method	T1,T2	1
		5.3	IRC method Burmister method - Mechanistic method,	T1,T2	1
		5.4	IRC Method for Low volume Flexible pavements.	T1,T2	1
		5.5	<b>Rigid Pavements:</b> Design Considerations wheel load stresses	T1,T2	1
		5.6	Temperature stresses - Frictional stresses	T1,T2	1
		5.7	Combination of stresses. Design of slabs -	T1,T2	1
		5.8	Design of slabs - Design of Joints IRC method -	T1,T2	1
		5.9	Rigid pavements for low volume roads.	T1,T2	1
		5.10	Continuously Reinforced Cement Concrete Pavements.	T1,T2	1
Content Beyond Syllabus		<b>Pavement preservation tools</b>			
		5.11	<b>Highway Construction and Maintenance:</b> Types of Highway Construction.	T1,T2	1
		5.12	Earthwork- Construction of Earth Roads	T1,T2	1
		5.13	Gravel Roads. <b>Water Bound Macadam</b> Roads.	T1,T2	1
		5.14	Bituminous Pavements and Construction of Cement Concrete roads.	T1,T2	1
		5.15	Pavement Failures.	T1,T2	1
		5.16	Maintenance of Highways, pavement evaluation	T1,T2	1
		5.18	Strengthening of existing pavements.	T1,T2	1
Content Beyond Syllabus		<b>Introduction to IIT Pave</b>		T1,T2	1
				Total	19
<b>CUMULATIVE PROPOSED PERIODS</b>					63
<b>Text Books:</b>					
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				





# 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)

1	Khanna S.K., Justo C.E.G and Veeraragavan A, Highway Engineering, 10 <sup>th</sup> Edition , Nem Chand Bros, Roorkee, 2018.
2	Kadiyali L.R, Traffic Engineering and Transportation Planning, 2 <sup>nd</sup> Edition, Khanna Publishers, New Delhi, 2017.
3	Srinivasa Kumar R, Highway Engineering', Universities Press, Hyderabad. 2012
<b>Reference Books:</b>	
<b>S.No.</b>	<b>AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION</b>
1	Papacostas C.S. and PD Prevedouros, 'Transportation Engineering and Planning', 3 <sup>rd</sup> Edition, Prentice Hall of India Pvt. Ltd; New Delhi, 2015.
2	Kadiyali LR, Principles of Highway Engineering', 2 <sup>nd</sup> Edition, Khanna Publishers, New Delhi, 2016.
3	K S Subrahmanyam, Transportation Engineering, First Edition, Scitech publications, 2013.
<b>Web Details</b>	
1	<a href="https://nptel.ac.in/courses/105/101/105101087/">https://nptel.ac.in/courses/105/101/105101087/</a>
2	<a href="http://www.cdeep.iitb.ac.in/webpage_data/nptel/Civil%20Engineering/Transportation%20Engg%20I/TOC.htm">http://www.cdeep.iitb.ac.in/webpage_data/nptel/Civil%20Engineering/Transportation%20Engg%20I/TOC.htm</a>

	Name	Signature with Date
i. Faculty	G.V.L.N.Murthy	
ii. Course Coordinator	G.V.L.N.Murthy	
iii. Module Coordinator	G.V.L.N.Murthy	
iv. Programme Coordinator	G.V.L.N.Murthy	

Principal