



**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING**

REGULATION	BR23				
III B. TECH II SEMESTER	Course Code: 23CE6T02	L	T	P	C
		3	0	0	3
Course Title:	HIGHWAY ENGINEERING				

Course Learning Objectives:

The objectives of this course are:

- To impart different concepts in the field of Highway Engineering.
- To acquire design principles of Highway Geometrics and Pavements
- To acquire design principles of Intersections

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Plan high way network for a given area.
2. Determine High way alignment and design high way geometrics.
3. Design Intersections and prepare traffic management plans.
4. Judge suitability of pavement materials and design flexible and rigid pavements

UNIT I

Highway Planning and Alignment: Highway development in India; Classification of Roads; Road Network Patterns; Necessity for Highway Planning; Different Road Development Plans– First, second, third road development plans, road development vision 2021, Rural Road Development Plan – Vision 2025; Planning Surveys; Highway Alignment- Factors affecting Alignment-Engineering Surveys – Drawings and Reports.

UNIT – II Highway Geometric Design: Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements-Stopping Sight Distance, Overtaking Sight Distance and Intermediate Sight Distance- Design of Horizontal Alignment-Design of Super elevation and Extra widening- Design of Transition Curves- Design of Vertical Alignment- Gradients- Vertical curves.

UNIT – III Traffic Engineering: Basic Parameters of Traffic-Volume, Speed and Density- Traffic Volume Studies; Speed studies –spot speed and speed & delay studies; Parking Studies; Road Accidents- Causes and Preventive measures - Condition Diagram and Collision Diagrams; PCU Factors, Capacity of Highways – Factors Affecting; LOS Concepts; Road Traffic Signs; Road markings; Types of Intersections; At-Grade Intersections – Design of Plain, Flared, Rotary and Channelized Intersections; Design of Traffic Signals –Webster Method –IRC Method

Dr M C S MADAN HOD &BOS, Department of Civil Engineering, BVCITS Batlapalem	Dr G Yesuratnam Professor of Civil Engineering JNTU Kakinada (University Nomine)	Dr A Murali Krishna, Professor, Department of Civil Engineering, IIT Tirupathi.	Dr B Raghuram kadali, Asst Assistant Professor, Department of civil Engineering, NIT Warangal.	Mr P Rajesh Sr Engineer(P)SDVVL Survey &Constructions, Kakinada (Industrial Expert)	Mr Chakradhar Prasad Assistant Professor, Department of civil DNR College of Engineering Technology Bhimavaram. (Alumni Member)



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UNIT –IV

Highway Materials: Sub grade soil: classification –Group Index–Subgrade soil strength –California Bearing Ratio–Modulus of Subgrade Reaction. Stone aggregates: Desirable properties– Tests for Road Aggregates–Bituminous Materials: Types–Desirable properties—Testson Bitumen -Bituminous paving mixes: Requirements – Marshall Method of Mix Design

UNIT–V

Design of Pavements: Types of pavements; Functions and requirements of different components of pavements; Design Factors

Flexible Pavements: Design factors–Flexible Pavement Design Methods–CBR method–IRC method–Burmister method–Mechanistic method–IRC Method for Low volume Flexible pavements.

Rigid Pavements: Design Considerations – wheel load stresses – Temperature stresses –Frictional stresses–Combination of stresses–Design of slabs–Design of Joints–IRC method–Rigid pavements for low volume roads – Continuously Reinforced Cement Concrete Pavements – Roller Compacted Concrete Pavements.

TEXTBOOKS:

- 1.Highway Engineering, Khanna S.K., Justo C.E.G and Veeraragavan A, Nem Chand Bros., Roorkee, 2013th Edition 1 January 2013.
- 2.Traffic Engineering and Transportation Planning, Kadiyali L. R, Khanna Publishers, New Delhi, 1 January 1999
3. highway engineering by Khanna and Justo, 10th Edition 2018.

REFERENCES:

- 1.Principles of Highway Engineering, Kadiyali L. R, Khanna Publishers, New Delhi, 2019.
- 2.Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi, 2012.

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