

# **RAGHU ENGINEERING COLLEGE**

# AUTONOMOUS

(Approved by AICTE, New Delhi, & Permanently Affiliated to JNTU-GV, Vizianagaram) NBA & NAAC A+ grade Accredited institute

Dakamarri, Bheemili Mandal, Visakhapatnam Dist. – 531 162 (A.P.) Phone: +91-8922-248001, 248002, 9963981111, <u>www.raghuenggcollege.com</u>

#### **INSTITUTE VISION**

Envisioning to be a world class technical institution by synergizing quality education with ethical values.

### INSTITUTE MISSION

- To encourage training and research in cutting-edge technologies.
- To develop and strengthen strategic links with the industry.
- To kindle the zeal among the students and promote their quest for academic excellence.
- To encourage extra-curricular activities along with good communication skills.

### **QUALITY POLICY**

RAGHU Engineering College underscores ethical values along with innovative teaching through an interactive, activity-based pedagogy, establishes the best of infrastructural facilities, inculcates engineering temper among the students through the use of the latest Information and Communication Technologies and strives for an efficient, responsive and transparent administration in all areas

## **Department of Civil Engineering**

### VISION

To become a pioneer in the field of civil engineering by providing high quality education and research to serve the public consistently with competitive spirit professional ethics.

#### MISSION

- M1: Provide quality knowledge and advance skills to the students in order to expertise theoretically and practically in the areas of civil engineering.
- M2: Improve the professional potentiality of the students and staff through educational programs to expand the knowledge in the field of civil engineering
- M3: Inculcate healthy competitive spirit towards the higher education and successful career in the field of civil engineering to serve the nation ethically.

# PROGRAMME EDUCTIONAL OBJECTIVES(PEOs)

- **PEO 1**: Employ a practicing civil engineer in construction, design, testing, and allied fields.
- PEO 2: Engaging in self-directed learning research or undertaking higher studies in the rapidly changing civil engineering environment.
- PEO 3: Create new methods/processes to meet the needs of society with their civil engineering knowledge.

### MAPPING OF MISSION STATEMENTS WITH PEOS

MS/PEO	PEO 1	PEO 2	PEO 3
MS 1	3	3	2
MS 2	3	3	2
MS 3	3	3	2

1-Slight, 2- Moderate, 3- Substantial

	PROGRAM OUTCOMES								
	Graduates of Civil Engineering Will:								
PO 1	<b>Engineering knowledge</b> : Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.								
PO 2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.								
PO 3	<b>Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.								
PO 4	<b>Conduct investigations of complex problems</b> : Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.								
PO 5	<b>Modern tool usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.								
PO 6	<b>The engineer and society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.								
PO 7	<b>Environment and sustainability</b> : Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.								
PO 8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.								
PO 9	<b>Individual and team work</b> : Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.								
PO 10	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend								

	and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.							
PO 11	<b>Project management and finance</b> : Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.							
PO 12	<b>Life-long learning</b> : Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.							
	PROGRAM SPECIFIC OUTCOMES (PSOs)							

**PSO 1:** Analyze, design and execute the civil engineering structures with good knowledge in engineering, mathematics & basic sciences.

**PSO 2:** Follow the economic, environmental and safety factors involved in the construction industry.

#### Mapping of PEOs with POs and PSOs

PEO/PO	РО- 1	PO- 2	РО- 3	РО- 4	PO- 5	PO- 6	РО- 7	PO- 8	PO- 9	PO- 10	РО- 11	PO- 12	PSO- 1	PSO- 2
PEO 1	3	3	3	2	3	2	2	2	3	3	3	3	3	3
PEO 2	3	3	3	2	3	2	2	1	3	3	3	3	3	2
PEO 3	3	3	3	3	3	1	1	1	2	3	2	3	3	2

1-Slight, 2- Moderate, 3- Substantial

	2301104 TRANSPOR	Engine		KING				
Programme	B.Tech & CIVIL	Sem		L	Т	Р	Credi	
&Branch	B. Iech & CIVIL	Sem	Category	L	1	Г	Clear	
Prerequisites	Surveying	3	Professional Core	3	0	0	3	
Course Object	ives:		l	1				
2. To acq	art different concepts in the field uire design principles of Highwa n various highway construction	y Geor	metrics and Pav	vements.				
Preamble :	This course aims to equip stud	ents wi	ith the fundame	ntal prir	ciples a	and adv	anced	
knowledge necessary to address the challenges of modern transportation systems.								
	From traffic flow theory and tr		-		-	-		
infrastructure and intelligent transportation systems, students will explore various								
	aspects that contribute to the e	fficient	movement of	beople a	nd good	ls		
Course Conter	its:							
Unit-1	Highway Planning and Alignm	nent			Conta	act Hou	ırs: 9	
Highway Plan	ning and Alignment: Highway	develop	oment in India;	Classifi	cation	of Roa	ds; Roa	
Network Patte	rns; Necessity for Highway Pl	anning	; Different Roa	ad Deve	lopmen	t Plans	s – Firs	
second, third	road development plans, Rur	al Roa	d Developmen	t Plan–`	Vision	2025;	Plannir	
Surveys; High	way Alignment-Factors affecting	g Align	ment-Engineer	ing Surv	vevs			
		0	ment Engineer	ing bur v	e jo			
Unit-2	Highway Geometric Design	0 0		ing bur	-	act Hou	ırs: 9	
	Highway Geometric Design netric Design: Importance of Geo				Conta			
Highway Geor Cross Section	netric Design: Importance of Geo Elements-Sight Distance Ele	ometric ements-	Design-Design Stopping sigh	n control t Distar	Conta s and C nce, Ov	riteria-] vertakin	Highwa 1g Sig	
Highway Geor Cross Section Distance and	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance-	ometric ements- Design	Design-Design Stopping sigh of Horizonta	n control t Distan l Alignu	Conta s and C nce, Ov ment-D	riteria-J vertakin esign (	Highwa ng Sigl of Supe	
Highway Geor Cross Section Distance and elevation and H	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans	ometric ements- Design	Design-Design Stopping sigh of Horizonta	n control t Distan l Alignu	Conta s and C nce, Ov ment-D	riteria-J vertakin esign (	Highwa ng Sigl of Supe	
Highway Geor Cross Section Distance and elevation and H Vertical curves	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s.	ometric ements- Design	Design-Design Stopping sigh of Horizonta	n control t Distan l Alignu	Conta s and C nce, Ov ment-D al aligni	riteria-] vertakin esign ( nent-G	Highwa ng Sigl of Supe radient	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering	ometric ements- Design ition C	e Design-Design Stopping sigh of Horizonta urves- Design o	n control t Distan l Alignu f Vertica	Conta s and C nce, Ov ment-D al aligni	riteria-J vertakir esign ( nent-G act Hou	Highwa ng Sigl of Supe radient urs: 9	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr	ometric ements- Design ition C	Design-Design Stopping sigh of Horizonta urves-Design o	a control t Distar l Aligna f Vertica and De	Conta s and C nce, Ov ment-D al aligni Conta	riteria-J vertakin esign ( ment-G act Hou Traffic	Highwa ng Sigl of Supe radients urs: 9 Volum	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr I studies– spot speed and speed	ometric ements- Design ition C	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par	n control t Distan l Aligni f Vertica and De king Stu	Conta s and C nce, Ov ment-D al aligni Conta nsity- 7 udies; F	riteria- vertakin esign o ment-G act Hou Traffic Road A	Highwa ng Sigl of Supe radients urs: 9 Volum ccidents	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr I studies– spot speed and speed preventive measures- Condition	ometric Design ition C raffic-V & del	Design-Design Stopping sigh of Horizonta urves-Design o Volume, Speed lay studies; Par ram and Colli	n control t Distar l Align f Vertica and De king Stu sion Dia	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams;	riteria-J vertakin esign o ment-G act Hou Traffic Road A PCU	Highwa ng Sigl of Supe radients urs: 9 Volum ccidents Factor	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr I studies– spot speed and speed preventive measures- Condition ghways–Factors Affecting; LOS	ometric ements- Design ition C raffic-V & del n Diagn Conce	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff	and De king Stur and De king Stur sion Dia	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; ; Road r	riteria- vertakin esign o ment-G act Hou raffic Road A PCU narking	Highwa ng Sigl of Supe radient urs: 9 Volum ccident Factor gs; Type	
Highway Geor Cross Section Distance and elevation and F Vertical curves Unit-3 Traffic Engine Studies; Speed Causes and F Capacity of Hi of Intersection	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr I studies– spot speed and speed Preventive measures- Condition ghways–Factors Affecting; LOS s- At-Grade Intersections, Plain,	ometric ements- Design ition C affic-V & de Diag Conce Flared	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff	and De king Stur and De king Stur sion Dia	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; ; Road r	riteria- vertakin esign o ment-G act Hou raffic Road A PCU narking	Highwa ng Sigl of Supe radient urs: 9 Volum ccident Factor gs; Type	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies– spot speed and speed preventive measures- Condition ghways–Factors Affecting; LOS s- At-Grade Intersections, Plain, als–Webster Method –IRC Meth	ometric ements- Design ition C affic-V & de Diag Conce Flared	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff	and De king Stur and De king Stur sion Dia	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; Road r ed Inters	riteria- vertakin esign o ment-G act Hou raffic Road A PCU narking sections	Highwa ng Sig of Sup radient urs: 9 Volun ccident Factor gs; Type s; Desig	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Transis. Traffic Engineering eering: Basic Parameters of Tr studies– spot speed and speed Preventive measures- Condition ghways–Factors Affecting; LOS s- At-Grade Intersections, Plain, nals–Webster Method –IRC Meth Highway Materials	ometric ements- Design ition C affic-V & del Diagn Conce Flared hod.	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch	a control t Distan l Alignu f Vertica and De king Stu sion Dia ic Signs: annelize	Conta s and C nce, Over ment-D al aligning Conta nsity- ' udies; F agrams; Road r ed Inters	riteria- vertakin esign o ment-G act Hou Traffic Road A PCU narking sections	Highwa ng Sigl of Sup- radient urs: 9 Volum ccident Factor gs; Type s; Desig	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies– spot speed and speed reventive measures- Condition ghways–Factors Affecting; LOS s- At-Grade Intersections, Plain, hals–Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificat	ometric ements- Design ition C raffic-V & del a Diag Conce Flared hod.	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch	and De king Stu and De king Stu sion Dia ic Signs: annelize	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; Road r ed Inters Conta soil stre	riteria- vertakin esign o ment-G act Hou Traffic Road A PCU marking sections act Hou ngth-C	Highwa ng Sigl of Supe radient urs: 9 Volum ccident Factor gs; Type s; Desig	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate Bearing Ratio	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Transis. Traffic Engineering eering: Basic Parameters of Tr studies- spot speed and speed reventive measures- Condition ghways-Factors Affecting; LOS s- At-Grade Intersections, Plain, als-Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificati -Modulus of Sub grade Reactio	ometric ements- Design ition C affic-V & del Diagn Conce Flared hod.	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch oup Index– Sul one aggregates:	and De king Stu sion Dis annelize D grade s	Conta s and C nce, Over ment-D al aligning Conta nsity- ' udies; F agrams; Road r ed Inters Conta soil strep ole prop	riteria- vertakin esign o ment-G act Hou Traffic Road A PCU narking sections act Hou ngth-C	Highwa ng Sigl of Sup- radient urs: 9 Volum ccident Factor gs; Type s; Desig urs: 9 californ Tests fe	
Highway Geor Cross Section Distance and elevation and F Vertical curves Unit-3 Traffic Engine Studies; Speed Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate Bearing Ratio- Road Aggrega	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies- spot speed and speed reventive measures- Condition ghways-Factors Affecting; LOS s- At-Grade Intersections, Plain, als-Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificate -Modulus of Sub grade Reaction tes-Bituminous Materials: Types	ometric ements- Design ition C raffic-V & del raffic-V & del raffic-V flared hod. Flared hod.	Design-Design Stopping sigh of Horizonta urves- Design o olume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch oup Index– Sul one aggregates: rable properties	and De king Stu sion Dis annelize D grade s	Conta s and C nce, Over ment-D al aligning Conta nsity- ' udies; F agrams; Road r ed Inters Conta soil strep ole prop	riteria- vertakin esign o ment-G act Hou Traffic Road A PCU narking sections act Hou ngth-C	Highwa ng Sig of Sup radient urs: 9 Volum ccident Factor gs; Type s; Desig urs: 9 californ Tests fe	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate Bearing Ratio- Road Aggrega paving mixes:	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies- spot speed and speed preventive measures- Condition ghways-Factors Affecting; LOS s- At-Grade Intersections, Plain, eals-Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificati -Modulus of Sub grade Reaction tes-Bituminous Materials: Types Requirements-Marshall Method	ometric ements- Design ition C affic-V & del a Diagi Conce Flared hod. ion–Gr n. Sto s–Desin l of Mi	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch oup Index– Sul one aggregates: rable properties x Design.	and De king Stu sion Dis annelize D grade s	Conta s and C nce, Over ment-D al aligning Conta nsity- ' udies; F agrams; Road r ed Inters conta soil stree ple prop n Bitum	riteria-l vertakin esign o ment-G act Hou Traffic Road A PCU narking sections act Hou ngth-C perties-	Highwa ng Sigl of Supe radient urs: 9 Volum ccident Factor gs; Type s; Desig urs: 9 Californ Tests fe uminou	
Highway Geor Cross Section Distance and elevation and F Vertical curves Unit-3 Traffic Engine Studies; Speed Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate Bearing Ratio- Road Aggrega paving mixes: Unit-5	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies– spot speed and speed reventive measures- Condition ghways–Factors Affecting; LOS s- At-Grade Intersections, Plain, als–Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificati -Modulus of Sub grade Reactio tes–Bituminous Materials: Types Requirements–Marshall Method Highway Construction and M	ometric ements- Design ition C affic-V & del a Diag Conce Flared hod. Flared hod.	Design-Design Stopping sigh of Horizonta urves- Design o olume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch oup Index– Sul one aggregates: rable properties x Design. nance	and De king Stu ic Signs annelize Desirat –Tests o	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; conta soil stre ole prop n Bitum Conta	riteria- vertakin esign o ment-G act Hou Traffic Road Au PCU marking sections act Hou ngth-C perties- nen-Bit	Highwa ng Sigl of Supe radient urs: 9 Volum ccident Factor gs; Type s; Desig urs: 9 Californ Tests fe uminou	
Highway Geor Cross Section Distance and elevation and H Vertical curves Unit-3 Traffic Engine Studies; Speec Causes and F Capacity of Hi of Intersection of Traffic Sign Unit-4 Highway Mate Bearing Ratio- Road Aggrega paving mixes: Unit-5 Highway Cons	netric Design: Importance of Geo Elements-Sight Distance Ele Intermediate Sight Distance- Extra widening - Design of Trans s. Traffic Engineering eering: Basic Parameters of Tr studies- spot speed and speed preventive measures- Condition ghways-Factors Affecting; LOS s- At-Grade Intersections, Plain, eals-Webster Method –IRC Meth Highway Materials erials: Sub grade soil: classificati -Modulus of Sub grade Reaction tes-Bituminous Materials: Types Requirements-Marshall Method	ometric ements- Design ition C affic-V & del a Diag Conce Flared hod. ion–Gr n. Sto s–Desin l of Mi <b>Mainte</b> s of Hi	Design-Design Stopping sigh of Horizonta urves- Design o Volume, Speed lay studies; Par ram and Colli pts; Road Traff , Rotary and Ch oup Index– Sul one aggregates: rable properties x Design. nance ghway Constru	and De king Stu ic Signs: annelize o grade s Desirat –Tests o	Conta s and C nce, Ov ment-D al aligni Conta nsity- ' udies; F agrams; Road r ed Inters Conta soil stre ole prop n Bitum Conta	riteria-l vertakin esign o ment-G act Hou Traffic Road Ad PCU marking sections act Hou ngth-C perties- nen-Bit act Hou prk;	Highwa ng Sigl of Supo radient urs: 9 Volum ccident Factor gs; Typo s; Desig urs: 9 Californ Tests fo uminou urs: 9	

and Construction of Cement Concrete Pavements. Pavement Failures, Maintenance of Highways, pavement evaluation, strengthening of existing pavements

Total Hours: 45

Text Books:         1       Highway Engineering, Khanna S.K.,Justo C.E.Gand Veeraragavan A,NemChand Bros., Roorkee.         2       Traffic Engineering and Transportation Planning, Kadiyali L.R,Khanna Publishers, New Delhi.         Reference Books:         1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_90RFHqXsYqd 24wH0gP1hD         2       https://www.aec.edu.in/aec/Instruction_Material/TE_Lecture_Notes-Unit-1.pdf		
Roorkee.         2       Traffic Engineering and Transportation Planning, Kadiyali L.R, Khanna Publishers, New Delhi.         Reference Books:         1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD	Text	Books:
2       Traffic Engineering and Transportation Planning, Kadiyali L.R, Khanna Publishers, New Delhi. <b>Reference Books:</b> 1         1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD	1	Highway Engineering, Khanna S.K., Justo C.E.Gand Veeraragavan A, NemChand Bros.,
Delhi.         Reference Books:         1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD		Roorkee.
Reference Books:         1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD	2	Traffic Engineering and Transportation Planning, Kadiyali L.R,Khanna Publishers, New
1       Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi         2       Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD		Delhi.
<ul> <li>Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI Learning Private Limited, Delhi</li> <li>Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.</li> <li>Web References :         <ol> <li>https://www.youtube.com/watch?v=gLJutFmRC0s&amp;list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD</li> </ol> </li> </ul>	Refe	rence Books:
Learning Private Limited, Delhi         3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD	1	Principles of Highway Engineering, Kadiyali L.R, Khanna Publishers, New Delhi
3       Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice Hall of India Pvt. Ltd; New Delhi.         Web References :       1         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd 24wH0gP1hD	2	Principles of Transportation Engineering, Partha Chakraborty and Animesh Das, PHI
Hall of India Pvt. Ltd; New Delhi.         Web References :         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd         24wH0gP1hD		Learning Private Limited, Delhi
Web References :         1       https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd         24wH0gP1hD	3	Transportation Engineering and Planning, Papacostas C.S. and P.D. Prevedouros, Prentice
1         https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd           24wH0gP1hD		Hall of India Pvt. Ltd; New Delhi.
24wH0gP1hD	Web	References :
	1	https://www.youtube.com/watch?v=gLJutFmRC0s&list=PLm_MSClsnwm_9ORFHqXsYqd
2 https://www.aec.edu.in/aec/Instruction_Material/TE_Lecture_Notes-Unit-1.pdf		24wH0gP1hD
	2	https://www.aec.edu.in/aec/Instruction_Material/TE_Lecture_Notes-Unit-1.pdf

COURS	E OUTCOMES:	BT Mapped
Upon co	mpletion of the course, students shall have ability to	(Highest Level)
CO 1	Plan highway network for a given area	2
CO 2	Determine Highway alignment and design highway geometrics	3
CO 3	Design Intersections and prepare traffic management plans	4
CO 4	Judge suitability of pavement materials and design flexible and rigid pavements	4
CO 5	Construct and maintain highways	3

Mapping of Cos with POs and PSOs														
COs/POs	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PO-	PSO-	PSO-
COS/FOS	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO 1	3	3	2	3	2	2	2	2	3	3	2	2	3	3
CO 2	2	2	1	3	1	2	1	2	3	3	2	2	3	3
CO 3	3	2	1	3	1	2	1	2	3	3	2	2	3	3
CO 4	3	2	1	3	1	3	1	2	3	3	2	2	3	3
CO 5	3	2	2	3	3	3		2	3	3	2	2	3	3
1 – Slight,	2 - N	Iodera	te, 3-	- Subst	antial									

ASSES	ASSESSMENT PATERN - THEORY										
TEST	Remembering (K2)%	Understanding (K2)%	Applying (K2)%	Analyzing (K2)%	Evaluating (K2)%	Creating (K2)%	Total%				
MID- 1	6	9	85	-	-	-	100				
MID- 2	6	9	80	5	-	-	100				
SEE	10	10	80	-	-	-	100				
*± 3%	*± 3% may be varied										