



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

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Department of Civil Engineering		LP: CE18405
B.E/B.Tech/M.E/M.Tech : B.E.		Rev. No: 00
Regulation	: R2018 (Autonomous)	Date: 01/03/2022
PG Specialisation	: NA	
Sub. Code / Sub. Name	: CE 18405/ Transportation Engineering I	
Unit	: I – Highway Planning and Alignment	

Unit Syllabus:

History of Road development in India – Classification of Highways – Institutions for highway planning, design and construction in India – Factors influencing highway alignment – Engineering surveys for alignment, objectives, conventional and modern methods – Application of Statistics in Transportation Engineering: Regression Analysis.

Objective:

To give an overview about the highway engineering with respect to, planning, design, construction and maintenance of highways as per IRC standards, specifications and methods.

Session No *	Topics to be covered	Ref	Teaching aid
1	General introduction, Unit I-V brief discussion	-	BB/PPT
2	Road development in India: ancient roads, roads in Mughal period, Roads in British era, Jayakar committee formation and recommendations (CRF)	1-Ch.2; 12, 13	BB/PPT
3	Jayakar committee formation and recommendations (IRC, CRRRI), Nagpur road conference, first twenty year road development plan	1-Ch.2; 14, 15	BB/PPT
4	Second and third twenty year road development plans, Highway Research Board	1-Ch.2; 19, 20	BB/PPT
5	NHDP, PMGSY, road classifications	1-Ch.2; 21, 23	BB/PPT
6	Highway alignment, basic requirements, factors influencing alignment (list), obligatory points	1-Ch.3; 49-53	BB/PPT
7	Engineering surveys	1-Ch. 3; 54-61	BB/PPT
8	Engineering surveys, Regression analysis- Application in TE	1-Ch. 3; 54-61	BB/PPT
9	Selecting a dependent variable (target) and identifying independent variables (predictor variables) related to transportation engineering (problem)	Relevant web pages	BB/PPT
Content beyond syllabus covered (if any):			
Selecting a dependent variable (target) and identifying independent variables (predictor variables) related to transportation engineering			

* Session duration: 50 minutes

**Sub. Code / Sub. Name:** CE 18405 Transportation Engineering I**Unit II** : Geometric Design of Highways**Unit Syllabus:**

Typical cross-section of urban and rural roads – Cross-sectional elements – Horizontal curves, Superelevation, transition curves, widening of curves – Sight distances – Vertical curves, gradients, hairpin bends – Lateral and vertical clearance at underpasses – IRC standards

Objective:

To give an overview about the highway engineering with respect to, planning, design, construction and maintenance of highways as per IRC standards, specifications and methods.

Session No	Topics to be covered	Ref	Teaching Aids
9	Highway Cross sectional elements	1 – Ch.4; pg.72-166	BB/PPT
10	Highway Cross sectional elements	1 – Ch.4; pg.72-166	BB/PPT
11	Stopping Sight Distance	1 – Ch.4; pg.72-166	BB/PPT
12	Overtaking Sight Distance - concept	1 – Ch.4; pg.72-166	BB/PPT
13	OSD Problem	1 – Ch.4; pg.72-166	
14	Super-elevation problem only	1 – Ch.4; pg.72-166	BB/PPT
15	Transition Curve - Concept	1 – Ch.4; pg.72-166	BB/PPT
16	Transition Curve - Problem	1 – Ch.4; pg.72-166	BB/PPT
17	Extra widening at curves	1 – Ch.4; pg.72-166	BB/PPT
18	Extra widening at curves-problems	1 – Ch.4; pg.72-166	BB/PPT

Content beyond syllabus covered (if any):



Sub. Code / Sub. Name: CE 18405 Transportation Engineering I
Unit III : Pavement Engineering

Unit Syllabus:

Design factors of flexible and rigid pavement- Design of flexible pavement using IRC:37-2012;
Design of Rigid Pavement using IRC:58-2011

Objective:

To give an overview about the highway engineering with respect to, planning, design, construction and maintenance of highways as per IRC standards, specifications and methods.

Session No	Topics to be covered	Ref	Teaching Aids
19	Introduction, flexible pavement Vs. rigid pavement	1-Ch.7; pp.388-495	BB/PPT
20	Flexible pavement cross section - functions	1-Ch.7; pp.388-495	BB/PPT
21	Factors affecting flexible pavement design	1-Ch.7; pp.388-495	BB/PPT
22	Flexible pavement design procedure	1-Ch.7; pp.388-495	BB/PPT
23	Flexible pavement design procedure	1-Ch.7; pp.388-495	BB/PPT
24	Factors affecting rigid pavement design	1-Ch.7; pp.388-495	BB/PPT
25	Rigid pavement design – Westergaard's analysis	1-Ch.7; pp.388-495	BB/PPT
26	Rigid pavement design – Westergaard's analysis	1-Ch.7; pp.388-495	BB/PPT
27	Rigid pavement design – Westergaard's analysis	1-Ch.7; pp.388-495	BB/PPT

Content beyond syllabus covered (if any):

Local site visit



Sub. Code / Sub. Name: CE 18405 Transportation Engineering I

Unit IV : Highway Construction and Maintenance

Unit Syllabus:

Highway construction materials, properties, testing methods – Construction practice including modern materials and methods of construction of concrete and flexible pavements – Highway drainage – Special consideration for hill roads; Evaluation and maintenance of pavements

Objective:

To give an overview about the highway engineering with respect to, planning, design, construction and maintenance of highways as per IRC standards, specifications and methods.

Session No	Topics to be covered	Ref	Teaching Aids
28	Highway construction materials – test on soil	1-Ch.6; pg.309-387	BB/PPT
29	Highway construction materials – test on Bitumen	1-Ch.6; pg.309-387	BB/PPT
30	Highway construction materials – test on Aggregates	1-Ch.6; pg.309-387	BB/PPT
31	Construction Practice	1-Ch.8; pg.496-588	BB/PPT
32	Construction Practice	1-Ch.8; pg.496-588	BB/PPT
33	Highway Drainage	1-Ch.11;pp.690-709	BB/PPT
34	Highway Drainage	1-Ch.11;pp.690-709	BB/PPT
35	Structural Evaluation of Pavement	1-Ch.10;pp.617-689	BB/PPT
36	Structural Evaluation of Pavement	1-Ch.10;pp.617-689	BB/PPT
Content beyond syllabus covered (if any):			



Sub. Code / Sub. Name: CE 18405 Transportation Engineering I

Unit V : Highway Economic and Finance

Unit Syllabus:

Introduction, Highway user benefits, Highway costs, Vehicle Operating Cost, Economic Analysis, Highway Projects under Public-Private Sector participation, Bidding processes, Highway finance.

Objective:

To give an overview about the highway engineering with respect to, planning, design, construction and maintenance of highways as per IRC standards, specifications and methods.

Session No	Topics to be covered	Ref	Teaching Aids
37	Introduction	1-Ch.14;pp.744-763	BB/PPT
38	Highway user benefits	1-Ch.14;pp.744-763	BB/PPT
39	Highway user benefits	1-Ch.14;pp.744-763	BB/PPT
40	Highway Cost	1-Ch.14;pp.744-763	BB/PPT
41	Highway Cost	1-Ch.14;pp.744-763	BB/PPT
42	Economic Analysis	1-Ch.14;pp.744-763	BB/PPT
43	Economic Analysis	1-Ch.14;pp.744-763	BB/PPT
44	Highway financing	1-Ch.14;pp.744-763	BB/PPT
45	Highway financing	1-Ch.14;pp.744-763	BB/PPT


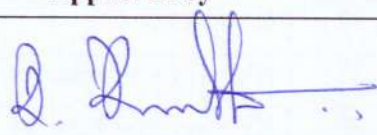
Content beyond syllabus covered (if any):

**Textbooks:**

1. Veeraragavan.A, Khanna.K and Justo C.E.G. Highway Engineering, Nem Chand and Brothers Publishers, 2016 (10th edition).
2. Kadiyali L.R. Principles and Practices of Highway Engineering, Khanna Technical Publisher, Delhi, 1999.

References:

1. ParthaChakroborty and Animesh Das. Principles of Transportation Engineering, PHI Learning Private Limited, 2017 (Second edition).
2. R.Srinivasa Kumar. Textbook of Highway Engineering, Universities Press (India) Pvt. Ltd., Hyderabad, 2011.
3. Indian Road Congress (IRC). Guidelines and Special Publications on Planning and Design of Highways.

	Prepared by	Approved by
Signature		
Name	Dr. M. Selvakumar	Dr. R. Kumutha
Designation	Associate Professor	Head of the Department
Date	01 / 03 / 2022	01 / 03 / 2022
Remarks *:	Same Lesson plan is followed as in A x 2020-21	
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD