

Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY , BANGALORE-90



COURSE PLAN

Academic Year 2019-20

Program:	B E – CIVIL ENGINEERING
Semester :	7
Course Code:	15CV751
Course Title:	URBAN TRANSPORTATION AND PLANNING
Credit / L-T-P:	3/ 3-0-0
Total Contact Hours:	40
Course Plan Author:	SHIVAPRASAD D G

Academic Evaluation and Monitoring Cell

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Note : Remove "Table of Content" before including in CP Book

Each Course Plan shall be printed and made into a book with cover page

Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

A. COURSE INFORMATION

1. Course Overview

Degree:	B.E	Program:	CIVIL ENGINEERING
Semester:	7	Academic Year:	2019-20
Course Title:	Urban Transportation and Planning	Course Code:	15cv751
Credit / L-T-P:	3/3-0-0	SEE Duration:	180 Minutes
Total Contact Hours:	40	SEE Marks:	80 Marks
CIA Marks:	20	Assignment	1 / Module
Course Plan Author:	Shivaprasad D G	Sign	Dt:
Checked By:	Mohan K T	Sign	Dt:
CO Targets	CIA Target : 85%	SEE Target:	80%

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Module	Content	Teaching Hours	Identified Module Concepts	Blooms Learning Levels
1	Urbanization, urban class groups, transportation problems and identification, impacts of transportation, urban transport system planning process, modeling techniques in planning. Urban mass transportation systems: urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, capacity, merits and comparison of systems, coordination, types of coordination.	08	Transport Planning	L2
2	Collection of data – Organisation of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use of Secondary Sources, Economic data – Income – Population – Employment – Vehicle Owner Ship.	08	Data collection	L3
3	UTPS Approach, Trip Generation Analysis: Zonal Models, Category Analysis, Household Models, Trip Attraction models, Commercial Trip Rates; Trip Distribution by Growth Factor Methods	08	Trip Generation	L4
4	Gravity Models, Opportunity Models, Time Function Iteration Models. Travel demand modeling: gravity model, opportunity models, Desire line diagram. Modal split analysis, problems	08	Trip Distribution	L4
5	Diversion Curves; Basic Elements of Transport Networks, Coding, Route Properties, Path Building Criteria, Skimming Tree, All-or-Nothing Assignment, Capacity Restraint Techniques, Reallocation of Assigned Volumes, Equilibrium Assignment. Introduction to land use planning models, land use and transportation interaction.	08	Trip Assignment	L4
-	Total	40	-	-

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video ; one per concept ; to understand the concepts ; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used ; Free / open source

3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Modul es	Details	Chapters in book	Availability
A	Text books (Title, Authors, Edition, Publisher, Year.)	-	-
1, 2, 3, 4, 5	Kadiyali.L.R., 'Traffic Engineering and Transportation Planning', Khanna Publishers, New Delhi.	1,3, 4	In Lib
1,5	Hutchinson, B.G, 'Introduction to Urban System Planning', McGraw Hill.	4, 6	In Lib
B	Reference books (Title, Authors, Edition, Publisher, Year.)	-	-
1, 2,3	Mayer M and Miller E, 'Urban Transportation Planning: A decision oriented Approach', McGraw Hill.	3,4	Not available
C	Concept Videos or Simulation for Understanding	-	-
C1	https://nptel.ac.in/courses/105105107/		
C2	https://nptel.ac.in/courses/105107067/11		
	https://www.youtube.com/redirect?q=http%3A%2F%2Fnpptel.iitm.ac.in&event=video_description&v=YAEyLOCU-8l&redir_token=Zm82kES57QKb5c2O6fGA1wxhBe58MTU1NTIzNDAxOEAxNTU1MTQ3NjE4		
C3	https://www.youtube.com/redirect?q=http%3A%2F%2Fnpptel.iitm.ac.in&v=wSp3BPasMRo&redir_token=PaBLx_T_sngphXZj-1o06vh3au58MTU1NTIzNDA0OEAxNTU1MTQ3NjQ4&event=video_description		
D	Software Tools for Design	-	-
E	Recent Developments for Research	-	-
F	Others (Web, Video, Simulation, Notes etc.)	-	-

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

Students must have learnt the following Courses / Topics with described Content . . .

Mod ules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level
1	15cv561	Traffic Engineering	Knowledge of Traffic flow characteristics	5		L2
-						

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.

Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Mod ules	Topic / Description	Area	Remarks	Blooms Level
2,3,4	Intelligent Public Transportation	Traffic management system	An ideal Traffic management system can be a one-stop solution for problems such as, traffic congestion, road accidents etc,	L3

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B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

Modules	Course Code.#	Course Outcome At the end of the course, student should be able to . . .	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
1	15cv751.1	Analyze the planning process required by Identifying different transport system for different category of traffic	08	Transport Planning	Lecture	Internal test Assignment	L2
2	15cv751.2	Conduct traffic surveys to provide the data required for transportation planning	08	Data collection	Lecture	Internal test Assignment	L3
3	15cv751.3	Determinate the trips generated using trip model methods for specific type of landuse development	08	Trip Generation	Lecture	Internal test Assignment	L3
4	15cv751.4	Distribute the trips by considering the travel demand modeling, desire line diagram for generated trips	08	Trip Distribution	Lecture	Internal test Assignment	L4
5	15cv751.5	Assigning the trips by capacity restraint, all or nothing technique based on route properties, path building criteria	08	Trip assignment	Lecture	Internal test Assignment	L4
-	-	Total	40	-	-	-	L2-L4

2. Course Applications

Write 1 or 2 applications per CO.

Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	Transport System Planning for a City/Town	CO1	L2
2	Traffic volume count	CO2	L3
3	Traffic management,	CO3	L3
3	Signal Designing	CO4	L4
4	Traffic management and its components	CO4	L4
5	Transport Planning	CO5	L4

3. Mapping And Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair.

To attain competency required (as defined in PO s) in a specified area and the knowledge & ability required to accomplish it.

Modules	Mapping CO	Mapping PO	Mapping Level	Justification for each CO-PO pair	Level
-	CO	PO	-	'Area': 'Competency' and 'Knowledge' for specified 'Accomplishment'	-
1	CO1	PO9	L2	It requires to work as an individual or in a team to study and Identify the different transport system for different category of traffic	L2
1	CO1	P10	L2	It involves in writing effective reports and presentations for the problems in existing transport system	L2
1	CO1	P12	L2	Life long learning happens as transportation problems will change from year to year and planning process accordingly	L2
2	CO2	P01	L3	It involves the knowledge of mathematics for conducting traffic surveys	L3

2	CO2	P09	L3	It requires to work as an individual or in a team to conduct traffic surveys	L3
2	CO2	P10	L3	It involves in writing effective reports and presentations for the conducted traffic surveys	L3
3	CO3	P01	L3	It involves the knowledge of mathematics for calculating the number of trips for a study area	L3
3	CO3	P04	L3	Involves analysis and interpretation of vehicle data, and synthesis of the data to provide the correct trip distribution rates.	L3
4	CO4	P01	L4	It involves the knowledge of mathematics for calculating the total number trips	L4
4	CO4	P04	L4	Involves analysis and interpretation of trip generation, and synthesis of the data to provide the correct trip distribution rates.	L4
5	CO5	P01	L4	It involves the knowledge of mathematics for assigning the total number trips	L4
5	CO5	P03	L4	It involves finding the best trip assignment for traffic problems and design the other transport components	L4
5	CO5	P04	L4	Involves analysis and interpretation of trip distribution, trip generation, and synthesis of the data to assign the trip to a particular route.	L4

4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

Mod ules	CO.#	Course Outcomes At the end of the course student should be able to ...	Program Outcomes												PS O1	PS O2	PS O3	Lev el
			PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12				
1	15CV751.1	Analyze the planning process required by Identifying different transport system for different category of traffic	-	-	-	-	-	-	-	-	-	2	1	2				L2
2	15CV751.2	Conduct traffic surveys to provide the data required for transportation planning	2	-	-	-	-	-	-	-	-	2	1	2				L3
3	15CV751.3	Determinate the trips generated using trip model methods for specific type of landuse development	3	-	-	1	-	-	-	-	-	-	-	-				L3
4	15CV751.4	Distribute the trips by considering the travel demand modeling, desire line diagram for generated trips	1	-	-	2	-	-	-	-	-	-	-	-				L4
5	15CV751.5	Assigning the trips by capacity restraint, all or nothing technique based on route properties, path building criteria	1	-	-	2	3	-	-	-	-	-	-	-				L4
-	CS501PC	Average attainment (1, 2, or 3)	1.7	-	-	1.6	3	-	-	-	2	1	-	2				-
-	PO, PSO	1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design																

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Mod ules	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping

6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc.

Mod ules	Gap Topic	Area	Actions Planned	Schedule Planned	Resources Person	PO Mapping

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Mod ules	Title	Teach. Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Urban transport planning	8	2	-	-	1	1	2	CO1	L2
2	Data Collection And Inventories	8	2	-	-	1	1	2	CO2	L3
3	Trip Generation & Distribution	8	-	2	-	1	1	2	CO3	L3
4	Trip Distribution	8	-	2	-	1	1	2	CO4	L4
5	Traffic Assignment	8	-	-	4	1	1	2	CO5	L4
-	Total	40	4	4	4	5	5	10	-	-

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Mod ules	Evaluation	Weightage in Marks	CO	Levels
1, 2	CIA Exam - 1	15	CO1, CO2,	L2, L3
3, 4	CIA Exam - 2	15	CO3, CO4	L2, L3
5	CIA Exam - 3	15	CO4, CO5	L4
1, 2	Assignment - 1	05	CO1, CO2,	L2, L3,
3, 4	Assignment - 2	05	CO3, CO4	L2, L3
5	Assignment - 3	05	CO4, CO5	L3, L4
1, 2	Seminar - 1		-	-
3, 4	Seminar - 2		-	-
5	Seminar - 3		-	-
1, 2	Quiz - 1		-	-
3, 4	Quiz - 2		-	-
5	Quiz - 3		-	-
1 - 5	Other Activities - Mini Project	-		
	Final CIA Marks	20	-	-

D1. TEACHING PLAN - 1

Module - 1

Title:	Introduction	Appr Time:	16 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	Analyze the planning process required by Identifying different transport system for different category of traffic	CO1	L2
b	Course Schedule	-	-
Class No	Portion covered per hour	CO	Level
1	Urbanization, urban class groups, transportation problems and identification	CO1	L2
2	impacts of transportation, urban transport system planning process	CO1	L2
3	modeling techniques in planning. Urban mass transportation systems	CO1	L2
4	urban transit problems, travel demand, types of transit systems,	CO1	L2
5	public, private, para-transit transport, mass and rapid transit systems	CO1	L2
6	BRTS and Metro rails	CO1	L2
7	capacity, merits and comparison of systems	CO1	L2
8	coordination, types of coordination	CO1	L2
c	Application Areas	CO	Level
1	Transport Planning of a City/Town	CO1	L2
d	Review Questions	-	-
1	Explain Scope of Urban transport planning	CO1	L2
2	Define Transport Planning. Explain the "Interdependence of land use and traffic"	CO1	L2
e	Experiences	-	-
1			
2			
3			
4			
5			

Module - 2

Title:	Data Collection And Inventories:	Appr Time:	10 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	Conduct traffic surveys to provide the data required for transportation planning	CO2	L3
b	Course Schedule	-	-
Class No	Module Content Covered	CO	Level
17	Data Collection And Inventories: Collection of data – Organisation of surveys and Analysis	CO2	L3

18	Study Area, Zoning, Types and Sources of Data	CO2	L3
19	Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys	CO2	L3
20	Sampling Techniques, Expansion Factors	CO2	L3
21	Sampling Techniques, Expansion Factors	CO2	L3
22	Accuracy Checks, Use of Secondary Sources	CO2	L3
23	Economic data – Income – Population – Employment – Vehicle Owner Ship	CO2	L3
c	Application Areas	CO	Level
1	Traffic volume count	CO2	L3
2	Zoning	CO2	L4
d	Review Questions	-	-
12	Explain Trip Distribution and List the methods of Trip Distribution	CO3	L1
13	Explain travel demand and its categories in urban transport	CO2	L3
14	List out the assumptions and disadvantages of Uniform Growth factor method	CO3	L2
15	Explain the average growth factor method with equation	CO2	L3
16	Define furness method of Trip Distribution with equation	CO2	L2
e	Experiences	-	-
1		CO1	L2
2			
3			
4		CO3	L3
5			

E1. CIA EXAM – 1

a. Model Question Paper – 1

Crs Code:	10CV751	Sem:	VII	Marks:	30	Time:	75 minutes	
Course:	Urban Transportation and Planning							
-	-	Note: Answer any 1 FULL question from each part, all questions carry equal marks.				Marks	CO	Level
1	a	What is the necessity of urban transport planning		07	CO1	L2		
	b	Explain Trip Distribution and List the methods of Trip Distribution		08	CO2	L2		
		OR						
2	a	Explain travel demand and its categories in urban transport		07	CO1	L2		
	b	List out the assumptions and disadvantages of Uniform Growth factor method		08	CO2	L2		
3	a	Explain the average growth factor method with equation		07	CO1	L2		
	b	Define furness method of Trip Distribution with equation		08	CO2	L2		
		OR						
4	a	Define "Zone". Mention the different factors considered in dividing the whole area of to zones.		07	CO1	L2		
	b	Mention the factors for selection an urban transport study area.		08	CO2	L2		

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions								
Crs Code:	10CV751	Sem:	VII	Marks:	5 / 10	Time:	90 – 120 minutes	
Course:	Urban Transportation and Planning							
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.								
SNo	USN	Assignment Description				Marks	CO	Level
1		Define "Zone". Mention the different factors considered in dividing the whole area of to zones.				5	CO1	L2
2		Mention the factors for selection an urban transport study area.				5	CO2	L3
3		What is the necessity of urban transport planning					CO2	L2
4		Explain Trip Distribution and List the methods of Trip Distribution				5	CO1	L3
5		Explain travel demand and its categories in urban transport						
6		List out the assumptions and disadvantages of Uniform Growth factor method					CO1	L2
7		Explain the average growth factor method with equation					CO2	L3
8		Define furness method of Trip Distribution with equation					CO2	L2
9		Explain Trip Distribution and List the methods of Trip Distribution					CO1	L3
10		Explain travel demand and its categories in urban transport					CO1	L2
11		List out the assumptions and disadvantages of Uniform Growth factor method					CO2	L3
12		Explain the average growth factor method with equation					CO2	L2
13		Define furness method of Trip Distribution with equation					CO1	L3
14		Define "Zone". Mention the different factors considered in dividing the whole area of to zones.				5	CO1	L2
15		Mention the factors for selection an urban transport study area.				5	CO2	L3
16		What is the necessity of urban transport planning					CO2	L2
17		Explain Trip Distribution and List the methods of Trip Distribution				5	CO1	L3
18		Explain travel demand and its categories in urban transport						
19		List out the assumptions and disadvantages of Uniform Growth factor method					CO1	L2
20		Explain the average growth factor method with equation					CO2	L3
21		Define furness method of Trip Distribution with equation					CO2	L2
22		Explain Trip Distribution and List the methods of Trip Distribution					CO1	L3
23		Explain travel demand and its categories in urban transport					CO1	L2
24		List out the assumptions and disadvantages of Uniform Growth factor method					CO2	L3
25		Explain the average growth factor method with equation					CO2	L2
26		Define furness method of Trip Distribution with equation					CO1	L3
27		Define "Zone". Mention the different factors considered in dividing the whole area of to zones.				5	CO1	L2
28		Mention the factors for selection an urban transport study area.				5	CO2	L3
29		What is the necessity of urban transport planning					CO2	L2
30		Explain Trip Distribution and List the methods of Trip Distribution				5	CO1	L3
31		Explain travel demand and its categories in urban transport						
32		List out the assumptions and disadvantages of Uniform					CO1	L2

		Growth factor method			
33		Explain the average growth factor method with equation		CO2	L3
34		Define furness method of Trip Distribution with equation		CO2	L2
35		Explain Trip Distribution and List the methods of Trip Distribution		CO1	L3
36		Explain travel demand and its categories in urban transport		CO1	L2
37		List out the assumptions and disadvantages of Uniform Growth factor method		CO2	L3
38		Explain the average growth factor method with equation		CO2	L2
39		Define furness method of Trip Distribution with equation		CO1	L3
40		Define "Zone". Mention the different factors considered in dividing the whole area of to zones.	5	CO1	L2
41		Mention the factors for selection an urban transport study area.	5	CO2	L3
42		What is the necessity of urban transport planning		CO2	L2
43		Explain Trip Distribution and List the methods of Trip Distribution	5	CO1	L3
44		Explain travel demand and its categories in urban transport			
45		List out the assumptions and disadvantages of Uniform Growth factor method		CO1	L2
46		Explain the average growth factor method with equation		CO2	L3
47		Define furness method of Trip Distribution with equation		CO2	L2
48		Explain Trip Distribution and List the methods of Trip Distribution		CO1	L3
49		Explain travel demand and its categories in urban transport		CO1	L2
50		List out the assumptions and disadvantages of Uniform Growth factor method		CO2	L3
51		Explain the average growth factor method with equation		CO2	L2
52		Define furness method of Trip Distribution with equation		CO1	L3
53		Define "Zone". Mention the different factors considered in dividing the whole area of to zones.	5	CO1	L2
54		Mention the factors for selection an urban transport study area.	5	CO2	L3
55		What is the necessity of urban transport planning		CO2	L2
56		Explain Trip Distribution and List the methods of Trip Distribution	5	CO1	L3
57		Explain travel demand and its categories in urban transport			
58		List out the assumptions and disadvantages of Uniform Growth factor method		CO1	L2
59		Explain the average growth factor method with equation		CO2	L3
60		Define furness method of Trip Distribution with equation		CO2	L2
61		Explain Trip Distribution and List the methods of Trip Distribution		CO1	L3
62		Explain travel demand and its categories in urban transport		CO1	L2
63		List out the assumptions and disadvantages of Uniform Growth factor method		CO2	L3
64		Explain the average growth factor method with equation		CO2	L2
65		Define furness method of Trip Distribution with equation		CO1	L3
66		Explain the average growth factor method with equation		CO2	L3

D2. TEACHING PLAN - 2

Module – 3

Title:	Trip Generation	Appr Time:	16 Hrs												
a	Course Outcomes	-	Blooms Level												
-	The student should be able to:	-	Level												
1	Determinate the trips generated using trip model methods for specific type of landuse development	CO3	L3												
b	Course Schedule														
Class No	Module Content Covered	CO	Level												
1	UTPS Approach, Trip Generation Analysis	CO3	L3												
2	Zonal Models, Category Analysis	CO3	L3												
3	Household Models, Trip Attraction models, Commercial Trip Rates	CO3	L3												
4	Trip Distribution by Growth Factor Method	CO3	L3												
5	Problems on Trip Distribution by Growth Factor Method	CO3	L3												
c	Application Areas	CO	Level												
1	Traffic management	CO3	L5												
2	Signal Designing	CO3	L5												
d	Review Questions	-	-												
1	Explain Growth factor method and Synthetic methods.	CO3	L3												
2	The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Zone</th> <th>Trip produced</th> <th>Trips attracted</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>2000</td> <td>3000</td> </tr> <tr> <td>B</td> <td>3000</td> <td>4000</td> </tr> <tr> <td>C</td> <td>4000</td> <td>2000</td> </tr> </tbody> </table> It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.	Zone	Trip produced	Trips attracted	A	2000	3000	B	3000	4000	C	4000	2000	CO3	L3
Zone	Trip produced	Trips attracted													
A	2000	3000													
B	3000	4000													
C	4000	2000													
3	List the methods of trip distribution & differentiate growth factor method with synthetic method	CO3	L3												
4	Write short notes on Home based trip and non home based trip	CO3	L3												
5	What is the external cordon line? Explain the factors on which the selection of external cordon line depends	CO3	L3												
e	Experiences	-	-												
1															
2															

Module – 4

Title:	Trip Distribution	Appr Time:	16 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	Level
1	Distribute the trips by considering the travel demand modeling, desire line diagram for generated trips	CO4	L4
b	Course Schedule		
Class No	Module Content Covered	CO	Level

1	Trip Distribution: Gravity Models	CO4	L4
2	Opportunity Models, Time Function Iteration Models	CO4	L4
3	Travel demand modeling: gravity model	CO4	L4
4	Travel demand modeling: opportunity models	CO4	L4
5	Desire line diagram. Modal split analysis	CO4	L4
6	Problems	CO4	L4
c	Application Areas	CO	Level
1	Traffic management and its components	CO4	L4
d	Review Questions	-	-
1	Explain the Inventory of transportation facilities.	CO4	L4
2	What is Category analysis? Mention the assumptions made in category analysis.	CO4	L4
3	What are the advantages and disadvantages of pre distribution modal split?	CO4	L4
4	What is a Desire line diagram	CO4	L4
5	Explain Gravity Models	CO4	L4
e	Experiences	-	-
1			
2			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	10CV751	Sem:	VII	Marks:	30	Time:	75 minutes	
Course:	Urban Transportation and Planning							
-	-	Note: Answer any 1 FULL question from each part, all questions carry equal marks.				Marks	CO	Level
1	a	Explain the Inventory of transportation facilities.				07	CO4	L3
	b	What is Category analysis? Mention the assumptions made in category analysis.				08	CO4	L3
		OR						
2	a	What are the advantages and disadvantages of pre distribution modal split?				20	CO4	L3
	b	What is a Desire line diagram					CO4	L3
	c	Write short notes on Home based trip and non home based trip					CO4	L3
		OR						
3	a	Explain Growth factor method and Synthetic methods.				07	CO4	L3
	b	The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as Zone Trip produced Trips attracted A 2000 3000 B 3000 4000 C 4000 2000 It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.				08	CO4	L4
		OR						
4	a	List the methods of trip distribution & differentiate growth factor method with synthetic method				07	CO3	L3
	b	What is the external cordon line? Explain the factors on which the				08	CO4	L3

	selection of external cordon line depends			
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b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions																	
Crs Code:	10CV751	Sem:	VII	Marks:	5 / 10	Time:	90 – 120 minutes										
Course:	Urban Transportation and Planning																
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.																	
SNo	USN	Assignment Description	Marks	CO	Level												
1		Explain the Inventory of transportation facilities.	05	CO3	L3												
2		What is Category analysis? Mention the assumptions made in category analysis.	05	CO4	L3												
3		What are the advantages and disadvantages of pre distribution modal split?	05	CO3	L3												
4		What is a Desire line diagram	05	CO3	L3												
5		Explain Gravity Models	05	CO4	L3												
6		Explain the Inventory of transportation facilities.	05	CO4	L3												
7		What is Category analysis? Mention the assumptions made in category analysis.	05	CO3	L3												
8		What is a Desire line diagram	05	CO3	L3												
9		Write short notes on Home based trip and non home based trip	05	CO3	L3												
10		Explain Growth factor method and Synthetic methods.	05	CO3	L3												
11		The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Zone</th> <th>Trip produced</th> <th>Trips attracted</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>2000</td> <td>3000</td> </tr> <tr> <td>B</td> <td>3000</td> <td>4000</td> </tr> <tr> <td>C</td> <td>4000</td> <td>2000</td> </tr> </tbody> </table> It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.	Zone	Trip produced	Trips attracted	A	2000	3000	B	3000	4000	C	4000	2000	05	CO3	L4
Zone	Trip produced	Trips attracted															
A	2000	3000															
B	3000	4000															
C	4000	2000															
12		List the methods of trip distribution & differentiate growth factor method with synthetic method	05	CO4	L3												
13		What is the external cordon line? Explain the factors on which the selection of external cordon line depends	05	CO3	L3												
14		Explain Growth factor method and Synthetic methods.	05	CO4	L3												
15		Write short notes on Home Interview survey	05	CO3	L3												
16		Write short notes on Commercial vehicle survey	05	CO3	L3												
17		Explain the Inventory of transportation facilities.	05	CO3	L3												
18		What is Category analysis? Mention the assumptions made in category analysis.	05	CO4	L3												
19		What are the advantages and disadvantages of pre distribution modal split?	05	CO3	L3												
20		What is a Desire line diagram	05	CO3	L3												
21		Explain Gravity Models	05	CO4	L3												
22		Explain the Inventory of transportation facilities.	05	CO4	L3												
23		What is Category analysis? Mention the assumptions made in category analysis.	05	CO3	L3												
24		What is a Desire line diagram	05	CO3	L3												
25		Write short notes on Home based trip and non home based trip	05	CO3	L3												
26		Explain Growth factor method and Synthetic methods.	05	CO3	L3												
27		The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as	05	CO3	L4												

	<p>Zone Trip produced Trips attracted</p> <p>A 2000 3000</p> <p>B 3000 4000</p> <p>C 4000 2000</p> <p>It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.</p>			
28	List the methods of trip distribution & differentiate growth factor method with synthetic method	05	CO4	L3
29	What is the external cordon line? Explain the factors on which the selection of external cordon line depends	05	CO3	L3
30	Explain Growth factor method and Synthetic methods.	05	CO4	L3
31	Write short notes on Home Interview survey	05	CO3	L3
32	Write short notes on Commercial vehicle survey	05	CO3	L3
33	Explain the Inventory of transportation facilities.	05	CO3	L3
34	What is Category analysis? Mention the assumptions made in category analysis.	05	CO4	L3
35	What are the advantages and disadvantages of pre distribution modal split?	05	CO3	L3
36	What is a Desire line diagram	05	CO3	L3
37	Explain Gravity Models	05	CO4	L3
38	Explain the Inventory of transportation facilities.	05	CO4	L3
39	What is Category analysis? Mention the assumptions made in category analysis.	05	CO3	L3
40	What is a Desire line diagram	05	CO3	L3
41	Write short notes on Home based trip and non home based trip	05	CO3	L3
42	Explain Growth factor method and Synthetic methods.	05	CO3	L3
43	<p>The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as</p> <p>Zone Trip produced Trips attracted</p> <p>A 2000 3000</p> <p>B 3000 4000</p> <p>C 4000 2000</p> <p>It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.</p>	05	CO3	L4
44	List the methods of trip distribution & differentiate growth factor method with synthetic method	05	CO4	L3
45	What is the external cordon line? Explain the factors on which the selection of external cordon line depends	05	CO3	L3
46	Explain Growth factor method and Synthetic methods.	05	CO4	L3
47	Write short notes on Home Interview survey	05	CO3	L3
48	Write short notes on Commercial vehicle survey	05	CO3	L3
49	Explain the Inventory of transportation facilities.	05	CO3	L3
50	What is Category analysis? Mention the assumptions made in category analysis.	05	CO4	L3
51	What are the advantages and disadvantages of pre distribution modal split?	05	CO3	L3
52	What is a Desire line diagram	05	CO3	L3
53	Explain Gravity Models	05	CO4	L3
54	Explain the Inventory of transportation facilities.	05	CO4	L3
55	What is Category analysis? Mention the assumptions made in category analysis.	05	CO3	L3
56	What is a Desire line diagram	05	CO3	L3

57		Write short notes on Home based trip and non home based trip	05	CO3	L3												
58		Explain Growth factor method and Synthetic methods.	05	CO3	L3												
59		The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as <table border="1" style="margin-left: 20px;"> <tr> <td>Zone</td> <td>Trip produced</td> <td>Trips attracted</td> </tr> <tr> <td>A</td> <td>2000</td> <td>3000</td> </tr> <tr> <td>B</td> <td>3000</td> <td>4000</td> </tr> <tr> <td>C</td> <td>4000</td> <td>2000</td> </tr> </table> <p>It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.</p>	Zone	Trip produced	Trips attracted	A	2000	3000	B	3000	4000	C	4000	2000	05	CO3	L4
Zone	Trip produced	Trips attracted															
A	2000	3000															
B	3000	4000															
C	4000	2000															
60		List the methods of trip distribution & differentiate growth factor method with synthetic method	05	CO4	L3												
61		What is the external cordon line? Explain the factors on which the selection of external cordon line depends	05	CO3	L3												
62		Explain Growth factor method and Synthetic methods.	05	CO4	L3												
63		Write short notes on Home Interview survey	05	CO3	L3												
64		Write short notes on Commercial vehicle survey	05	CO3	L3												
65		Explain the Inventory of transportation facilities.	05	CO3	L3												
66		What is Category analysis? Mention the assumptions made in category analysis.	05	CO4	L3												

D3. TEACHING PLAN - 3

Module - 5

Title:	Trip Assignment	Appr Time:	16 Hrs
a	Course Outcomes	-	Blooms Level
-	The student should be able to:	-	
1	Assigning the trips by capacity restraint, all or nothing technique based on route properties, path building criteria	CO5	L4
b	Course Schedule		
Class No	Module Content Covered	CO	Level
1	Traffic Assignment: Diversion Curves; Basic Elements of Transport Networks	CO5	L4
2	Coding, Route Properties, Path Building Criteria	CO5	L4
3	Skimming Tree, All-or-Nothing Assignment	CO5	L4
4	Capacity Restraint Techniques, Reallocation of Assigned Volumes	CO5	L4
5	Capacity Restraint Techniques, Reallocation of Assigned Volumes	CO5	L4
6	Equilibrium Assignment	CO5	L4
7	Introduction to land use planning models	CO5	L4
8	Introduction to land use planning models, land use and transportation interaction.	CO5	L4
c	Application Areas	CO	Level
1	Transport Planning	CO5	L4
d	Review Questions	-	-
1	What is Traffic Assignment? Explain the applications of the traffic assignment.	CO5	L4
2	What are the Traffic Assignment Techniques? Explain the All or nothing	CO5	L4

	assignment technique.		
3	List the traffic assignment techniques and explain multiple route assignment	CO5	L4
4	What are the purpose of traffic assignment	CO5	L4
e	Experiences	-	-
1			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	10CV751	Sem:	VII	Marks:	30	Time:	75 minutes	
Course:	Urban Transportation and Planning							
-	-	Note: Answer any 1 FULL question from each part, all questions carry equal marks.				Marks	CO	Level
1	a	What is Traffic Assignment? Explain the applications of the traffic assignment.				07	CO5	L3
	b	Explain Path Building Criteria of Traffic Assignment?				08	CO5	L3
2	a	List the traffic assignment techniques and explain multiple route assignment				07	CO5	L3
	b	What are the purpose of traffic assignment				08	CO5	L3
3	a	What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.				07	CO5	L3
	b	Explain Basic Elements of Transport Networks				08	CO5	L3
4	a	Write a note on Skimming Tree technique				07	CO5	L3
	b	Discuss land use and transportation interaction				08	CO5	L3

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions								
Crs Code:	10CV751	Sem:	VII	Marks:	5 / 10	Time:	90 – 120 minutes	
Course:	Urban Transportation and Planning							
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.								
SNo	USN	Assignment Description				Marks	CO	Level
1		What is Traffic Assignment? Explain the applications of the traffic assignment.				05	CO5	L3
2		Explain Path Building Criteria of Traffic Assignment?				05	CO5	L3
3		List the traffic assignment techniques and explain multiple route assignment				05	CO5	L3
4		What are the purpose of traffic assignment				05	CO5	L3
5		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.				05	CO5	L3
6		Explain Basic Elements of Transport Networks				05	CO5	L3
7		Discuss land use and transportation interaction Write a note on Skimming Tree technique				05	CO5	L3
8		Write a note on land use planning models				05	CO5	L3
9		Write a note on Reallocation of Assigned Volumes				05	CO5	L3
10		What is Traffic Assignment? Explain the applications of the traffic assignment.				05	CO5	L3
11		Explain Path Building Criteria of Traffic Assignment?				05	CO5	L3
12		List the traffic assignment techniques and explain multiple				05	CO5	L3

		route assignment			
13		What are the purpose of traffic assignment	05	CO5	L3
14		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
15		Explain Basic Elements of Transport Networks	05	CO5	L3
16		Discuss land use and transportation interactionWrite a note on Skimming Tree technique	05	CO5	L3
17		Write a note on land use planning models	05	CO5	L3
18		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
19		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
20		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
21		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3
22		What are the purpose of traffic assignment	05	CO5	L3
23		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
24		Explain Basic Elements of Transport Networks	05	CO5	L3
25		Discuss land use and transportation interaction Write a note on Skimming Tree technique	05	CO5	L3
26		Write a note on land use planning models	05	CO5	L3
27		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
28		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
29		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
30		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3
31		What are the purpose of traffic assignment	05	CO5	L3
32		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
33		Explain Basic Elements of Transport Networks	05	CO5	L3
34		Discuss land use and transportation interactionWrite a note on Skimming Tree technique	05	CO5	L3
35		Write a note on land use planning models	05	CO5	L3
36		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
37		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
38		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
39		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3
40		What are the purpose of traffic assignment	05	CO5	L3
41		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
42		Explain Basic Elements of Transport Networks	05	CO5	L3
43		Discuss land use and transportation interactionWrite a note on Skimming Tree technique	05	CO5	L3
44		Write a note on land use planning models	05	CO5	L3
45		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
46		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
47		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
48		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3
49		What are the purpose of traffic assignment	05	CO5	L3
50		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
51		Explain Basic Elements of Transport Networks	05	CO5	L3
52		Discuss land use and transportation interactionWrite a note on Skimming Tree technique	05	CO5	L3

53		Write a note on land use planning models	05	CO5	L3
54		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
55		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
56		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
57		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3
58		What are the purpose of traffic assignment	05	CO5	L3
59		What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	05	CO5	L3
60		Explain Basic Elements of Transport Networks	05	CO5	L3
61		Discuss land use and transportation interaction Write a note on Skimming Tree technique	05	CO5	L3
62		Write a note on land use planning models	05	CO5	L3
63		Write a note on Reallocation of Assigned Volumes	05	CO5	L3
64		What is Traffic Assignment? Explain the applications of the traffic assignment.	05	CO5	L3
65		Explain Path Building Criteria of Traffic Assignment?	05	CO5	L3
66		List the traffic assignment techniques and explain multiple route assignment	05	CO5	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:	Urban Transportation and Planning				Month / Year	JAN /2019		
Crs Code:	15CV751	Sem:	VIII	Marks:	80	Time:	180 minutes	
-	Note	Answer all FIVE full questions. All questions carry equal marks.				Marks	CO	Level
1	a	Explain Scope of Urban transport planning				08	CO1	L2
	b	Define Transport Planning. Explain the "Interdependence of land use and traffic"				08	CO1	L2
		OR						
-	a	What is the necessity of urban transport planning				08	CO1	L2
	b	Define "Zone". Mention the different factors considered in dividing the whole area of to zones.				08	CO1	L2
		OR						
2	a	Explain travel demand and its categories in urban transport				08	CO2	L3
	b	Explain the average growth factor method with equation				08	CO2	L3
		OR						
-	a	List out the assumptions and disadvantages of Uniform Growth factor method				08	CO3	L2
	b	Define furness method of Trip Distribution with equation				08	CO2	L2
		OR						
3	a	Explain Growth factor method and Synthetic methods.				07	CO3	L3
	b	The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as Zone Trip produced Trips attracted A 2000 3000 B 3000 4000 C 4000 2000 It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.				09	CO3	L3
		OR						
-	a	List the methods of trip distribution & differentiate growth factor method				06	CO3	L3

		with synthetic method			
	b	Write short notes on Home based trip and non home based trip	05	CO3	L3
	c	What is the external cordon line? Explain the factors on which the selection of external cordon line depends	05	CO3	L3
4	a	Explain the Inventory of transportation facilities.	08	CO4	L4
	b	What is Category analysis? Mention the assumptions made in category analysis.	08	CO4	L4
		OR			
-	a	What are the advantages and disadvantages of pre distribution modal split?	07	CO4	L4
	b	What is a Desire line diagram	03	CO4	L4
	c	Explain Gravity Models	06	CO4	L4
5	a	What is Traffic Assignment? Explain the applications of the traffic assignment.	08	CO5	L4
	b	What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	08	CO5	L4
		OR			
	a	Explain Multiple route assignment with equation	08	CO5	L4
	b	What are the purpose of traffic assignment	08	CO5	L4

2. SEE Important Questions

Course:	Urban Transportation and Planning				Month / Year	JAN /2019	
Crs Code:	15CV751	Sem:	VIII	Marks:	80	Time:	180 minutes
	Note	Answer all FIVE full questions. All questions carry equal marks.				-	-
Module	Qno.	Important Question			Marks	CO	Year
1	1	Explain the Inventory of transportation facilities.			07	CO1	2014
	2	What is Category analysis? Mention the assumptions made in category analysis.			06	CO1	2013
	3	What are the advantages and disadvantages of pre distribution modal split?			07	CO1	2014
	4	What is a Desire line diagram			03	CO1	2016
	5	Explain Gravity Models			08	CO1	2008
2	1	Explain the Inventory of transportation facilities.			08	CO2	2008
	2	What is Category analysis? Mention the assumptions made in category analysis.			08	CO2	2010
	3	Explain with flow chart the stages of transport planning			08	CO2	2015
	4	Write short notes on Home based trip and non home based trip			08	CO2	2016
	5	Explain Growth factor method and Synthetic methods.			08	CO2	2014
3	1	Explain Growth factor method and Synthetic methods.			06	CO3	2016
	2	The total trips produced and attracted to the three zones A, B and C of a survey area in the design year are tabulated as Zone Trip produced Trips attracted A 2000 3000 B 3000 4000 C 4000 2000 It is known that the trips between two zones are inversely proportional to the second power of the travel time between zones, which is uniformly 20min. If the trip interchange between zones B & C is known to be 600, calculate the trip interchange between zones A & B, A & C, B and A, C and B.			08	CO3	2017

	3	List the methods of trip distribution & differentiate growth factor method with synthetic method	08	CO3	2013
	4	Write short notes on Home based trip and non home based trip	08	CO3	2016
	5	What is the external cordon line? Explain the factors on which the selection of external cordon line depends	08	CO3	2017
4	1	Explain the Inventory of transportation facilities.	08	CO4	2017
	2	What is Category analysis? Mention the assumptions made in category analysis.	08	CO4	2016
	3	What are the advantages and disadvantages of pre distribution modal split?	08	CO4	2016
	4	What is a Desire line diagram	08	CO4	2017
	5	Explain Gravity Models	08	CO4	2016
5	1	What is Traffic Assignment? Explain the applications of the traffic assignment.	08	CO5	2010
	2	What are the Traffic Assignment Techniques? Explain the All or nothing assignment technique.	08	CO5	2015
	3	List the traffic assignment techniques and explain multiple route assignment	08	CO5	2016
	4	What are the purpose of traffic assignment	08	CO5	2017

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Blooms' Level	Identified Action Verbs for Learning	Instruction on Methods for Learning	Assessment Methods to Measure Learning
A	B	C	D	E	F	G	H
1	Urbanization, urban class groups, transportation problems and identification, impacts of transportation, urban transport system planning process, modeling techniques in planning. Urban mass transportation systems: urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, capacity, merits and comparison of systems, coordination, types of coordination.	08	- L1 - L2	L2	Analyze	Lecture	Internal Test Assignment
2	Collection of data – Organisation of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use of Secondary Sources, Economic data – Income – Population – Employment – Vehicle Ownership.	08	- L2 - L3	L3	Conduct	- Lecture - -	Internal Test Assignment
3	UTPS Approach, Trip Generation Analysis: Zonal Models, Category Analysis, Household Models, Trip Attraction models, Commercial Trip Rates; Trip Distribution by Growth Factor Methods	08	- L3 - L4	L4	Determine	- Lecture -	Internal Test Assignment

4	Gravity Models, Opportunity Models, Time Function Iteration Models. Travel demand modeling: gravity model, opportunity models, Desire line diagram. Modal split analysis, problems	08	- L3 - L4	L4	Distribute	- Lecture -	Internal Test Assignment
5	Diversion Curves; Basic Elements of Transport Networks, Coding, Route Properties, Path Building Criteria, Skimming Tree, All-or-Nothing Assignment, Capacity Restraint Techniques, Reallocation of Assigned Volumes, Equilibrium Assignment. Introduction to land use planning models, land use and transportation interaction.	08	- L3 - L4	L4	Assign	- Lecture -	Internal Test Assignment

2. Concepts and Outcomes:

Table 2: Concept to Outcome – Example Course

Module #	Learning Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome Student Should be able to ...
A	I	J	K	L	M	N
1	Analyzing the planning process required by Identifying different transport system for different category of traffic	Transport planning	Transport planning	It involves understanding of various transport systems in an urban area and analyzing the planning process required for different category of traffic like mass transit systems and rapid transit system	Analyze the planning process transport system different category of traffic	Analyze the planning process required by Identifying different transport system for different category of traffic
2	Conducting traffic surveys to provide the data required for transportation planning	Collection of data Organisations of surveys and Analysis	Data Collection	Collecting the traffic data from different sources like Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques and Analysis of survey	Conduct traffic surveys data required transportation planning	Conduct traffic surveys to provide the data required for transportation planning
3	Determining the trips generated using trip model methods for specific type of landuse development	-	Trip Generation	Trip Generation Analysis by Zonal Models, Category Analysis, Household Models, Trip Attraction models, Commercial Trip Rates Distribution of Trip	Determine trips generated trip model methods specific type of landuse development	Determine the trips generated using trip model methods for specific type of landuse development

				by Growth Factor Method		
4	Distributing the trips by- considering the travel demand modeling, desire line diagram for generated trips	-	Trip Distribution	Distribution of Trip after analyzing the travel demand modeling, Desire line diagram by Gravity Models, Opportunity Models, Time Function Iteration Models.	Distribute the trips travel demand desire line diagram generated trips	Distribute the trips by considering the travel demand modeling, desire line diagram for generated trips
5	Assigning the trips by- capacity restraint, all or nothing technique based on route properties, path building criteria	-	Traffic Assignment	Assigning the trip depending on route properties, Path Building Criteria by techniques like All-or-Nothing Assignment, Capacity Restraint Technique	Assigning the trips capacity restraint, all or nothing technique route properties, path building criteria	Assigning the trips by capacity restraint, all or nothing technique based on route properties, path building criteria