Kolhapur Institute of Technology's

COLLEGE OF ENGINEERING, KOLHAPUR (EMPOWERED AUTONOMOUS)

Gokul Shirgaon, Kolhapur

KOLHAPUR INSTITUTE OF TECHNOLOGY'S
COLLEGE OF ENGINEERING KOLHAPUR
(EMPOWERED AUTONOMOUS)

Curriculum Structure
For
B. Tech. Honors in Civil Engineering
STRATEGIC CIVIL INFRASTRUCTURE

Academic Year 2025-2026

Under Graduate Programme

Approved in BoS on 15.03.2025
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Title of the Course:	URBAN TRANSPORTATION SYSTEMS PLANNING	L	T	P	Credit
Course Code:	UCVHN0551	3	1	-	4

Course Pre-Requisite:

Students shall have the knowledge of:

1. To enable the students to develop the mass transportation systems
2. Engineering knowledge
3. Problem analysis

Course Description:

This course provides the basic concepts and skill sets to undertake urban land use and transportation planning and to analyze the impact of various policies either related to infrastructure development, environmental regulation and urban expansion.

Course Learning Objectives:

1. Understand and apply basic concepts and methods of urban transportation planning.
2. Apprise about the methods of designing, conducting and administering surveys to provide the data required for transportation planning.
3. Understand the process of developing an organized mathematical modelling approach to solve select urban transportation planning problem.
4. Excel in use of various types of models used for travel forecasting, prediction of future travel patterns.

Course Outcomes:

CO	After the completion of the course the student should be able to	Bloom's Cognitive	
		Level	Descriptor
CO1	Explain the history, trends, and impacts of urbanization and transportation problems in urban areas.	2	Understand
CO2	Design and conduct transportation surveys and analyze collected data for planning purposes.	3,4	Apply and Analyze
CO3	Develop trip generation and distribution models, and analyze modal split using travel forecasting techniques.	3,4	Apply and Analyze
CO4	Evaluate and recommend suitable traffic assignment methods and validate transportation models for urban corridors	5	Evaluate

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2		1			3	3	0	2		2
CO2	3	2	2	3	3	2		3	1		2
CO3	3	3	2	1	3	2		1		1	2
CO4	2	3	2	3	3	2			2	1	2

CO	PSO1	PSO2	PSO3
CO1	1	1	3
CO2	3	2	3
CO3	2	2	2
CO4	2	3	2

Assessments :

Teacher Assessment:

- **ESE:** Assessment is based on the End Semester Examination on 100% course content

Assessment	Marks
ESE	100

Course Contents:

Unit-1	CO:1	
History of Urbanization: Urbanization, urban class groups, transportation problems and identification, impacts of transportation, Urban transport system planning process		**06 Hrs.**
Unit-2	**CO:1**	
Urban transport planning: Interdependence of the land use and traffic ,systems approach to Transport planning, stages in Transport planning, Urban mass rail transportation systems: urban transit problems, travel demand, Bus rail transit systems, coordination, types of coordination.		**07 Hrs.**
Unit-3	**CO:2**	
Data Collection And Inventories: Collection of data – Organization of surveys and		**08 Hrs.**

Analysis, Study Area, Zoning, Types and Sources of Data, Home interview surveys, Commercial vehicle surveys, taxi surveys, Road Side Interviews, Tag on vehicles, Public transport surveys, Inventory of transport facilities		
Unit-4	**CO:3**	
Trip Generation: Introduction and definitions, Trip purpose, UTPS Approach, Trip Generation Analysis: Zonal Models, Category Analysis, Household Models, Trip Attraction models, Commercial Trip Rates		**07 Hrs.**
Unit-5	**CO:3**	
Trip Distribution and mode choice: Trip Distribution by Growth Factor Methods. Problems on above. Gravity Models, Opportunity Models, Time Function Iteration Models. Travel demand modeling: gravity model, opportunity models, Desire line diagram. Factors affecting modal split, recent developments in Modal split analysis.		**09 Hrs.**
Unit-6	**CO:4**	
Traffic Assignment: Purpose of Traffic assignment, General principles, Assignment techniques, Basic Elements of Transport Networks, Coding, Route Properties, Path Building Criteria, Skimming Tree, All-or-Nothing Assignment, Multiple route assignment, Capacity Restraint assignment, Assignment Diversion Curves		**08 Hrs.**

Recommended Textbooks:

1. Kadiyali. L. R., 'Traffic Engineering and Transportation Planning', Khanna Publishers, New Delhi.
2. Hutchinson, B.G, 'Introduction to Urban System Planning', McGraw Hill.
3. Khisty C.J., 'Transportation Engineering – An Introduction' Prentice Hall.
4. Papacostas, 'Fundamentals of Transportation Planning', Tata McGraw Hill

References Books:

1. Vuchic V.R., Urban Public Transportation System and Technology, Prentice Hall, Inc. Englewood Cliffs, New Jersey, (1981).
2. Agarwal M.K., Urban Transportation in India, INAE, Allied Publishers Ltd., (1996).
3. Grey G.E. & Hoel , L. A., Public Transportation, Prentice Hall, Englewood Cliffs, N.J. (1992).
4. Mayer M and Miller E, 'Urban Transportation Planning: A decision oriented Approach', McGraw Hill.
5. Bruton M.J., 'Introduction to Transportation Planning', Hutchinson of London.
6. Dicky, J.W., 'Metropolitan Transportation Planning', Tata McGraw Hill.

Title of the Course:	AVIATION INFRASTRUCTURE AND FACILITY PLANNING	L	T	P	Credit
Course Code:	UCVHN0651	3	1	-	3

Course Pre-Requisite:

Students shall have the knowledge of: Engineering knowledge, Problem analysis, Interpretation of data.

Course Description:

The module introduces the Airport planning issues along with the designing of Runway. The visual aids required from Airport Traffic operating are dealt with. The necessary inputs required for efficiency drainage system has significance in maintenance the airport.

Course Learning Objectives:

1. Understand and apply basic concepts and methods of urban transportation planning.
2. Apprise about the methods of designing, conducting and administering surveys to provide the data required for transportation planning.
3. Understand the process of developing an organized mathematical modelling approach to solve select urban transportation planning problem.
4. Excel in use of various types of models used for travel forecasting, prediction of future travel patterns.

Course Outcomes:

CO	After the completion of the course the student should be able to	Bloom's Cognitive	
		Level	Descriptor
CO1	Describe the different components of airport and aircrafts.	2	Understand
CO2	Explain the airport runway	2	Understand
CO3	Analyse the requirements of an airport layout with respect to international regulations	4	Analyze
CO4	Design Taxiways & Aprons, Summarise the concepts of the terminal service facilities.	6	create

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	0	0	0	0	0	0	1	0	1
CO2	2	3	2	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3

CO	PSO1	PSO2	PSO3
CO1	0	0	2
CO2	3	3	3
CO3	3	3	3
CO4	3	3	3

Assessments :

Teacher Assessment:

- **ESE:** Assessment is based on the End Semester Examination on 100% course content

Assessment	Marks
ESE	100

Course Contents:

Unit-1	**CO:1**	
Air Transportation Airport terminology, component parts of Aeroplane, Classification and size of airports; Aircraft characteristics. Air traffic control need for ATC, Air traffic control network, Air traffic control aids –enroute aids, landing aids. Airport site location and necessary surveys for site section, airport obstructions.		**08 Hrs.**
Unit-2	**CO:2**	
Planning Airport master plan –FAA recommendations, Regional Planning, ICAO recommendations, Estimation of future airport traffic needs-layout of Air Port		**07 Hrs.**
Unit-3	**CO:3**	
Runway orientation windrose diagram, basic runway length, corrections for elevation, temperature and gradient, runway geometric design, runway pavement design introduction.		**08 Hrs.**

Unit-4	**CO:3,4**	
Taxiways and Aprons Loading aprons –holding aprons –Geometric design standards, exit taxiways –optimal location, design, and fillet and separation clearance, Airport Zones,		**08Hrs.**
Unit-5	**CO:4**	
Other facilities Passenger Facilities and Services, Lighting, visual airport marking, airport lighting aids.		**07 Hrs.**
Unit-6	**CO:4**	
Operations and Scheduling Ground transportation facilities; Airport capacity, runway capacity and delays.		**07 Hrs.**

Recommended Textbooks:

1. Khanna S.K., Arora M.G., Jain S.S., "Airport Planning & Design",1st Edition, Nemch and Bros. Roorkee, 2009.
2. Robert Horonjeff, Francis Mc Kelvey, William Sproule and Seth Young, "Planning and Design of Airports" 5th Edition, 2010.

References Books:

1. Heronjeff, R, Mc Kelvey, F.X, "Planning & Design of Airports", 2 nd Edition, Mc Graw Hill Book Co, 1994.
2. Norman J. Ashford, Saleh Mumayiz and Paul H. Wright, "Planning, Design and Development of 21st Century Airports", 4th Edition, John Wiley &Sons, 2011.
3. Subramian K.P., "Highway, Railway, Airport and Harbour Engineering", 1st Edition, Scitech Publications Private Limited, 2013.
4. Alexander T. Wells, Ed. D & Seth, B. Young, "Airport Planning and Management', 5th Edition, 2008