Semester- I

HABITAT DESIGN STUDIO-I (COMMUNITY LEVEL STUDY OF EXISTING HABITATS)			
Course Code	MAHD101	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	1:5:1	SEE Marks	50
Total Hours of Pedagogy	6	Total Marks	100
Credits	6	Exam Hours	-

Course Learning objectives:

- The Habitat Design Studio aims at studying and understanding the fabric of an existing habitat and realize the determinants and causative forces responsible for urban growth and change.

Studio Outline

To comprehend the dynamics of an existing habitat at community level.

1. Study and documentation of identified study area.
   - Geographic parameters- site environment, topography, climate, natural and manmade features.
   - Social environment- Society, Community, Groups. Social Structure & Institutions- continuity and change.
   - Demographic analysis, Economic profile of the population.
   - Spatial Morphology- Land use, Transport networks, Building typology.
   - Physical & Social Infrastructure.
   - Institutional Framework.
2. Data Analysis and Inferences.
   - The syntax of space.
   - Traffic management and Mobility plans.
   - Tangible, Intangible aspects of the habitat.
   - Aspects of Temporality and Informality.
   - Aspects of Human networks, Associational Values, Social segregation, Overcrowding, Contested Spaces, Crime and Gender issues.
   - Imageability-through the perspective of various urban theorists.
3. Interventions
   - Strategies to be proposed for the study area in response to the inferences drawn.
   - Any one of the suggested strategies to be demonstrated through design.
   - Any other salient features relevant to the identified study area to be considered.

Integrated Studio Course (ISC)

1. Social Theories of Urban Space- Understanding and Studying Urban habitats; and Various techniques.
2. Using crowd Sourced data and GIS to generate relevant maps for the studio.

Assessment Details (both CIE and SEE)

For Professional Studio Core Course Integrated with the theories/software relating to the studio. The theory part of the ISC shall be evaluated by CIE with regular assignment. The studio part shall be evaluated by both CIE & SEE (Viva-Voce with the external examiner).

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Continuous Internal Evaluation will be based on

1. Seminars, Assignments, and Studio Discussions for ISC component.
2. Two Internal Reviews, two External Reviews and Final Portfolio Submission for Studio component.

Semester End Examination:

Viva-voce: The viva voce shall be conducted in two phases, firstly for the group work followed by Viva Voce for individual interventions, considering the weightage ratio of 70:30.

Suggested Learning Resources:

Books

1. Cliff Moughtin, "Urban Design: Street and Square", Architectural Press, 2003.
2. Gehl, J,"Life Between Buildings: Using Public Space",Washington, D.C. Island Press,2011.
3. Michael Larice (Editor), Elizabeth Macdonald (Editor), "The Urban Design Reader" Routledge, 2013.

Web links and Video Lectures (e-Resources):

1. https://link.springer.com/chapter/10.1007/978-3-030-59140-3_7
2. https://library.oapen.org/handle/20.500.12657/50404

Skill Development Activities Suggested:

1. Skills to identify parameters and reading the Habitat.
2. Preparing Questionnaire formats for Survey.
3. Representation of data related to Habitat through thematic Maps.
4. Analytical abilities to evaluate issues related to Habitat.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Identify components of human habitat	IV
CO2	Generate systematic method of data collection and documentation of habitat	V
CO3	Analyse issues related to human habitat	VI
CO4	Generate strategies for identified Habitat related issues	VI
CO5	Develop design interventions for existing fabric	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Ability to read the habitat	1, 9
2	Ability to identify the components of the human habitat	2, 3
3	Documentation of human habitats	2, 3, 7, 9
4	Generate strategies and design solutions	4, 5, 6

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	3	2	-	-	1	1	3	1
CO2	3	3	2	2	-	-	-	-	3	2
CO3	2	3	3	1	-	1	2	2	3	2
CO4	2	2	3	2	3	2	2	2	-	1
CO5	1	2	2	2	3	2	2	2	-	2
Average	**2**	**2.6**	**2.6**	**1.8**	**1.2**	**1**	**1.4**	**1.4**	**1.8**	**1.6**

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology / Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	-

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HUMAN HABITAT: THEORIES AND DESIGN THOUGHT			
Course Code	MAHD102	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:1:0	SEE Marks	50
Total Hours of Pedagogy	04	Total Marks	100
Credits	04	Exam Hours	03

Course Learning objectives:

- To introduce the students to theories, concepts and components of human habitat, its determinants, methods of study.
- To gain exposure and understand the Design theories and their impact on cities.

Module-1

HUMAN HABITAT AND ITS DETERMINANTS

- Components of Human Habitat.
- Socio economic, Cultural and Historic determinants of urban growth and urban form.
- Idea as determinant –City as Patterns, Diagrams and Spaces.
- Evolution of cities and towns in India.

Module-2

URBAN FORM AND READING THE HABITAT

- Urban design vocabulary: Urban grid, Grain, texture, scale, spaces, massing, enclosure.
- Reading the urban form through various dimension, experience and behavioural aspects.
- Environmental perception, cognition, cognitive and mental maps, Image of towns and cities.

Module-3

URBAN DESIGN MOVEMENTS AND THEORIES

- Modernism, Postmodernism, structuralism and post structuralism, ideas of self-similarity and fractals, neoclassicism, revivalism and its impact on habitats.
- Theory of urbanism: Modernization & Urban Development through national and International Perspectives.
- New Urbanism and everyday Urbanism – Introduction, tools and strategies.
- Postmodern Urbanism: Contextualism.

Module-4

APPROACHES TO STUDY HUMAN HABITAT

- Concepts and Theories of urban form: Imageability, Perception, townscape, and elements of urban design (Gordon Cullen, Kevin Lynch). Introduction to Utopian concepts.
- Social theories of urban space - Social Life of Small Urban Spaces by William Whyte, Life Between Buildings by Jan Gehl, Life and death of American cities by Jane Jacobs and Karl Marx theories.

Module-5

LAYERING IN A HABITAT

- Layering in a habitat: Organic habitats and designed habitats. Historic core and contemporary urbanism. Study of Ideas of historic layering of space and networks, Lattices v/s trees as urban structural metaphors.
- Urban Social Movement in India and their impacts on habitat evolution.
- Habitat Design, Urban Design and their relationship with planning and architecture.
- Role of Habitat Designer.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

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Continuous Internal Evaluation:

1. Two Unit Tests each of 25 Marks.
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and Pos.

The sum of two tests, two assignments/skill Development Activities, will be scaled down to 50 marks
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module.

Suggested Learning Resources:

Books

1. Kevin Lynch, "Imageability of City", The MIT Press, 1960.
2. Camillo Sitte, "City Planning according to Artistic principles", Phaidon Press, 6th Edition, 1965.
3. Kevin Lynch, "Good City Form", The MIT Press, Reprint Edition, 1984.
4. Rob Krier, "Urban Street and Squares", Architectural Press, 3rd Edition, 2003.
5. Gordon Cullen, "Townscapes", Architectural Press, 1st Edition, 1961.
6. Donald Watson, "Time-Savers Standards for Urban Design", McGraw Hill Education, 2017
7. Jan Gehl, Cities for People, Island Press, 2010
8. Jon Lang, "Creating Architectural Theory", John Wiley & Sons, 2nd edition, 1987. 2. Jon Lang, "UrbanDesign", Architectural Press, 2nd edition, 2017. 3. Kate Nesbit, "Theorizing a New Agenda for Architecture", 2nd edition, 1996. 4. Geoffrey Broadbent, Richard Bunt and Charles Jencks, "Signs, Symbols and Architecture", JohnWiley & Sons, 1st edition-1980.
9. S. Kostoff. (1991), "The City Shaped. London", Thames and Hudson

Web links and Video Lectures (e-Resources):

1. https://www.jstor.org/stable/40315538
2. https://iopscience.iop.org/article/10.1088/1755-1315/764/1/012033
3. https://www.jstor.org/stable/23286055
4. http://www.petkovstudio.com/bg/wp-content/uploads/2017/03/Urban-design-reader-by-MatthewCarmona-and-Steven-Tiesdell.pdf
5. https://www.gehlpeople.com
6. https://www.research-collection.ethz.ch/bitstream/handle/20.500.11850/113477/eth-48691-01.pdf

Skill Development Activities Suggested

1. Analysing cities and their components through case-studies.
2. Analysis of Urban projects concerning public spaces, transport nodes and other important components of the public realm.
3. Applying Cognitive Mapping as an important Tool in reconnaissance survey of site area.
4. Evaluating impact of various Urban Theories on Urban Form.
5. Role played by NGOs with respect to issues concerning habitat.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Identify, read and understand components of human habitat	IV
CO2	Familiarization of theoretical approaches related to habitat design	II
CO3	Comprehend the determinants which define urban form	VI
CO4	Rationalizing the role of habitat designers	V
CO5	Analyse and interpret the evolution of Human habitat in India	VI

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Program Outcome of this course

Sl. No.	Description	Pos
1	Identifying important components of a habitat	1,2
2	Evaluate components of habitat systems and understand the complex layers of habitat systems	1,3,7,8
3	Familiarization with the existing knowledge base with respect to habitat systems	1,2,7,8
4	Recognize significance of the program and role of various stakeholders to address contemporary habitat issues	2,4,7,8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	-	-	-	3	2	-	-
CO2	2	3	2	-	-	-	-	1	-	-
CO3	3	3	2	-	-	2	3	3	-	2
CO4	-	-	-	3	-	2	3	3	2	2
CO5	1	3	-	-	-	-	3	1	-	2
Average	1.8	2.2	1.2	0.6	0	0.8	2.4	2	0.4	1.2

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	–

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PLANNING THEORY AND TECHNIQUES			
Course Code	MAHD103	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:0:1	SEE Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	03

Course Learning objectives:

- To introduce the concepts and approaches of planning and execution.
- To stimulate the problem-solving skills at the planning level using diverse silks and approaches.
- To familiarize the students with the organisational structure, systems, financial planning, and management.

Module-1

INTRODUCTION TO PLANNING

- Planning terms and definitions. Aims and Objectives of Physical Planning.
- Basic principles of settlement planning and components of settlement structure.
- Theories of City Development and Planning Theories: Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories.
- Models of planning: Advocacy and Pluralism in Planning; Systems approach to planning: rationalistic and incremental approaches, mixed scanning and middle range planning; Equity planning; Political Economy.

Module-2

PLANNING LEGISLATIONS AND NEW APPROACHES TO CITY PLANNING

- Planning legislations and Legal framework in India, Regulations, Byelaws, Standards and Norms and their basis.
- Model Town Planning Laws. Town Planning Acts in different states of India; Study of different state Acts and its implications.
- New city planning approaches- Growth management strategies, Transit-oriented Development, Zoning Mechanisms.
- Participatory Planning Approaches.

Module-3

PLANNING METHODS

- Analytical Methods: Classification of regions, delineation techniques of various types of regions.
- Land suitability analysis, network analysis; Threshold analysis; Input output analysis, SWOT analysis.
- Demographic Methods: Methods of population forecasts and projections; urban – rural, urban concentration, metropolitan concentration; Location dimensions of population groups – social area and strategic choice approach – interconnected decision area analysis.

Module-4

RESOURCE MOBILISATION AND IMPLEMENTATION MECHANISM OF PHYSICAL PLANS

- Urban Development Plans: Types, scope, purpose, and content. Regional, Metropolitan, Master, Zonal or Local plans. Approaches to preparation of Interim and Comprehensive Plans: Structure Plan, Perspective Plan, Master Plan.
- Implementation techniques – Financial planning, schemes and programs, organizational structure.
- Provisions of the plan implementation through the Act- Town Planning Schemes, Land Acquisition, Land Pooling and Transferrable Development Rights (TDR)

Module-5

TECHNIQUES FOR DATA COLLECTION, SURVEY, MAPPING AND ANALYSIS

- Land use classification or coding and expected outputs; Techniques of preparing base maps including understanding the concepts of scales, components and detailing for various levels.
- Methods of collecting various data through primary and secondary sources. Sources of various data in India.
- Familiarization of techniques- Field Surveys, Questionnaire Design, Sampling and digital mode of data collection.
- Data Analysis and presentation techniques.

Assessment Details (both CIE and SEE)

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Continuous Internal Evaluation:

1. Two Unit Tests each of 25 Marks.
2. Two assignments each of 25 Marks or one Skill Development Activity of 50 marks to attain the COs and POs.

The sum of two tests, two assignments/skill Development Activities, will be scaled down to 50 marks.
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:

Books

1. Arthur Gallion, "Urban Pattern", John wiley & Sons; 5th Edition, 2003.
2. Siddhartha N.Mukherjee, "Cities -Urbanization and Urban System", Kitab Mahal, 12th Edition, 2017.Peter Hall,
3. "Urban and Regional Planning", Routledge, 5th edition, 2010.
4. K.P.Yadav, "Vol 1-5- Encyclopedia of Economic Planning and Development", Ivy Publishing House.
5. Abir Bandyopadhyay, "Text Book of Town Planning", Books and Allied Ltd, 2000.

Web links and Video Lectures (e-Resources):

1. https://www.jstor.org/stable/3517133
2. https://www.youtube.com/watch?v=NvHsD4GyCAw
3. https://www.youtube.com/watch?v=IK0_CY499Kg
4. https://www.youtube.com/watch?v=k2_wuThLG6o
5. https://www.youtube.com/watch?v=goC4R9oF3Eo
6. https://onlinecourses.nptel.ac.in/noc21_ar12/preview
7. https://www.youtube.com/watch?v=wUEOFGs8ZdE
8. https://iopscience.iop.org/article/10.1088/1757-899X/603/2/022003

Skill Development Activities Suggested

1. Research paper on land use-oriented techniques such as land suitability analysis, network analysis, population projection etc.
2. Critical analysis of live planning projects which highlights implementation process, organization structure and resource mobilization.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Understand basic terminologies and approaches followed globally.	I
CO2	Understand and Analyse Planning legislations and planning process in the country	II
CO3	Understand basic analysis methods	II
CO4	Contextualize resource mobilization and implementation techniques	III
CO5	Evaluate and apply appropriate Data collection and survey Techniques for Planning	V

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Program Outcome of this course

Sl. No.	Description	POs
1	Familiarisation with Planning legislations and regulations which determine the characteristics of Habitats.	1,2,3
2	Critically evaluate and analyse the impact of Planning on Habitats.	2,3,7,8
3	Use of Appropriate survey and sampling techniques based on Research Area.	3,4,9,10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	2	1	-	-	-
CO3	2	3	3	-	-	-	3	3	3	1
CO4	1	3	3	--	-	-	-	-	3	3
CO5	-	-	3	3	3	3	-	-	3	1
Average	1.8	2	2.2	0.6	0.6	1	0.8	0.6	1.8	1

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	_

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SOCIOLOGY, CULTURE AND HUMAN HABITAT			
Course Code	MAHD104	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	0:3:0	SEE Marks (TW)	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:

- To understand the theoretical frameworks and concepts in sociology relevant to the study of human habitats.
- To analyse the dynamics of cultural practices and social structures in shaping human environments.
- To critically evaluate the impacts of urbanization and Socio-Cultural degradation on human habitats.
- To explore strategies for sustainable development and community resilience.

Module-1

EVOLUTION OF URBAN SOCIOLOGY

- Introduction to Urban Sociology.
- Theories of Urban Sociology- Emile Durkheim, Georg Simmel, Max Weber, Louis Wirth
- Overview of Sociological perspectives on human habitats

Module-2

SOCIO-CULTURAL ELEMENTS OF A HABITAT

- Society, Community, Caste, Kinship, Family, Culture, Social Institutions, Religious and Spiritual Beliefs. Identity.
- Social Behaviour and relationships of individuals within the habitat and social dynamics in urban areas, Social Stratification and Networks.
- Significance of culture and its impact on the physical environment.

Module-3

DEMOGRAPHIC CHARACTERISTICS

- Attributes of a population that provide insights into its composition, distribution and trends.
- Demographic Transition and its influence on the physical environment.
- Characteristics of communities- Homogeneity & Heterogeneity, Ethnic enclaves, social cohesion, social segregation.
- Symbiotic relations of communities.

Module-4

SOCIAL INSTITUTIONS AND MIGRATION

- Urbanization- Impact and Implications.
- Evolution and significance of Social Institutions in urban settings.
- Migration Patterns- Social Disorganization, alienation, Concerns of Privacy, and Identity.
- Examination of the concept of the neighbourhood through the understanding of socio-cultural aspects.

Module-5

URBAN SOCIAL PROCESSES

- Social implications of Gentrification, Neo-liberalization, Globalization.
- Other Issues- Crime, Gendered Urban Spaces, Contested Spaces.
- Demonstration of social processes and conditions through illustrations.

Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

Continuous Internal Evaluation will be based on Assignments, Seminar and Final Portfolio Submission.

Semester End Examination:

- The student needs to submit his/her works done throughout the semester, for Term work examination, atleast one day prior to Term Work Examination to the course teacher/coordinator.
- The term work will be evaluated by an external teacher appointed by the University along with Course teacher or an internal examiner.

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- The SEE mark list generated is to be signed by both internal and external examiners and submitted to VTU in sealed cover through the principal of the institution.

Suggested Learning Resources:

Books

1. Amos Rapoport, "House form and culture", Pearson Education
2. Jan and Mele, "The Urban Sociology Reader", Routledge, 2012.
3. William Flanagan, "Contemporary Urban Sociology", Cambridge University Press, 1993.
4. Henri Lefebvre, Eleonore Kofman (Editor), Elizabeth Lebas (Editor), "Writings on Cities", Wiley, 1996.
5. Mark Gottdiener, Ray Hutchison, "The New Urban Sociology", Westview Press, 2010.
6. Neil Brenner, Peter Marcuse, Margit Mayer, "Cities for People, Not for Profit: Critical Urban Theory and the Right to the City", Routledge, 2011

Web links and Video Lectures (e-Resources):

1. https://nptel.ac.in/courses/109104074
2. https://researchdirectory.uc.edu/p/russelfp
3. https://www.nature.com/articles/srep10265
4. https://www.jstor.org/stable/43630965
5. https://www.jstor.org/stable/23618928
6. https://www.tandfonline.com/doi/full/10.1080/07352166.2016.1255526
7. https://www.gacbe.ac.in/images/E%20books/Culture%20and%20every%20day%20life%20.pdf

Skill Development Activities Suggested

1. On-site study to observe and analyse social dynamics, cultural practices, and human habitats.
2. Analysing and evaluating policies or urban development plans from a sociological perspective.
3. Generate social survey formats.
4. Interpret the demographic characteristics of the identified study area in Habitat Design Studio-I.
5. Recognise the social processes through case-studies.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Key terms related to urban sociology, culture and human habitats	I
CO2	Understand relationship between social institutions and human habitats	II
CO3	Identify the social and cultural elements organising human habitat	II
CO4	To analyse urban social theories in urban development project	III
CO5	Analyse spatial implications of social processes	IV
CO6	Interpreting human habitat through its socio-cultural characteristics	V

Program Outcome of this course

Sl. No.	Description	POs
1	Understand sociological concepts and theories of human habitats	1, 2, 3, 6, 7, 8
2	Identify the influence of social patterns defining spatial patterns	1, 2, 3
3	Methods to analyse and evaluate the social dimensions in Human Habitat	2, 3, 4, 7, 10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	**2**	**3**	**3**	**1**	**-**	**2**	**3**	**1**	**-**	**3**
CO3	**2**	**3**	**2**	**-**	**2**	**2**	**3**	**-**	**-**	**1**
CO4	**3**	**3**	**2**	**1**	**2**	**3**	**3**	**1**	**1**	**3**
CO5	**2**	**3**	**2**	**1**	**2**	**2**	**2**	**2**	**-**	**2**
CO6	**2**	**3**	**2**	**1**	**-**	**2**	**2**	**1**	**-**	**1**
Average	**2.3**	**2.7**	**2.2**	**1**	**2**	**2.2**	**2.6**	**1.3**	**1**	**2**

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Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	_

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URBAN TRANSPORTATION AND NETWORKS: SPATIAL STRUCTURE OF HABITAT SYSTEM			
Course Code	MAHD106	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	2:1:1	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:

- To introduce the fundamentals of urban transport planning and its significance.
- To equip students with a comprehensive understanding of the intricate relationship between urban transportation systems and the spatial structure of urban habitats.

Module-1

TRANSPORT PLANNING- DEFINITIONS AND CONCEPTS

- Urban Transportation systems and their classification; different modes of transport and their technological characteristics; the nature of demand and supply of transport services and integrated planning.
- Scope of urban transport planning, land use-transport integration, stages involved in transport planning.

Module-2

MODES OF COMMUTE AND TRAFFIC SURVEYS

- Introduction to pedestrian, motorized, and non-motorized vehicles. Urban Transportation surveys: Definition of the study area, zoning, types of surveys- origin and destination survey, road inventory, classified traffic volume counts, pedestrian survey, parking survey and socio-economic survey.
- Forecasting traffic in relation to planned land use.

Module-3

4-STAGE MODELLING

- Trip Generation- Introduction, Definitions, Trip Purposes- Factors associated with Trip generation and Attraction, Method of analysis.
- Trip Distribution- Introduction, Methods of Trip Distribution.
- Trip Assignment –Definition, Applications, Resistance to travel, Minimum travel path tree- Assignment Techniques.
- Modal Split- Introduction, Factors Affecting, Modal Split in the Transportation Planning Process.

Module-4

TRAFFIC AND PARKING MANAGEMENT

- Introduction to traffic management and calming techniques.
- Mobility plans - introduction and process - CTTS (Comprehensive Traffic and Transportation Studies), CMP (Comprehensive Mobility Plan) and LCMP (Low Carbon Mobility Plan).
- Mobility concepts and universal accessibility.

Module-5

COMPREHENSIVE TRANSPORTATION SURVEYS AND MOBILITY PLAN

- Transportation surveys and data collection
- Use of transportation modelling
- Analysis of the findings
- Conceptual framework development
- Proposals of Mobility plan

Assessment Details: Methods of CIE need to be defined topic wise i.e.- Studio work, Seminar or micro-Project.
The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE.)
The student has to obtain a minimum of 50% in CIE to pass. Based on the CIE marks grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Submission of the studio work on regular basis in the form of drawings, models, reports of site/field trips etc.
2. The course faculty must decide the topic for the studio work and other assignments based on the design brief of Habitat Design Studio-1.
3. CIE marks to be awarded at the end of semester and to be uploaded to VTU portal.

Suggested Learning Resources:

Books

1. Khanna and Justo,"Highway Engineering", Nem Chand & Bros , 10th edition,2015.
2. Kadiyali L R., "Traffic Engineering and Transportation Planning", Khanna Publishers, 3rd Edition, 1987.
3. Dimitriou H.T, "Urban Transport Planning and Developmental Approach", Routledge, 1st Edition, 2012.

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4. Michael J Bruton, “An Introduction to Transportation Planning”, Hutchinson, 2nd Edition ,1970.
5. John Black, “Urban Transport Planning and Design”, the Johns Hopkins University Press, 1981.
6. Vukan R. Vuchic, “Urban Transit: Operations, Planning, and Economics”, Wiley, 1st Edition,2005.
7. Vukan R. Vuchic, “Urban Transit Systems and Technology”, Wiley, 1st Edition, 2007.

Web links and Video Lectures (e-Resources):

1. https://www.itdp.in/wp-content/uploads/2016/07/Urban-street-design-guidelines.pdf
2. https://islandpress.org/blog/forewordfriday-global-street-design-guide-edition
3. https://globaldesigningcities.org/publication/global-street-design-guide/defining-streets/what-is-a-street/
4. https://shaktifoundation.in/wp-content/uploads/2014/02/Universal-accessibility-guidelines.pdf
5. https://wrirosscities.org/sites/default/files/India-Integrated-Transport-Indicators-EMBARQ.pdf
6. https://www.jtlu.org/index.php/jtlu/article/view/425

Skill Development Activities Suggested

Generating formats for traffic surveys - Qualitative and Quantitative aspects.

1. Conducting field surveys and site visits to gather firsthand information and validate secondary data.
2. Analysis of urban transport projects concerning trip demands, modal split, parking management and other important components of habitat system.
3. Developing conceptual models and frameworks to understand the spatial structure and dynamics of urban transportation systems.
4. Analysis the development of an integrated land use/transport strategy for delineated area of inner city.
5. Proposing design and planning solutions to address the identified problems and improve urban transportation networks.
6. Understanding selected emerging contemporary transportation issues and their impact on the society.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Students are equipped with the fundamentals of urban transport planning, transport modelling and policies.	I, II, IV
CO2	Understanding the issues & challenges in the Transportation Sector.	II, III, IV
CO3	Students are equipped with theoretical knowledge combined with the practical applications in the field of urban transportation.	II, III, IV
CO4	Student will learn methods of designing, conducting and administering surveys to provide the required data.	II, III, IV, V
CO5	Generating strategies and proposing mobility plan for identified inner-city district.	III, IV, V, VI

Program Outcome of this course

Sl. No.	Description	POs
1	Students are equipped with the fundamentals of urban transport planning, transport modelling, policies and its implications on the spatial structure of habitats.	2, 3, 4, 7, 10
2	Analyse and interpret the evolution of Human habitat wrt transport sector.	2, 3, 5, 7, 8
3	Evaluate the contemporary dimensions of habitat design and planning.	3, 4, 5, 6, 10
4	Understanding the connection between transportation, land use, and habitat system.	1, 2, 3

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Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	-	-	-	2	2	-	3
CO2	3	1	1	-	-	1	2	2	-	2
CO3	3	3	2	2	3	2	2	2	-	2
CO4	2	2	2	2	-	2	3	3	-	2
CO5	2	3	3	2	3	2	3	3	1	2
Average	**2.3**	**2.7**	**2.2**	**1**	**2**	**2.2**	**2.6**	**1.3**	**1**	**2**

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**

Mapping Co-relation	**Low**	**Medium**	**High**	**No**
	1	**2**	**3**	**–**

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GIS - I			
Course Code	**MAHD115A**	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	1:2:0	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:

- To enable working with different data sets, data collection, mapping, analysis and creating presentation maps using Geographic Information Systems.

Module-1

Introduction to Spatial Science

- Introduction to Maps, Map scale and Spatial data, working with google earth pro software, Concepts of Point, Line and Polygon, Advantages of GIS, Components of GIS, Types of GIS software, GIS Data formats (Raster & Vector)

Module-2

Mobile GIS & Web GIS

- Introduction to Mobile GIS – Needs, Advantages, Field Data Collection Mobile App Customization, Exporting Field Data collected to Desktop GIS.
- Introduction to web GIS, Hands on Working with no-code web GIS map.

Module-3

Working with different types of Data sets

- Adding Vector, Raster, CSV data in QGIS, Working with Attribute toolbar (i-tool, attribute table tool etc.)
- Working with Attribute Table – Add, Delete, column. Changing attribute information.
- Working with the Selection toolbar (select features, deselect features etc.)
- Styling & Labelling the maps, Data Filtering / Data Querying.

Module-4

GIS Data Management

- Geo-referencing and projecting Raster Data, Creating Vector Data Model and Shapefile Creation.
- Digitization / Vectorization – Point, Line & Polygon, Creating Attributes – Text, Number, Float, Date etc.
- Advanced Digitization tool – (Snapping toolbar, advanced digitizing toolbar)
- Working with Plugins Menu – Manage and Install Plugins, Map Layout and Exporting Map in Different Format.

Module-5

Raster and DEM Data Analysis

- Raster Data Introduction, Sources of Raster Data – Bhuvan, USGS.
- Working with DEM data - contours, slope, hillshade, aspect Map, DEM Data watershed analysis, Total Station data to DEM data creation.
- Preparation of Cartographic Maps – Choropleth, Bar, Pie, and Stacked.

Assessment Details: Methods of CIE need to be defined topic wise i.e.- Studio work, Seminar or micro-Project.
The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE.)
The student has to obtain a minimum of 50% in CIE to pass. Based on the CIE marks grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Submission of the studio work on regular basis in the form of drawings, models, reports of site/field trips etc.
2. The course faculty must decide the topic for the studio work and other assignments bases on the design brief of Habitat Design Studio 1
3. CIE marks to be awarded at the end of semester and to be uploaded to VTU portal.

Suggested Learning Resources:

Books

1. George Joseph, Fundamentals of Remote Sensing, 2004, Universities Press Pvt.Ltd., Hyderabad.
2. Lilesand T.M. and Kiefer R.W., 2002, Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
3. Mohini Bherwani, (2012), Metadata in context to open source Software, Published by Dattsons.
4. "QGIS for Geographic Information System Professionals" by Kurt Menke
5. "Building Mapping Applications with QGIS" by Erik Westra.

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Web links and Video Lectures (e-Resources):

1. www.qgis.org
2. www.gisgeography.com
3. www.bhuvan.nrsc.gov.in
4. https://gistbok.ucgis.org/bok-topics/spatial-queries

Skill Development Activities Suggested

1. Composing maps for Habitat Design Studio using GIS.
2. Tracing Morphology of any chosen Habitat by digitizing old maps and datasets.
3. Understanding River Valley Systems of any chosen area.
4. Practice with open-source data sets from across the world and web mapping frameworks.
5. Learning how to use GIS Forums and Community support groups for peer-to-peer learning for technical assistance and query resolution.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Understanding basics of spatial data and mapping in GIS	I
CO2	Field mapping and collecting data using Mobile GIS	II
CO3	Compose map in QGIS	VI
CO4	Creation of Base maps for site areas	III
CO5	Visualising data and making custom maps	V

Program Outcome of this course

Sl. No.	Description	POs
1	Understand mapping as a crucial tool in Habitat data analysis.	2, 4, 10
2	Creating base maps of study areas using existing open source data sets and from field mapping, upon which further research and analysis can be carried out. BT II III	1, 2, 3, 4, 9
3	Spatial representation of various types of data related to habitats. Inferencing from datasets.	3, 5, 9, 10,7

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	**3**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**1**	**3**
CO2	**2**	**1**	**2**	**3**	**1**	**2**	**-**	**-**	**-**	
CO3	**1**	**3**	**2**	**3**	**2**	**1**	**2**	**2**	**1**	**3-**
CO4	**2**	**2**	**3**	**3**	**2**	**1**	**2**	**2**	**3**	**3**
CO5	**-**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**2**	**2**
Average	**1.6**	**2**	**2**	**3**	**1**	**1**	**0.8**	**0.8**	**1.4**	**2.2**

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	–

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REPRESENTATION TECHNIQUES			
Course Code	MAHD115B	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	1:2:0	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:

- To equip students with a comprehensive understanding of various representation techniques essential for Habitat Design Studio.

Module-1

IMPORTANCE OF REPRESENTATION IN HABITAT DESIGN

- Basic Principles and modes of Representation, Importance of communicating concepts, ideas and data effectively.
- Different types of representation techniques: Visual, digital, and mixed media.
- Traditional Representation Techniques- context of urban public spaces.

Module-2

METHODS TO DOCUMENT AND PRESENT VISUAL SURVEYS

- Observation and Interpretation of Urban Environment
- Recording, Representing, and Communicating Observations
- Graphic Language of Analysis and Design

Module-3

DIGITAL REPRESENTATION TECHNIQUES

- Data representation through various digital software.
- Digital Photography and Image Processing.
- Data Visualization and Infographics
- Rendering techniques for realistic visualizations.
- Creating thematic maps and spatial data visualization.

Module-4

MODEL MAKING – DIGITAL AND PHYSICAL MODELS

- Introduction to digital fabrication tools such as laser cutters, 3D printers.
- Using models to explore design ideas and concepts.
- Applications of digital fabrication in urban scale projects.

Module-5

IMMERSIVE TECHNOLOGIES IN URBAN DESIGN REPRESENTATION

- Basics of VR and AR in Habitat Design.
- Tools and software for creating Walk throughs, animations and simulations.

Assessment Details: Methods of CIE need to be defined topic wise i.e.- Studio work, Seminar or micro-Project.
The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE.)
The student has to obtain a minimum of 50% in CIE to pass. Based on the CIE marks grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Submission of the studio work on regular basis in the form of drawings, models, reports of site/field trips etc.
2. The course faculty must decide the topic for the studio work and other assignments bases on the design brief of Habitat Design Studio 1.
3. CIE marks to be awarded at the end of semester and to be uploaded to VTU portal.

Suggested Learning Resources:

Books

1. Urban Design Associates. (2003). The Urban Design Handbook. W. W. Norton & Company.
2. Farrelly, L. (2011). Drawing for Urban Design. Laurence King Publishing.
3. Ciriello, M. (2017). Digital Drawing for Urban Design. Routledge.

Web links and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=I_bJPNnO3HQ&ab_channel=TheSketchUpEssentials
2. https://www.youtube.com/playlist?list=PL269fVnvu-3Gen1kWJ2Udqy6pBpLKiCHe
3. https://www.youtube.com/c/ponoko/videos

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Skill Development Activities Suggested

1. Activities related to documentation of temporal changes in public spaces.
2. Massing of Urban environment using Digital representation tools.
3. Application of GIS Mapping for generating maps.
4. Exploring Model making for Habitat Design Studio Project.

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Learning of various software like SketchUp, AutoCAD, Rhino, etc	II
CO2	Analyse and interpret different maps using mapping techniques	IV
CO3	Evaluate and choose the methods to be applied for representation	V
CO4	Familiarisation of physical, digital, and mixed media	II
CO5	Application of advanced modes of presentation – AR, VR etc	V

Program Outcome of this course

Sl. No.	Description	POs
1	Identifying different modes of Presentation	1, 2
2	Understand how to interpret maps	1, 2, 3, 7, 8
3	Familiarisation with the digital mapping and model making techniques	1, 2, 7, 8
4	Advancement in technology w r to Representation of ideas and concept	2, 4, 7, 8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-
CO3	3	3	2	-	-	2	-	-	-	2
CO4	-	-	-	3	-	2	-	-	2	2
CO5	2	3	-	-	-	-	-	-	-	2
Average	1.8	2.2	1.2	0.6	0	0.8	-	-	0.4	1.2

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	–

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DATA ANALYTICS			
Course Code	MAHD115C	CIE Marks	100
Teaching Hours/Week (L:P: SDA)	1:2:0	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:

- Interpreting data to analyse cities and settlements as dynamic systems, uncovering correlations and relationships within urban environments.

Module-1

Utilizing Data for Habitat System Understanding:

- Explore the role of data in comprehending habitat systems and apply datasets to evaluate their interactions using a systems approach.
- Identify the characteristics of datasets and utilize data science libraries for analysis.

Module-2

Analysis of Consumption Patterns and Resource Management:

- Gain insights into consumption patterns, resource management, and allocation in settlements through proficient data assimilation and interpretation.

Module-3

Data's Influence on Policy Formulation and Decision Making:

- Understand how data guides policy formulation and aids in the decision-making process.

Module-4

Development Perspectives Generation:

- Generate development perspectives using modelling, simulation, and visualization techniques, effectively integrating software platforms for analysis.

Module-5

Interpretation of Habitat Context Scenarios:

- Interpret scenarios relevant to habitat contexts, addressing identified concerns and issues.
- Utilize spatial information systems, R Software, and digital applications for data interpretation.

Assessment Details: Methods of CIE need to be defined topic wise i.e.- assignments and Project work)
The weightage of Continuous Internal Evaluation (CIE) is 100% and there is no Semester End Exam (SEE.)
The student has to obtain a minimum of 50% in CIE to pass. Based on the CIE marks grading will be awarded.

Continuous Internal Evaluation:

1. Methods suggested: Submission of assignments on regular basis.
2. The course faculty has to decide the assignments and topics based on the modules.
3. CIE marks to be awarded at the end of semester and to be uploaded to VTU portal.

Suggested Learning Resources:

Books

1. Rae A & Cecilia W, Applied Data Analysis for Urban Planning and Management, SAGE Publications Ltd, October 2021.
2. Bibri S E, Big Data Science and Analytics for Smart Sustainable Urbanism, Springer Cham, 2019.
3. Yigitcanlar T & Kankanamge N, Urban Analytics with Social Media Data, Routledge, 2022.
4. Batty, M, The new Science of Cities. The MIT Press, 2013.
5. Singleton A D & Folch D, Urban Analytics, SAGE Publications, 2017

Web links and Video Lectures (e-Resources):

1. https://journals.sagepub.com/description/EPB
2. https://sukalp.crdf.org.in/thematic-area/13/urban-data-analytics#podcasts

Skill Development Activities Suggested

1. Gathering, evaluating, and managing data.
2. Creating models and simulations for data sets.
3. Developing scenarios for various habitat conditions.
4. Linking the generated outcomes to policy decisions.

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Course outcome (Course Skill Set)

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Evaluate data sets for various habitat systems.	II
CO2	Manage data sets by integrating digital platforms.	III
CO3	Interpret data to effectively communicate the analysis.	IV
CO4	Use analysed data for policy formulation and decision-making.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Facilitates understanding of the complexities of urban habitat systems.	1,2,3,7,8
2	Enables interpretation of habitat systems by integrating multiple data layers.	2,3,4,7,8,10
3	Serves as an effective tool for informed policymaking.	2, 3, 5, 6, 7, 8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	3	-	-	1	1	2	3
CO2	3	3	2	3	-	-	-	-	-	3
CO3	2	3	2	3	-	-	-	-	2	3
CO4	2	3	3	3	3	-	2	2	-	3
Average	**2.5**	**3**	**2**	**3**	**3**	**0**	**1.5**	**1.5**	**2**	**3**

Graduate Attributes

Knowledge	Analytical Skills	Application of Research	Application of latest Technology/ Tools	Generate Designs/ Solutions	Ethics	Societal Concern	Environmental Concern	Collaborative aptitude	Opportunity for Continued Learning
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10

Mapping Co-relation	Low	Medium	High	No
	1	2	3	–

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