Semester- 1

HABITAT DESIGN STUDIO-I (COMMUNITY LEVEL STUDY OF EXISTING HABITATS)			
Course Code	**22HDC11**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	2:8:0	SEE Marks	50
Total Hours of Pedagogy	10	Total Marks	100
Credits	10	Exam Hours	Viva Voce

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.
   - Land value, Tenure Pattern.
   - Institutional Framework.
2. Data Analysis and Inferences
   - The syntax of space.
   - Infrastructure service levels.
   - 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.
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.

Teaching-Learning Process	Lecture sessions, Site visits, Student presentations, Group discussions, Periodic Reviews, Workshops are part of the Teaching Learning Process

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 Internal Reviews, External Reviews and Final Portfolio Submission.

Semester End Examination:
Viva-voce: The viva voce shall be conducted for a duration of 20 minutes (per student) for the subjects listed under viva voce for all the semesters.

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.
4. Kevin Lynch, "The Image of the City", MIT Press, 1960.
5. Peter Hall, "Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century", Blackwell Publishers, 1988.

Web links and Video Lectures (e-Resources):

1. https://link.springer.com/chapter/10.1007/978-3-030-59140-3_7
2. https://discovery.ucl.ac.uk/id/eprint/1477269/1/Spatial%20Morphology,%20Urban%20History%20and%20Design.pdf
3. https://msd.unimelb.edu.au/msdx/archive/2021_s1/bachelor-of-design-studios-and-subjects/urban-design/urban-morphological-mapping
4. https://library.oapen.org/handle/20.500.12657/50404

Skill Development Activities Suggested

1. Skills to identify parameters and read 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

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

Semester- 1

HUMAN HAITAT: STUDIES AND DESIGN THOUGHT			
Course Code	**22HDC12**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	3:0:2	SEE Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	4	Exam Hours	3

Course Learning objectives:
To introduce the students to concepts and components of human habitat, its determinants, and methods of study.

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.	
Teaching-Learning Process	Introduction to the course through lectures. Discussion on studies of cities to identify the determinants of urban form and growth.
Module-2	
READING THE CITY Urban design vocabulary. Urban grid, Grain, texture, scale and socio spatial schema. Dimensions of reading the urban form. Concept of Urban space, Place and Public realm. Social Structure, Cognition, Experience and Urban form.	
Teaching-Learning Process	Introduction to the course content through lectures. Sensitising students to the aspects of urban experience and interpreting the same through cognitive maps.
Module-3	
APPROACHES TO STUDY HUMAN HABITAT Methods of Urban design surveys – Inventories and Techniques. Visual survey, site studies and other tools to understand urban environment. Qualitative and quantitative methods of analysis.	
Teaching-Learning Process	Introduction to the course content through lectures. Comparative study of survey formats used to understand qualitative and quantitative aspects of habitat.
Module-4	
CONCEPTS AND THEORIES OF URBAN FORM Imageability, Perception, townscape and elements of urban design (Gordon Cullen, Kevin Lynch). Utopian concepts. Historical examples of Urban Design Projects. Rise of Advocacy Planning, changing role of NGOs and Urban Social Movement in India.	
Teaching-Learning Process	Introduction to the course content through lectures. Presentation on reading the utopian concepts in the context of contemporary habitats through examples.
Module-5	
HABITAT DESIGN STUDIES Habitat Design, Urban Design and their relationship with planning and architecture. Role of Habitat Designer. Views of Design of Habitat as extension of architecture (mega architecture) and as architectural expression of planning. Habitat Design at micro level: City Centres, Transportation Corridors, Residential Neighbourhoods and Water Fronts.	
Teaching-Learning Process	Introduction to the course content through lectures. Discussion on role and scope of various disciplines in intervening with human habitat systems.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one 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.

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-Matthew-Carmona-and-Steven-Tiesdell.pdf

Skill Development Activities Suggested

1. Analysing cities and their components through case-studies.
2. Generating formats for urban habitat survey - Qualitative and Quantitative aspects.
3. Case studies of role played by NGOs with respect to issues concerning habitat.
4. Analysis of Urban projects concerning public spaces, transport nodes and other important components of public realm.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend the determinants which define urban form	IV
CO2	Analyse and interpret the evolution of Human habitat	V
CO3	Evaluate the contemporary dimensions of habitat design and planning	VI
CO4	Familiarisation of theoretical approaches to habitat design	II
CO5	Rationalizing the role of habitat designers	V

Program Outcome of this course

Sl. No.	Description	POs
1	Identifying components of a habitat	1, 2
2	Evaluate components of habitat systems and their complexity	1, 2, 3, 7, 8
3	Familiarisation with the existing knowledge base with respect to habitat systems	1, 2, 7, 8
4	Recognise significance of the program 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	-	-	-	-	1	1	-	-
CO2	2	3	2	-	-	-	2	2	-	2
CO3	3	3	2	2	1	2	2	2	-	2
CO4	3	2	2	-	-	-	1	1	-	2
CO5	1	3	3	-	-	1	1	1	-	-
Average	**2.4**	**2.6**	**1.8**	**0.4**	**0.2**	**0.6**	**1.4**	**1.4**	**0**	**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

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

Semester- I

PLANNING THEORY AND TECHNIQUES			
Course Code	**22HDC13**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	2:1:2	SEE Marks	50
Total Hours of Pedagogy	4	Total Marks	100
Credits	4	Exam Hours	3

Course Learning objectives:
To introduce the concepts and approaches of planning and execution
To evoke the problem-solving skills at planning level based on the different approaches and cases
To well verse the students with the organisational structure, systems, financial planning, and management

Module-1

INTRODUCTION TO PLANNING
Planning terms and definitions.
Basic principles of settlement planning and components of settlement structure.
Theories of Urban structure and Urban Sub-systems.
Planning Approaches- Regional, Metropolitan, Zonal, Local
Evolution of Planning Mechanism in India

Teaching-Learning Process	Introduction to the course content through lectures. Discussion on various Planning Approaches and Planning Mechanism in India.

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.

Teaching-Learning Process	Introduction to the course content through lectures. Literature Study of planning process across the globe. Case studies pertaining to various Urban Development Plans at different scales.

Module-3

PHYSICAL PLANNING
Aims and Objectives of Physical Planning, Levels of Planning in India, Models of Planning Process.
Concepts of Urban Land use, Systems affecting land uses and rationale for land use planning.
Urban Development Plans: Types, scope, purpose, and content.
Approaches to preparation of Interim and Comprehensive Plans: Structure Plan, Perspective Plan, Master Plan, Zonal Development Plan and Strategic Planning

Teaching-Learning Process	Introduction to the course content through lectures. Guest lecture and Group Discussion on various Town Planning Acts and its implications.

Module-4

RESOURCE MOBILISATION AND IMPLEMENTATION MECHANISM OF PHYSICAL PLANS
Modes of Implementation for various types of physical plans.
Implementation techniques – Financial planning, schemes and programs, organizational structure.
Provisions of the plan implementation through the Act- Town Planning Schemes.

Teaching-Learning Process	Introduction to the course content through lectures. Presentation on challenges faced during Implementation of Physical plans.

Module-5

TECHNIQUES FOR DATA COLLECTION AND ANALYSIS
Techniques of understanding aspects of cities and towns: spatial structure, traffic and transportation, roads and networks, demography, socio-economic, environmental, institutional and finance.
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.

Teaching-Learning Process	Introduction to the course content through lectures. Group exercise (Data collection & Analysis) to complement the studio work.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one 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, "Urban and Regional Planning", Routledge, 5th edition, 2010.
3. K.P.Yadav, "Vol 1-5- Encyclopedia of Economic Planning and Development", Ivy Publishing House.
4. 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 papers on implementation of Planning Legislations in the Country
2. Analysing impact of Planning and Regulations on the Studio Study Area through surveys and mapping.

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.	II
CO2	Understand and Analyse Planning legislations and planning process in the country	III
CO3	Comprehend the Implementation framework proposed for various plans	III
CO4	Contextualize the significance of Planning Legislation in current times.	IV
CO5	Evaluate and apply appropriate Data collection and survey Techniques for Planning	V

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	_

Semester- 1

SOCIOLOGY, CULTURE AND HUMAN HABITAT			
Course Code	**22HDS14**	CIE Marks	100
Teaching Hours/Week (L:P: SDA)	1:1:0	SEE Marks	-
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	-

Course Learning objectives:
To familiarize students with the social aspects and its implications on Human Habitat.

Module-1

INTRODUCTION
Introduction to Urban Sociology.
Theories of Urban Sociology- Emile Durkheim, Georg Simmel, Max Weber, Louis Wirth

Teaching-Learning Process	Lecture sessions and discussion on readings of theories.

Module-2

SOCIAL ELEMENTS OF A HABITAT
Society, Community, Caste, Kinship, Family, Culture, Religion.
The Urban Social Order, Social Stratification, Social Relationships and Networks.

Teaching-Learning Process	Lecture sessions and study of social elements through case studies.

Module-3

DEMOGRAPHIC CHARACTERISTICS
Demographic Transition and its influence on the physical environment.
Characteristics of communities- Homogeneity & Heterogeneity, Ethnic enclaves, social cohesion, social segregation. symbiotic relations of communities.

Teaching-Learning Process	Lecture sessions and analysing the demographic characteristics of the study area of Habitat Design Studio.

Module-4

SOCIAL INSTITUTIONS & MIGRATION
Evolution and significance of Social Institutions in contemporary urban environment. Analysis through examples.
Migration Patterns- Social Disorganization, alienation, Concerns of Privacy, and Identity.

Teaching-Learning Process	Lecture Sessions and presentations of examples of social situations defining habitats. Guest Lectures.

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.

Teaching-Learning Process	Lecture Sessions and identifying the urban processes in the study area of Habitat Design Studio.

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 Term paper submission.
Semester End Examination: Nil

Suggested Learning Resources:

Books

1. Jan and Mele, "The Urban Sociology Reader", Routledge, 2012.
2. William Flanagan, "Contemporary Urban Sociology", Cambridge University Press, 1993.
3. Henri Lefebvre, Eleonore Kofman (Editor), Elizabeth Lebas (Editor), "Writings on Cities", Wiley, 1996.
4. Mark Gottdiener, Ray Hutchison, "The New Urban Sociology", Westview Press, 2010.
5. 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://www.uc.edu/cdc/oldwebsite/fall03-readings/Urbanism_as_a_way.pdf
2. https://www.nature.com/articles/srep10265
3. https://www.jstor.org/stable/43630965
4. https://www.jstor.org/stable/23618928
5. https://www.tandfonline.com/doi/full/10.1080/07352166.2016.1255526

Skill Development Activities Suggested

1. Generate social survey formats.
2. Interpret the demographic characteristics of the identified study area.
3. Recognising 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	Understand Urban Social Theories	I
CO2	Identify the social elements organising Human Habitat	II
CO3	Comprehend the dimensions of demographic characteristics	III
CO4	Analyse spatial implications of social processes	IV
CO5	Interpreting human habitat through its social characteristics	V

Program Outcome of this course

Sl. No.	Description	POs
1	Recognise social aspects of Human Habitat	1, 2, 3, 7
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	-	-	-	-	-	-	-	-
CO2	2	3	2	-	2	-	2	-	-	1
CO3	2	3	2	1	2	-	1	-	-	-
CO4	3	3	2	1	-	1	2	1	-	1
CO5	2	3	2	1	-	2	2	1	-	1
Average	2.4	2.6	1.6	0.6	0.8	0.6	1.4	0.4	0	0.6

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	–

Semester- 1

ADVANCED THEORY OF DESIGN			
Course Code	**20HDS15**	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	2:1:0	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-

Course Learning objectives:
To gain exposure and understand the advances in Design theories and their impact on cities.

Module-1

COGNITION AND HABITAT
Environmental perception, cognition, cognitive and mental maps. Image of towns and cities.
Metaphors and iconic structures and their impacts.

Teaching-Learning Process	Introduction to the course through lectures. Book review of suggested learnings Cognitive mapping to understand surrounding habitats

Module-2

BEHAVIOURIAL ASPECTS AND URBAN FORM
Urban scale, urban spaces, urban massing. Quality of urban enclosure.
Principles of urban spatial organization. Behavioral issues in urban spaces.

Teaching-Learning Process	Introduction to the topics through lectures. National and International case studies at various scales

Module-3

DESIGN THEORIES AND URBAN MOVEMENTS
Introduction to Urban Design movements and theories: Modernism, Post Modernism, structuralism and post structuralism, ideas of self-similarity and fractals, neo classism, revivalism etc. and its impact on habitat design theory.
Theory of urban form.

Teaching-Learning Process	Introduction to the topics through lectures. Seminar /Presentations on various theories.

Module-4

THEORY OF URBANISM
Modernization & Urban Development: International Perspectives. New Urbanism – Introduction, tools and strategies.
Post-Modern Urbanism: Contextualism. Everyday Urbanism.
Post-Industrial Landscapes: Rust belts, Free Trade Zones, Sprawl.

Teaching-Learning Process	Introduction to the topics through lectures. Discussions/ Debates on relevance of current urbanist practices

Module-5

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.

Teaching-Learning Process	Lecture, Book review, Case study

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, Tests and Term Paper submission.

Semester End Examination:

Nil

Suggested Learning Resources:

Books

1. Jon Lang, "Creating Architectural Theory", John Wiley & Sons, 2nd edition, 1987.
2. Jon Lang, "Urban Design", 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.
5. Douglas Farr, "Sustainable Urbanism: Urban design with nature", John Wiley & Sons, Inc., NewJersey, 2008.
6. S. Kostoff. (1991), "The City Shaped. London", Thames and Hudson.

Web links and Video Lectures (e-Resources):

1. https://ocw.mit.edu/courses/11-328j-urban-design-skills-observing-interpreting-and-representing-the-city-fall-2004/
2. https://www.youtube.com/watch?v=waalgjQ52vM
3. https://www.youtube.com/watch?v=9oPCGKXQahk
4. https://www.academia.edu/16545395/Christopher_Alexander_A_city_is_not_a_tree

Skill Development Activities Suggested

1. Applying Cognitive Mapping as an important Tool in reconnaissance survey of site area.
2. Evaluating impact of various Urban Theories on Urban Form

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Express their habitat experience as a cognitive map	IV
CO2	Analyse the quality of urban enclosure and its impact on user behaviour	IV
CO3	Understand that cities are a result of evolution and the various ideas and theories that have shaped it.	II
CO4	Contemporary thoughts and practices in urbanism.	II
CO5	Evaluate and understand various layers that have shaped the city	V

Program Outcome of this course

Sl. No.	Description	POs
1.	Use of perception, cognition and imageability in analysing site area.	1,2,4
2.	Understand qualitative and quantitative aspects of analysing an urban environment	1,3
3.	To be more sensitive to the various layers that shape an urban environment especially while intervening in them	7,8,10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	3	1	1	-	2	2	-	1
CO2	2	2	2	-	1	2	3	3	3	3
CO3	3	3	2	-	2	1	2	1	1	1
CO4	3	1	1	1	1	1	1	3	3	3
CO5	3	3	2	1	1	1	3	1	3	1
Average	2.6	2.2	2	0.6	1.2	1	2.2	2	2	1.8

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	_

Semester- 1

RESEARCH METHODS & IPR			
Course Code	**22HDS16**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:0:2	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	3 Hours

Course Learning objectives:
The objective is to introduce the meaning, concepts, and scientific methods of Research towards a structured, systematic, and logical inquiry in projects. To introduce essential skills of writing technical research papers and fundamental aspects of Intellectual Property Rights & Research ethics.

Module-1

INTRODUCTION TO RESEARCH, RESEARCH METHODOLOGY AND RESEARCH METHODS
Objectives & Significance of Research. Scientific Research & steps involved. Classification & types of Research.
DEFINING THE RESEARCH PROBLEM
Formulation of Aims & Objectives of Research. Concepts, Constructs and Variables. Problem statement. Scope of Research. Literature review as a secondary data to enable subsequent evolution of a theoretical framework. Relevance and importance of research in Habitat design & Architecture; its role in the formulation of built environment.

Teaching-Learning Process	Lecture sessions and discussion on identified readings/ literature. Case studies pertinent to bringing out the necessity for research in Architecture & Habitat design shall be discussed.

Module-2

HYPOTHESIS
Meaning, Importance, Construction & Types of Hypotheses. Testing of hypothesis.
RESEARCH DESIGN
Meaning, Need, Importance, Principles, Characteristics of good research design, Concepts and Types of Research Designs. Cross-sectional research and Longitudinal research (Trend, Cohort, Panel studies), Ex-post factor research.

Teaching-Learning Process	Lecture notes and essay exercises shall be conducted.

Module-3

SAMPLING DESIGN
Introduction, Purpose, Applications and Advantages.
Types of Sampling Designs, Determination of sample size for estimating the population proportion.
MEASUREMENT & SCALING
Qualitative and Quantitative Data, Types of Measurement Scales, Attitude, Single item v/s Multiple Item scale, Comparative v/s non-Comparative scales, Measurement Errors, Scaling techniques, Calculation of Central Tendency.

Teaching-Learning Process	Exercises to solve problems shall be held to introduce technical aspects & problem solving related to sample design formulations.

Module-4

TECHNIQUES OF DATA COLLECTION
Secondary and Primary Data collection, Techniques relevant to Habitat design projects. Pilot Surveys.
Introduction to Meaning, Types, Advantages and Limitations of Primary data collection by Socio-economic research techniques such as:
a) Surveys
b) Questionnaires
c) Interview Schedules
d) Observations/ Experiments
e) Case Studies
f) Focused group discussions
STATISTICAL ANALYSIS OF DATA
Data processing and Analysis, Tabulation and Tools of Representations

Teaching-Learning Process	Literature readings and case studies shall be floated for techniques of data collection. Group activities in studio shall be held such as enacting interviews or formulating questionnaires.

Module-5

WRITING RESEARCH PAPER OR REPORT

Significance of Publishing, Steps in Writing, Structuring Paper/Report, Referencing, Precautions and Plagiarism norms, good publication guidelines. Impact factor.

RESEARCH ETHICS

Meaning of Ethical conduct by Researcher and implications, Ethical Codes, Responsibility of Ethics in Research & Publishing.

INTELLECTUAL PROPERTY RIGHTS

The Concept of Intellectual Property, Intellectual Property System in India. Various Acts such as Patents Act 1970, Trademark Act 1999, The Designs Act 2000, Copyright Act 1957 etc. Significance of Patenting in knowledge sharing. Leading International Instruments Concerning IPR, Enforcement of Intellectual Property Rights, UNSECO.

Teaching-Learning Process	Students shall be given a technical paper template and required to write a term paper. An expert lecture or workshop or seminar on IPR from a professional in the field shall be organized.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

Suggested Learning Resources:

1. C R Kothari & Gaurav Garg, “Research Methodology: Methods and Techniques”, New Age International Publishers, Sept 2019
2. Fred N Kerlinger, “Foundations of Behavioural Research”, Paperback. 2017
3. Ram Ahuja, “Research Methods”, Rawat Publications, 2001
4. Ranjit Kumar, “Research Methodology”, Paperback, 2014
5. Linda N. Groat& David Wang, "Architectural Research Methods", Wiley, 2013
6. Raymond Lucas, "Research Methods for Architecture", Laurence King Publishing, 2016
7. Daniel D. Watch, "Research for the Global Good: Supporting a Better World for all", Images Publishing, Austraila, 2010.
8. F. Abdul Rahim, "Thesis Writing: Manual for all Researchers", New Age International (p) Ltd., 1996
9. Biju Dharmapalan, "Scientific Research Methodology Paperback", Narosa publishing house, 2013
10. Neil Appleton (Editor), "Research Building: Planning and Design Hardcover", Design media Publishing Ltd, 2013
11. Fink A, "Conducting Research Literature Reviews: From the Internet to Paper", Sage Publications, 2009.
12. Ronald F. Czaja, Johnny Blair, "Designing Surveys: A Guide to Decisions and Procedures", SAGE Publications, Inc; Third edition, 2013.
13. Parija, Subhash Chandra, Kate, Vikram (Eds.), "Writing and Publishing a Scientific Research Paper", Springer, 2017.

Web links and Video Lectures (e-Resources):

1. http://research.vtu.ac.in/course%20materials.html
2. https://link.springer.com/
3. https://www.elsevier.com/en-in

Skill Development Activities Suggested

1. To learn or update on Statistical software
2. To publish papers based on academic works or projects undertaken
3. To attend Seminars & Conferences to present papers

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand meaning of research and formulation of research project	II
CO2	Comprehend & undertake Research design framing	III
CO3	Design Sampling framework & infer from datasets	VI
CO4	Understand data collection techniques and analysis	V
CO5	Undertake scientific writings and understand IPR frameworks & ethics	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Formulating Research projects & frameworks	1, 2, 5
2	Inducing skills to undertake data collection, analysis, and evaluation	2, 3
3	Acquainting with Research ethical conduct & IPR	1, 2, 6
4	Writing technical scientific papers	2, 3, 4, 5, 6, 7

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	1	2	-	-	-	1
CO2	2	2	3	-	1	1	-	-	-	-
CO3	1	3	2	2	1	1	1	-	-	-
CO4	2	3	3	1	-	1	-	-	1	1
CO5	3	1	3	1	1	1	-	-	2	2
Average	**2.2**	**2.2**	**2.6**	**1**	**0.8**	**1.2**	**0.2**	**0**	**0.6**	**0.8**

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**

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

Semester- 1

GIS-I			
Course Code	22HDE171	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	0:2:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:

To enable documentation, mapping, analysis and presentation using Geographic Information Systems for Habitat Design.

Course Outline:

1. Geographic Information System. Spatial Data Types and examples. Turning Geographic Information into GIS data. Geospatial data formats and suitability.
2. Creating spatial data layers. Raster – Geo-referencing scanned paper maps. Analyse elevation and produce contour lines based on Digital. Elevation Model data. Vector - Deriving geometric properties and basic statistics.
3. Create a base map by categorizing styling and labelling spatial data layers. Tracing on Satellite imagery and geo-referenced maps. Derive water streams and determine orders based on DEM data.
4. GIS data - Freely available data sources. Introduction to Open Street Maps and other relevant data sources
5. Compose and produce a printable map in GIS. Introduction to Map box tools. Create an interactive web map that is accessible for a larger audience. Practical urban design exercises.

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 Exercises, Projects, Seminars

Semester End Examination: Viva Voce

Suggested Learning Resources:

Books

1. Anupama Pai, “An Introduction to Maps”, Foundation for Ecological Research, Advocacy and Learning, 2004.
2. Peter A. Burrough, Rachael A. McDonnell, and Christopher D. Lloyd, “Principles of Geographical Information Systems”, Oxford University Press, 2015
3. Frederik Ramm, Jochen Topf, Steve Chilton, “OpenStreetMap: Using and Enhancing the Free Map of the World”, UIT Cambridge, 2010.
4. Robert Laurini, “Information Systems for Urban Planning: A Hypermedia Cooperative Approach”, Taylor & Francis Ltd, 2001.
5. Michael Zeiler, “Modeling our world: The ESRI Guide to Geodatabase Concepts”, ESRI Press, 2010.
6. C.J.Date, ” An Introduction to Data base Systems”, Addison-Wesley Publishing Company, 1995
7. Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Data base Management System”, Pearson, 2016.
8. Environmental Systems Research Institute,” Understanding GIS, The Arc Info Methods”, ESRI Press 1992

Web links and Video Lectures (e-Resources):

1. https://learnosm.org/
2. https://documentation.qgis.org/
3. https://www.qgistutorials.com/
4. https://docs.mapbox.com/help/how-mapbox-works/
5. https://wiki.openstreetmap.org/wiki/Main_Page
6. https://www.esri.com/en-us/arcgis/products/mapping/overview

Skill Development Activities Suggested

1. Composing Maps required for Habitat Design Studio using GIS.
2. Tracing Morphology of any chosen Habitat by digitising old maps and datasets.
3. Understanding River Valley systems of any chosen area.

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 mapping and GIS	I
CO2	Field mapping/collecting data using Mobile application	II
CO3	Compose map in QGIS	VI
CO4	Creation of Base maps for site areas	VI
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 upon which further research and analysis can be carried out.	1, 2, 3, 4, 8
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	-	1	-	-	-	-	1	3
CO2	2	1	3	3	1	2	-	-	-	-
CO3	1	3	3	3	2	1	2	2	1	3
CO4	2	2	3	3	2	1	2	2	3	3
CO5	-	3	3	2	-	-	-	-	2	2
Average	**1.6**	**2**	**2.4**	**2.4**	**1**	**1**	**0.8**	**0.8**	**1.4**	**2.2**

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

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

Semester- 1

REPRESENTATION TECHNIQUES			
Course Code	**22HDE172**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	(0:2:0)	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	--

Course Learning objectives:
To learn the techniques to communicate data effectively by intersecting a wide range of graphical tools.

Module-1

INTRODUCTION TO REPRESENTATION TECHNIQUES
Tools such as graphs, illustrations, diagrams, charts, flowcharts, maps, schematic drawings, images as part of expressional representations.
Case Studies-Achieving Communicative efficiency through appropriate tools. Representation modes and their capacity to alter or subvert readings.

CREATIVE TECHNIQUES FOR DESIGN AND ILLUSTRATION
Graphical Entries and Symbolism. Visual Journaling: Illustrating the talks.
Expressing ideas in editorial illustrations. Travel Maps and Cognitive mapping.

MAPPING TECHNIQUES
Digital Mapping-Different techniques and utility of tools. Participatory Mapping.
Mapping tangible and intangible components of habitats.

DATA ANALYSIS AND OPTIMISATION
Observing techniques and tools.
Speculating methods and techniques through case studies (simulating actions and changes, for presenting visions of the future and for engaging multiple actors in the process of envisioning change and guiding action).

REPRESENTATION OF OUTCOME
Design demonstration and Representation of current and future scenarios. Post design analysis.
Modelling and simulations.

Teaching-Learning Process	Introduction of various representational tools through Lectures/ examples. Guest Lecture, Group activities and case studies Observation, analysis, and Interpretation of Symbolic expressions. Applied assignments in the context of studio. Use of appropriate tool/software/actions for data analysis and optimisation

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:
Group work /Applied exercises /Individual Work & Portfolio

Semester End Examination: Viva Voce

Suggested Learning Resources:
Books

1. Tufte, Edward R, "Envisioning Information", Graphic Press, 1990.
2. Tufte, Edward R, "Visual Explanations", Graphic Press, 1997.
3. Tufte, Edward R, "The Visual Display of Quantitative Information", Graphic Press, 2001.
4. Spirn, Anne Whiston, "The Language of Landscape", Yale University Press Publishing, 1998.
5. Jacobs, Allan B, "Starting to Look" in Looking at Cities, Harvard University Press, 1985.
6. Jacobs, Allan B, "Great Streets", MIT Press, 1993.
7. Krier, Leon, "Urban Components", 1979.

8. Krier, Leon, "Drawing for Architecture", MIT Press, 2009.
9. Morris, Errol, "Believing Is Seeing: Observations on the Mysteries of Photography", Penguin Books, 2014.

Web links and Video Lectures (e-Resources):

1. https://www.gsd.harvard.edu/course/drawing-for-designers-techniques-of-expression-articulation-and-representation-fall-2021/
2. https://ocw.mit.edu/courses/11-328j-urban-design-skills-observing-interpreting-and-representing-the-city-fall-2004/
3. https://urbanfootprint.com/video/art-of-the-map-webinar/
4. https://www.mapbox.com/

Skill Development Activities Suggested

1. Mapping of various aspects/ layers related to the design studio
2. Generate Creative illustrations that make interactive presentations.
3. Techniques of data presentation

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Develop skills of careful observation, collection, assimilation and representation of data and tools for design demonstration.	IV, V
CO2	Develop Mapping tools to effectively represent human habitats	VI
CO3	Develop interactive presentation skills that integrate maps, data charts , live location data etc.	V, VI

Program Outcome of this course

Sl. No.	Description	POs
1.	Acquire techniques that help in putting across a visually convincing and evocative presentation	4,5,9,10
2.	Integration of various fields like photography, movie making, data representation etc with mapping to generate comprehensive presentations.	2,3,4,5

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	3	3	1	3	1	1	1	3	3
CO2	1	2	-	3	-	1	3	3	1	1
CO3	1	1	3	3	3	1	1	1	1	1
Average	1	2	2	2.3	2	1	1.6	1.6	1.6	1.6

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	-

Semester- 1

SUSTAINABLE URBAN PRACTICES			
Course Code	**22HDE173**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To familiarize students with sustainable design practices in habitat systems.

Course outline

1. Introduction to Sustainable Development Goals and its relevance to cities. Environmental, Economic and Social Sustainability. International policies on Sustainable Design Practices.
2. Innovative water management systems, traditional water harvesting and conservation techniques, water augmentation and sustainable storm water Management systems, Wastewater recycling.
3. Sustainable energy consumption, Optimization of energy usage, renewable energy, clean energy. Innovative usage of alternative energy. Sustainable waste management. Green Infrastructure network. Role of Urban Agriculture in sustainable city discourse.
4. City as an Ecosystem, Sustainable Land use and sustainable communities, Ecological design and ecological indices. Sustainable Transportation system.
5. Goals, objectives, process and outcome; understanding through case studies. Innovative public-private partnerships for a social innovation in the transition to low carbon-energy. Study of best practices adopted by cities across the world.

Teaching-Learning Process	Analysing sustainable practices through Discussions, presentations, and case studies. Seminar to understand the Innovative public-private partnerships for a social innovation in the transition to low carbon-energy. Presentation on Study of best practices adopted by cities across the world.

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 Exercises, Projects, Seminars
Semester End Examination: Viva Voce

Suggested Learning Resources:
Books

1. Forster O. Ndubisi, The Ecological Design and Planning Reader, Island Press, 2014
2. Joy Sen, Sustainable Urban Planning, Teri Press ; 2013
3. Ronald A Altoon and James C Auld, Urban transformation transit oriented development and the sustainable city, Image Publishing ; 2011
4. Steef Buijs, Others ed, Megacities Exploring a Sustainable Future, OlO Publishers ; 2010
5. Douglas Farr, Sustainable Urbanism: Urban Design With Nature , Marg Publication, 2007
6. Cedric Pugh, Sustainable Cities in Developing Countries, Earthscan Publications Ltd. ;2005
7. Robrt Riddell, Sustainable Urban Planning Tipping the Balance, Blackwell Publishing ; 2004
8. Dominique Gauzin-Muller, Sustainable Architecture and Urbanism, Birkhauser Publishers for Architecture ; 2002
9. John Kirkby, & Phil O'Keefe, Sustainable Development, EarthScan Publications Ltd. ; 1999
10. Martin Purvis, & Alan Grainger, Exploring Sustainable Development Geographical Perspectives, EarthScan Publications Ltd. ; 2005

Web links and Video Lectures (e-Resources):

1. https://www.edx.org/course/sustainable-cities-2
2. https://www.coursera.org/lecture/gte-sustainable-cities/sustainable-urban--hbCx5
3. https://online-learning.tudelft.nl/courses/sustainable-urban-development-discover-advanced-metropolitan-solutions/
4. https://sdgacademy.org/course/sustainable-cities/
5. https://www.asla.org/sustainableurbandevelopment.aspx

Skill Development Activities Suggested

1. Familiarisation with sustainable practices for habitat systems through seminars
2. Evaluating new sustainable practices in habitat systems

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend sustainable practices that need to be integrated in habitat systemsI	CO2
Critically evaluate best practices in sustainable strategiesV	CO3	Explore
tools, technology, and concept of sustainable development in a wide range of VI		
contexts.		

Program Outcome of this course

Sl. No.	Description	POs
1	Knowledge of sustainable practices in human habitat systems	1, 2, 7, 8 ,10
2	Holistic approach to habitat resource management	2, 3, 4 ,7, 8
3	Objective approaches to augment resources	2, 4 ,5, 7, 8 ,10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	2	3	-	2
CO2	2	3	3	2	-	1	2	3	-	2
CO3	2	2	3	3	1	1	2	3	1	2
Average	**2.3**	**2.3**	**2.6**	**2**	**0.3**	**1**	**2**	**3**	**0.3**	**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**

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

II Semester

Semester- II

HABITAT DESIGN STUDIO-II			
Course Code	**22HDC21**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	2:8:0	SEE Marks	50
Total Hours of Pedagogy	10	Total Marks	100
Credits	10	Exam Hours	Viva Voce

Course Learning objectives:
Studio aims to sensitize students to the complexities within an urban core/inner city and comprehend the nature of intervention.

Studio Outline

To examine and intervene in a delineated area of inner city.

- Documenting the existing urban fabric with emphasis on the Infrastructure provision, Environmental processes, Socio-economic aspects, political environment.
- Importance of Urban conservation with respect to historic context of site.
- Traffic management and Mobility plans.
- Significance of user group engagement and methods of stakeholder participation in program development and project formulation.
- Develop appropriate strategies to address objectives of inner-city regeneration/redevelopment.
- Implementation framework to form integral part of the project structuring.
- Diagnose implications of suggested interventions on the larger urban fabric, to re-examine values in terms of social, physical and progressive nature of change.

Documentation and Analysis may be carried out in groups and interventions to be submitted individually.

Teaching-Learning Process	Lecture sessions, Site visits, Student presentations, Group discussions, Periodic Reviews, Workshops are part of the Teaching Learning Process.

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 Internal Reviews, External Reviews and Final Portfolio Submission.

Semester End Examination:
Viva-voce: The viva voce shall be conducted for a duration of 20 minutes (per student) for the subjects listed under viva voce for all the semesters.

Suggested Learning Resources:

Books

1. Geoffrey Broadbent, “Emerging concepts in urban space design”, Taylor & Francis,1st Edition, 1995.
2. Dew, Berry and Davis, “Land Development Handbook, Planning Engineering and Surveying”, McGraw-Hill, 3rd Edition 1998.
3. Cliff Moughtin, “Urban Design – Green Dimensions”, Architectural Press, 2nd Edition 1996.
4. Robert K. Home, “Inner City Regeneration”, University Press, Cambridge, 1982.
5. David Donnison (Editor), Alan Middleton (Editor), “Regenerating the Inner City: Glasgow's Experience”, Routledge Library Editions: Urban Planning Book 10, 1987.
6. Kanad Pankaj, “Renewal for Smart Cities: A Study on Inner-City Area of Bhopal, India”, LAP LAMBERT Academic Publishing, 2018.

Web links and Video Lectures (e-Resources):

1. https://www.adb.org/sites/default/files/publication/27553/revitalization-inner-city.pdf
2. https://www.taylorfrancis.com/books/mono/10.4324/9781315889085/inner-city-regeneration-robert-home
3. https://www.researchgate.net/publication/289847994_Inner_City_Regeneration
4. https://www.worldbank.org/en/news/press-release/2016/07/13/How-eight-cities-succeeded-in-rejuvenating-their-urban-land
5. https://architexturez.net/doc/az-cf-21806
6. https://eopcw.com/find/video/855/course

Skill Development Activities Suggested

1. Reading the layers of inner-city habitat.
2. Generate framework to study the relationships between various aspects of the inner-city.
3. Comprehend stakeholder participation in inner-city interventions.
4. Generate strategies to address the complexities of inner city habitats.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Identify the components of inner-city areas	III
CO2	Analyse the infrastructure provision challenges in the inner-city	IV
CO3	Identify tools for user engagement in inner-city habitat issues	V
CO4	Generate strategies and develop design interventions for identified inner-city district	VI
CO5	Evaluate the implication of suggested strategies and design interventions	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Comprehend the complexities of inner-city areas in a city.	1, 2, 3, 4, 7, 8, 9
2	Evaluate the parameters to consider for planning/redeveloping inner-city areas.	2, 3, 4, 5, 7, 8, 9
3	Generate framework to arrive at appropriate implementation mechanism for suggested strategies.	2, 3, 4, 5, 7, 8, 9, 10

Mapping Cos and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	1	1	1	2	2	3	2
CO2	3	3	2	2	1	1	2	2	3	2
CO3	2	3	3	2	1	1	2	3	3	2
CO4	2	2	3	3	3	1	3	3	1	2
CO5	2	3	2	3	3	1	3	3	1	2
Average	**2.4**	**2.8**	**2.4**	**2.2**	**1.8**	**1**	**2.4**	**2.6**	**2.2**	**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	_

Semester- II

LAND USE STRUCTURE AND URBAN MORPHOLOGY			
Course Code	**22HDC22**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	3:0:2	SEE Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	3

Course Learning objectives:
To understand urban geography and its influencing factors like technological advancements , impact of history and culture, growth systems.

Module-1

INTERPRETING THE URBAN GEOGRAPHY
Introduction to urban geography – Triggers and Outcomes of urbanization.
Study of patterns of distribution and interaction within cities, from quantitative, qualitative, structural, and behavioural perspectives.
Understanding Urban Geography through: Cognition, perception, and spatial representation. Cognitive mapping- Contemporary and traditional methods.

Teaching-Learning Process	Introduction to the course through lectures. Book review of suggested literature.

Module-2

MORPHOLOGY OF HABITAT STRUCTURES
Renaissance and the Re-configurement of space.
Industrial revolution, Technologies and the 19th century transformation of world views. Compression of time-space and the birth of Suburbia, Idealized Space, Romanticism and the Garden City Movement.
Ideal-Space diagram and city form.

Teaching-Learning Process	Lecture and Readings are suggested. Case study/ Presentation on Morphology of selected cities and its current growth trends.

Module-3

MAPPING SACRED GEOGRAPHY
Astronomy and city structure. Vastu Shastra and the integrated world view. Sacred Geographies, Sacred Cities, Precincts and Spaces.
Sacred Rivers, Ghats, Mounds, Trees and other Totems in Urban Space. Mapping the Sacred.

Teaching-Learning Process	Lecture and Readings are suggested. Site visit / Documentation of Sacred precincts (Small/Large).

Module-4

RHYTHMS OF THE CITY
Modern work rituals and the definition of fragmented zones, time space and lives.
Nightlife and electronic definition of time.
Significance, Signs and meaning of structure.
Imagined places, collage of time space representations in Literature, Cinema and the Performing Arts.

Teaching-Learning Process	Introduction to the course through lectures. Visual learnings through movies/ documentaries/ literature sessions.

Module-5

URBAN GROWTH AND SYSTEM OF CITIES
Growth of metropolitan and mega cities: scale, complexity.
Metropolitan growth– Trends, characteristics, challenges, socio-economic and political issues in India and other Asian Geographies.

Teaching-Learning Process	Introduction to the course through lectures. Term Paper/Essays can be introduced to understand and analyse growth trends of cities across globe.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

Suggested Learning Resources:

Books

1. Spiro Kostoff, "City shaped", Bulfinch, Reprint Edition, 1993.
2. SumitaGhosh, "Introduction to settlement geography", Orient Black Swan, 1998.
3. Michael Pacione, "Urban Geography: A Global perspective", Routledge; 1st Edition, 2009.
4. Paul L Knox, "Urbanization", Pearson, 2012.
5. Diana L. Eck, "India: A Sacred Geography", Three Rivers Press, 2013
6. Barnabas Calder, "Architecture: From Prehistory to Climate Emergency" Pelican Books ,2021

Web links and Video Lectures (e-Resources):

1. https://link.springer.com/book/10.1007/978-3-319-76126-8
2. https://ocw.mit.edu/courses/4-241j-theory-of-city-form-spring-2013/
3. https://ocw.mit.edu/courses/11-949-city-visions-past-and-future-spring-2004/
4. https://www.coursera.org/lecture/asian-environmental-humanities/hindu-notions-of-matter-and-environment-b10RV
5. https://www.coursera.org/lecture/archaeology-city-levant-west/4-2-the-sacred-waters-and-the-inferior-world-To8dO
6. https://www.youtube.com/watch?v=knpSuqcH20c
7. https://www.jstor.org/stable/40343806

Skill Development Activities Suggested

1. Documentary on rhythms of the city
2. Mapping Historic cultural Landscapes.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand perceptive and cognitive elements of City Structure.	I
CO2	Analyse the factors that shape Urban Morphology	IV
CO3	Understand Urban growth and system of cities	II
CO4	Evaluate historic urban settlements and their growth factors	V
CO5	Understand growth of Indian and Asian cities and their future directions	II

Program Outcome of this course

Sl. No.	Description	POs
1	Understand cities as by-products of Historical events scientific discoveries and political decisions	1,2,7
2	Analyse rhythms of the city and their implications on site area	2,3,7,10
3	Understand Metropolitan growth challenges in developing economies and their impact on habitat design.	2,3,7,8,9

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	-	-	-	--	-	2	2
CO2	3	3	3	2	-	-	2	2	1	1
CO3	3	3	-	-	-	-	-	-	-	3
CO4	1	3	3	-	-	-	3	3	2	1
CO5	3	3	2	-	-	2	2	2	-	-
Average	2.6	2.7	1.8	0.4	-	0.4	1.6	1.4	1	1.4

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	_

Semester- II

URBAN TRANSPORTATION AND NETWORKS: SPATIAL STRUCTURE OF HABITAT SYSTEM			
Course Code	**22HDC23**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	2:1:0	SEE Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	3

Course Learning objectives:
To introduce the fundamentals of urban transport planning and its significance as an organizing factor of spatial structure of habitat systems.

Module-1

TRANSPORT PLANNING- DEFINITIONS AND CONCEPTS
Scope of urban transport planning, land use-transport integration, stages involved in transport planning.
Urban Transportation systems and its classification; different modes of transport and its technological characteristics; the nature of demand and supply of transport services and integrated planning.
Mobility concepts and accessibility.

Teaching-Learning Process	Introduction to the course content through lectures. Comparative study of land use-transport integration for different cities around the world.

Module-2

MODES OF COMMUTE AND TRAFFIC SURVEYS
Introduction to pedestrian, motorized and non-motorized vehicles.
Urban Transportation surveys: Definition of study area, zoning, types of surveys- origin and destination survey, classified traffic volume counts, pedestrian survey and parking survey.
Forecasting traffic in relation to planned land use. Social Structure, Cognition, Experience and Urban form.

Teaching-Learning Process	Introduction to the course content through lectures. Understanding different types of traffic surveys - methods of designing, conducting and administering surveys for qualitative and quantitative aspects.

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, Growth factor, Uniform growth factor, Average Growth factor, Fratar Methods and synthetic analysis, Gravity Model.
Trip Assignment –Definition, Applications, Resistance to travel, Minimum travel path tree- Assignment Techniques, All or Nothing, Multiple Route.
Modal Split: Introduction, Factors affecting, Modal Split in the Transportation Planning Process, types of modal split.

Teaching-Learning Process	Introduction to the course content through lectures. Analysing four stage modelling through relevant case studies and site visits.

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).
Parking management: norms and standards, new approaches.
Parameters of understating the design of Transport infrastructure- universal accessibility, road and intersection improvement & design.

Teaching-Learning Process	Introduction to the course content through lectures. Presentation on various traffic and parking management- norms and standards. Discussion on various mobility plans and its impact on current transportation scenario.

Module-5

INNOVATIONS IN URBAN TRANSPORTATION AND POLICIES
Concepts of TOD.
Innovations in urban transportation and its impact.
Government national transport policies and its impact and evaluation.

Policies- NUTP (*National Urban Transport Policy)*, National TOD Policy *and Metro Policy 2017.*

Teaching-Learning Process	Introduction to the course content through lectures. Presentation on comparative study of different government transport policies.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

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.
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. Urban Street Design Guidelines-Pune https://www.itdp.in/wp-content/uploads/2016/07/Urban-street-design-guidelines.pdf
2. Global Street Design Guide- 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. Universal Accessibility Guidelines- https://shaktifoundation.in/wp-content/uploads/2014/02/Universal-accessibility-guidelines.pdf
5. India Integrated Transport Indicators-EMBARQ- https://wrirosscities.org/sites/default/files/India-Integrated-Transport-Indicators-EMBARQ.pdf
6. Linking Urban Transport with Land Use (Publication)-Robert Cervero-JTLU

Skill Development Activities Suggested

1. Analysis the development of an integrated land use/transport strategy for a city through case studies.
2. Analysis of urban transport projects concerning trip demands, modal split, parking management and other important components of habitat system.
3. Understanding selected emerging contemporary transportation issues and their impact on the society.
4. Generating formats for traffic surveys - Qualitative and Quantitative aspects.

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.	IV
CO2	Understanding the issues & challenges in the Transportation Sector.	II
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.	IV, V, VI
CO5	Students will be acquainted with different norms/ standards, new challenges and approaches concerning urban transportation sector.	II

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.	3, 7, 10
2	Analyse and interpret the evolution of Human habitat wrt transport sector.	2, 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

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	3	2	3	3	3	3
CO5	3	2	2	2	2	1	2	2	2	3
Total	**2.8**	**1.8**	**1.4**	**1.2**	**1.6**	**1.2**	**2.2**	**2.2**	**1**	**2.6**

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**

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

Semester- II

URBAN DEVELOPMENT AND ENVIRONMENTAL LAWS			
Course Code	**22HDS24**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	1:1:2	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	3	Exam Hours	3

Course Learning objectives:
To familiarize the students with legal frameworks related to Urban Development and Environmental Conservation.

Module-1

INTRODUCTION TO LAWS
Concepts – Sources of law, meanings of the terms: Law, Legislations, Ordinances, Bills, Acts, Regulations, and byelaws.
Role of various Organizations in framing and implementing laws, regulations, and acts.
Evolution of Planning Legislation in India.

Teaching-Learning Process	Introduction to the course content through lectures. Case study/Discussion on Legislations and its impact on Urban Development

Module-2

LEGAL TOOLS CONNECTED WITH URBAN PLANNING AND DEVELOPMENT
Town and Country Planning, Improvement Trust and Development Authorities: Role and Objectives.
Contents and procedures for preparation and implementation of Regional plans, Development Plans, Town Planning Schemes and Area Plans.

Teaching-Learning Process	Introduction to the course content through lectures. Guest Lecture on practical challenges during implementation of Development Plans

Module-3

LEGISLATION RELATED TO USE AND CONTROL OF LAND
Land acquisition, Transfer of Development Rights.
Significance of land development control – Objectives and legal tools, critical evaluation of Zoning, Subdivision regulations, Building regulations and Byelaws, Development Code.

Teaching-Learning Process	Introduction to the course content through lectures. Application of concepts in the studio project.

Module-4

LEGISLATION RELATED TO URBAN AND ENVIRONMENTAL CONSERVATION
Legislation on Conservation of natural resources including Mining and Forestry Acts (MOEFCC)
Coastal Zone Regulations.
Conservation and Management of Ancient Monuments and Archaeological sites and ruins.
Legal Framework: Urban Heritage Conservation.
Environment v/s Development – Approaches and Analysis.

Teaching-Learning Process	Introduction to the course content through lectures. Case study/Discussion on Legislation related to Urban and Environmental Conservation.

Module-5

ENVIRONMENT MANAGEMENT SYSTEMS
Need for EMS.
ISO – 14001 and its planning implications, Need of ISO, case studies of ISO certified industries, Environmental and Financial Benefits of ISO.
Guidelines for Sustainable development by TERI, GRIHA and IGBC.

Teaching-Learning Process	Introduction to the course content through lectures. Comparative Analysis of Environment Management Systems

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 Exercises, Projects, Seminars (50%) and CIE 1&2 (50%)

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

Suggested Learning Resources:

Books

1. Herbert Girardet, (1996) "The GAIA Atlas of Cities", new edition, Gaia Books Ltd.
2. C S Yadav, "Urban planning and Policies -Volume 16-A -Part A: Reorientation of Policy Norms", Concept Publishing Company.
3. S. Kostoff. (1991), "The City Shaped. London", Thames and Hudson.
4. Kevin Lynch, (1995) "City sense and city design", The MIT Press.
5. P Leelakrishnan, (2016), Environmental Law in India, (4th Ed.).
6. Shyam Divan, (2001), "Environmental Law and Policy in India: Cases, Materials and Statutes." (2nd ed.), OUP India.

Web links and Video Lectures (e-Resources):

1. https://onlinecourses.swayam2.ac.in/cec20_ge12/preview
2. https://www.gsd.harvard.edu/course/land-use-and-environmental-law-fall-2021/
3. https://www.youtube.com/watch?v=rZnCnFdbLHg
4. https://www.youtube.com/watch?v=tsmByPHQedA
5. https://www.youtube.com/watch?v=YL_FOI2wuUs

Skill Development Activities Suggested

1. Knowledge acquired in various Acts/Laws relating to spatial planning will enable the students to apply them in professional practice as well as apply in their day to day life.
2. Orientation towards the significance of planning rules and regulations would help students to deal urban and regional planning issues within framework of human rights and environmental protection.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Familiarisation with the prevailing legal environment.	II
CO2	Orientation to evolve development strategies in the context of legal framework.	II
CO3	Comprehend intervention in the context of sensitive ecological settings and the permissible provisions.	IV
CO4	Familiarisation to interpret laws in the context of heritage conservation.	II
CO5	Identify tools for objective evaluation of planning implications	III

Program Outcome of this course

Sl. No.	Description	POs
1	Exposes the students about various planning legislation and norms.	1, 2, 3 ,7
2	Sensitize the students on various legislations that impact Urban Development	1, 2, 3, 7,10
3	Establish the corelation between Legislations, Environments and Sustainable Development	1 ,3,6,7

Mapping of COS and POs

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

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

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

Semester- II

INFRASTRUCTURE PLANNING AND MANAGEMENT			
Course Code	**22HDS25**	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	(1:1:2)	SEE Marks	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	--

Course Learning objectives:
To develop an insight on holistic infrastructure planning and management.
To introduce and well verse the concepts, process, institution and setups behind the planning, development, and management of the infrastructure at different levels.

Module-1

CONCEPTS IN URBAN INFRASTRUCTURE
Types and characteristics of infrastructure. Infrastructure provision and guiding principles.
Overview of infrastructure in India; indicators and benchmarks.
Policy Framework- National, State and Local level policies for social and physical infrastructure.

Teaching-Learning Process	Lecture sessions, Round Table Discussions Case study & presentation on specific topics in the syllabus

Module-2

PHYSICAL AND SOCIAL INFRASTRUCTURE
URBAN PHYSICAL INFRASTRUCTURE- Qualitative and Quantitative techniques of assessing requirements with emphasis on Water Supply, Sewerage, Solid Waste and Storm Water.
URBAN SOCIAL INFRASTRUCTURE- Qualitative and Quantitative techniques of assessing requirements, Planning Amenities and Institutions.

Teaching-Learning Process	Documentation & Analysis of Infrastructure in the selected study area in the studio. Application and understanding of Standards and guidelines.

Module-3

ECONOMIC INFRASTRUCTURE AND ITS ROLE IN INFRASTRUCTURE DEVELOPMENT
Economic infrastructure-Qualitative and Quantitative techniques of assessing requirements, Institutions in Economic Infrastructure.
Role of lead and corporate banks, Self Help Groups, NGOs.
Institutions and instruments of resource mobilization- Public and private sector role in resource mobilization and Urban infrastructure development related issues.
Financing systems, sources of finance, leasing and contracting methods, pricing and financing, Major National and International agencies involved.
Quality control mechanism.

Teaching-Learning Process	Introduction to the course content through lectures. Case studies on the funding models in Infrastructure Development. Group Discussion on issues related to Urban Infrastructure Development

Module-4

URBAN MANAGEMENT BODIES
Introduction to urban management.
Evolution and structure of urban management bodies. Role of Parastatals in Urban Management.
Concepts of decentralization of development and management.

Teaching-Learning Process	Introduction to the course content through lectures. Guest Lecture on grassroot level issues in Urban management Bodies.

Module-5

GOALS AND SUSTAINABLE URBAN INFRASTRUCTURE DEVELOPMENT
Managing Infrastructure development, corporatization, and related goals, decentralized and people led infrastructure provisions, social goals and equity.
Environmental and economic issues and assessments related to physical infrastructure.
Sustainable Development Goals as per United Nations- Study of Infrastructure projects in the present scenario.

Teaching-Learning Process	Introduction to the course content through lectures. Students are required to write a term paper to comprehend the learnings.

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 Studio Exercises, Projects, Seminars, Guest lectures and Term paper

Semester End Examination:

Nil

Suggested Learning Resources:

1. Green and Brown Agenda in Infrastructure provision.
2. 74th Amendment and implication on Urban Infrastructure and Management.
3. Policy Framework comparison.
4. Impact of technology in infrastructure planning and management.
5. Case studies from Asian cities of successful, innovative infrastructure provisions, equitable economic development, management and maintenance schemes.
6. Study of infrastructure in rapidly growing cities and regions: Infrastructure monitoring, infrastructure indicators development, standards, benchmarks.
7. Technological advancements: Role of spatial information technology in monitoring and planning infrastructure.
8. Policy issues in infrastructure provision: policy development and influencing factors, key issues, role of regulatory authorities.

Books

1. Herbert Girardet, (1996) "The GAIA Atlas of Cities", new edition, Gaia Books Ltd.
2. C S Yadav, "Urban planning and Policies -Volume 16-A -Part A: Reorientation of Policy Norms", Concept Publishing Company.
3. S. Kostoff. (1991), "The City Shaped. London", Thames and Hudson.
4. Kevin Lynch, (1995) "City sense and city design", The MIT Press.
5. P Leelakrishnan, (2016), Environmental Law in India, (4th Ed.).
6. Shyam Divan, (2001), "Environmental Law and Policy in India: Cases, Materials and Statutes." (2nd ed.), OUP India.

Web links and Video Lectures (e-Resources):

1. https://onlinecourses.nptel.ac.in/noc22_hs64/preview
2. https://archive.nptel.ac.in/courses/105/106/105106188/
3. https://nptel.ac.in/courses/105106115
4. https://archive.nptel.ac.in/courses/124/107/124107007/
5. https://www.youtube.com/watch?v=2F0Bdfb1GqY
6. https://www.youtube.com/watch?v=rxYJKa9Zqk4

Skill Development Activities Suggested

1. Generate Tools for infrastructure evaluation in Urban Areas
2. Audit systems for working of Urban management bodies

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand the role of physical and social infrastructure in Habitat Development.	II
CO2	Understand roles, functions and relationships between various parastatal and civic bodies in urban management.	IV
CO3	Understanding the institution, policy, finance systems and management of infrastructure	II

Program Outcome of this course

Sl. No.	Description	POs
1	Analyse and understand the role of infrastructure in Sustainable Habitat Design	1,2,7,8
2	Understand working of urban management bodies with respect to the site area.	1,3,9,10
3	Qualitative and quantitative Analysis of existing Urban Infrastructure and their shortcomings.	2,3,6,7,8,10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	**3**	**1**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**-**
CO2	**1**	**3**	**3**	**-**	**-**	**-**	**3**	**-**	**-**	**3**
CO3				**3**	**3**	**2**	**1**	**1**	**2**	**2**
Average	**1.3**	**1.3**	**1**	**1**	**1**	**1.6**	**2.3**	**1.3**	**.6**	**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

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

Semester- II

URBAN ECONOMICS			
Course Code	**22HDS26**	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	1:1:0	SEE Marks	-
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	-

Course Learning objectives:
To familiarize students with the fundamentals of Urban Economics and economic forces defining urban habitat.

Module-1

INTRODUCTION TO THEORIES OF URBAN ECONOMICS
Basics of demand and supply, Theory of Agglomerations, Bid Rent Theory.
Economic principles of Urban Land uses, Urban location theory, Location Models.

Teaching-Learning Process	Introduction through lecture sessions. Mapping activity to understand distance from the city cores and associated land values in cities.

Module-2

INDIAN ECONOMIC REFORMS
Effect of Liberalization, Privatization, Globalization of Indian economy on Urban habitat.
Global economy and its relation to Indian urban economy.

Teaching-Learning Process	Introduction through lecture sessions. Discussion on the readings related to Globalisation and the impact on Indian economy.

Module-3

LAND ECONOMICS
Urban land as an economic resource.
Land Economics and Spatial Planning mechanisms.
Urban Land policy and its implications at various levels of decision making.
Land taxation, Land bank and Planning Regulations.

Teaching-Learning Process	Introduction through lecture sessions. Student presentation on Land policy and the associated implication for the Habitat Design Studio study area.

Module-4

ECONOMICS OF HOUSING MARKETS
Urban Housing and Real Estate- Dynamics of Housing Stock, Housing Prices and Consumption patterns.
Land utilization costs, Capital cost, Building costs, Replicability and Feasibility.

Teaching-Learning Process	Introduction through lecture sessions. Guest Lecture on Housing consumption patterns and its implications. Discussion on relevant readings shared. Term paper discussion.

Module-5

FINANCE SYSTEMS
Sources of Finance, Role of Public and Private sector in financing habitat interventions.
Mortgages, Securitization in the real estate sector.
FDI in Indian real estate and other global finance mechanisms. Habitat Design at micro level: City Centres, Transportation Corridors, Residential Neighbourhoods and Water Fronts.

Teaching-Learning Process	Introduction through lecture sessions. Seminar by students on the collaborative role of public private engagement through finance mechanisms for habitat interventions.

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 Term paper submission.

Semester End Examination: Nil

Suggested Learning Resources:

Books

1. Jack Harvey, "Urban Land Economics", Palgrave Macmillan, 6th Edition, 2003.
2. Amitabh Kundu, "Urban land markets land price changes", Ashgate,1997.
3. Evans, A, "Economics and land use planning", Blackwell, 2004.
4. Alain Bertaud, "Order without Design: How Markets Shape Cities", The MIT Press, 2018.
5. John F. McDonald, Daniel P. McMillen, "Urban Economics and Real Estate: Theory and Policy", John Wiley & Sons, 2010.
6. Prasanna K. Mohanty, "Planning and Economics of Cities: Shaping India's Form and Future", SAGE Publications India Pvt Ltd, 2018.

Web links and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=kV6XE1j30sk
2. https://link.springer.com/chapter/10.1007/978-3-319-39812-9_2
3. https://www.jstor.org/stable/2097629
4. https://www.jstor.org/stable/41107365
5. https://www.nber.org/programs-projects/programs-working-groups%23Groups/urban-economics?page=1&perPage=50
6. https://www.frontiersin.org/journals/sustainable-cities/sections/urban-economics

Skill Development Activities Suggested

1. Read the habitat through its economic aspects
2. Spatial representation of implication of economic factors on human habitat.
3. Generate tools/frameworks to identify the relationship of economic factors with the other aspects of the habitat.
4. Comprehend the economics of housing markets and its implications.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend the implication of economics on human habitat	II
CO2	Familiarise with the knowledge base in the discipline	I
CO3	Evaluate the economic value of land and its implication on the habitat form and structure	VI
CO4	Asses local and global economic impacts on the evolution of habitats	V
CO5	Integrate the layer of economics while addressing habitat issues	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Comprehending habitats in holistic perspective through its economic aspects	1, 2, 3, 6, 7, 8, 10
2	Generate an inter-relationship framework of economic aspects and other aspects in a habitat	1, 2, 3, 5, 6, 7, 8
3	Generate a responsive approach to habitat design in the context of economics of the habitat	2, 3, 4, 5, 6, 7, 8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	1	-	2	2	2	1	2
CO2	3	2	1	-	-	-	1	1	-	1
CO3	2	3	3	3	1	-	1	1	2	1
CO4	3	3	2	1	-	1	1	1	-	2
CO5	2	2	3	2	2	1	1	1	1	2
Average	**2.6**	**2.6**	**2.2**	**1.4**	**0.6**	**0.8**	**1.2**	**1.2**	**0.8**	**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

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

Semester- II

HERITAGE HABITAT: CONSERVATION AND RENEWAL			
Course Code	**22HDE271**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	(1:1:0)	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	--

Course Learning objectives:
To equip students to deal with conservation and recycling along with related design issues of existingurban environment, old cities, natural and urban heritage areas.

Module-1

INTRODUCTION - HISTORY AND HERITAGE
Concepts of History, Heritage and means of recording them. Heritage and Identity, Need for preserving Heritage. Threats to Heritage. Heritage and cities, Historic and Inner City Areas and other Natural elements.

Teaching-Learning Process	Lecture sessions to introduce concepts. Group Discussion/ Site visit

Module-2

THE PRINCIPLES AND PHILOSOPHY OF CONSERVATION -DIFFERENT PERSPECTIVES
Introduction to conservation. Technical Process of Conservation. Concepts and approaches to conservation in India and other countries. Process of Conservation at Building and Urban level. (Listing, Survey and mapping, Inventory, Measured Drawing and Condition Assessment)
Socio-economic development, tourism infrastructure development and role of urban conservation. Historic overview of recycling cities.
Conservation Area practice, adaptive reuse, upgradation programs in old areas, infill design. Concept of world Heritage, World heritage cities, Cultural Landscapes, Historic urban Landscapes, Conservation at City level.

Teaching-Learning Process	Lecture sessions to introduce concepts. Case studies and comparative analysis of Conservation.

Module-3

POLICIES, LAWS AND CHARTERS
Institutional Aspects of Conservation - Charters - World Heritage legislation and Sites Conservation Acts.
Legislation Archaeological Acts Institutional framework for conservation in India and other countries. Legislation frameworks and institutional frameworks for special areas, urban conservation, and urban recycling.

Teaching-Learning Process	Lecture sessions fundamental readings/ literature shall be floated. Case study of International Conservation Charters, International heritage conservation examples

Module-4

HERITAGE ECONOMICS/ IMPLEMENTATION FRAMEWORK
Financial and Implementation framework for urban conservation and Adaptive Reuse Projects. Conservation management, community participation, economic regeneration, upgrading infrastructure, financing and implementation framework for redevelopment and revitalization projects.

Teaching-Learning Process	Lecture sessions fundamental readings/ literature shall be floated Case study and site study of relevant examples.

Module-5

CURRENT CONSERVATION PRACTICES
Risk & Threat Preparedness-Heritage in the times of Conflicts and disasters.
Urban recycling and brown field projects, urban renewal and development strategies for regeneration of inner-city areas.
Best practices in Urban Conservation and Regeneration in India and other countries through case studies.

Teaching -Learning Process	Lecture sessions fundamental readings/ literature shall be floated Case study and site study of relevant examples.

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 Term paper submission.

Semester End Examination:

Viva Voce

Suggested Learning Resources:

Books

1. Alan Dobby, "Conservation and Planning", Hutchinson, 1978.
2. Abdul Wasay Najimi, "Herat – The Islamic City (A study in Urban Conservation)", Sanctum Books, 1987.
3. Bernard Feildan, "Conservation of Historic Buildings", Architectural Press, 3rd edition, 1982.
4. Erica Av rami, Randall Mason, Marta de la Torre, "Values and Heritage Conservation", The Paul Getty Trusts, 2000.
5. Jeff Cody, Francesco Siravo, "Historic Cities: Issues in Urban Conservation. Volume 8 of Readings in conservation", Getty Publications, 2019.
6. Francesco Bandarin, Ron van Oers, "The Historic Urban Landscape: Managing Heritage in an Urban Century", John Wiley & Sons,2012.
7. Nathaniel Lichfield, "Economics in Urban Conservation", Cambridge University Press, 1988
8. Alexander Stille, "The Future of the Past", Picador, 2003.

Web links and Video Lectures (e-Resources):

1. https://www.digimat.in/nptel/courses/video/124105003/L15.html
2. https://www.youtube.com/watch?v=Zo5I99wzLF0
3. https://www.youtube.com/watch?v=ZXPiMZOl-aw
4. https://riba-prd-assets.azureedge.net/-/media/Files/Conservation/12601-International-Case-Studies-v8-(1).pdf?rev=5e942c1c1bdf4137aafbdff1cf8ff2da

Skill Development Activities Suggested

1. Detailed Documentation of Urban Heritage Precincts.
2. Research Paper on relevant topics.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand various concepts of History, Heritage and Habitats	I
CO2	Comprehend various methods of conservation and their application.	III, IV
CO3	Understand role of Conservation in Urban renewal and Economy generation.	V, IV

Program Outcome of this course

Sl. No.	Description	POs
1.	Capacity to analyse and understand complex urban environments in historic setting	1,2,6,7
2.	Familiarise with Legal, Financial and Implementation framework for Urban conservation	2,3,4,7.9.10
3.	Application of current conservation practices as part of Habitat Design studio	3,4,5,6,7

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	-	3	3	-	3
CO2	-	3	3	2	-	2	2	-	-	-
CO3	-	-	3	3	2	-	-	-	2	2
AVERAGE	1	1	2	2	0.6	0.6	1.6	1	0.6	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	_

Semester- II

GIS-II			
Course Code	22HDE272	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To optimise the use of GIS as a tool in enabling spatial data analysis and research and in effective data representation.

Course Outline:

Advanced Data Models:
Surface representation, Grid model Three–dimensional objects,
Representation of time. Network model, Model for movement over surfaces
Combination of models, The representation of networks, Node-node adjacency matrix,
Computation of shortest paths on a network, Terrain Analysis

Geographic Query and Analysis
Types of spatial analysis - Queries and reasoning, Measurements, Transformations.
Optimisation techniques, Hypothesis testing, Spatial interpolation Inverse distance weighting, Density estimation and potential, Advanced spatial analysis,
Descriptive summaries–Centers, Dispersion, Histograms and pie charts, Scatter plots, Spatial dependence, Fragmentation and Fractional dimension.

The Future of GIS:
Future data, Location - based services and GIS, Future hardware, Future prospects of hardware, Future software trends, interface and WIMPs,
Distributed databases, GIS user needs, GIS software research.
GIS interoperability, Future issues and problems – Privacy, Data ownership,
Scientific visualization, new focus.

Creating Reports:
Definition, concept of Web GIS, History of web GIS, components of web GIS, internet, web GIS v/s Internet GIS, Sharing Work, and Publishing Maps over intranet/Internet, collaborative web mapping, Web Mapping Services, Open Layers, Goggle maps

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 Lab Exercises, Projects, Reviews

Semester End Examination: Viva Voce

Suggested Learning Resources:

Books

1. Price, Maribeth Hughett. Mastering ArcGIS. United States, McGraw-Hill, 2014.
2. Chang, Kang-Tsung. Introduction to Geographic Information Systems. United Kingdom, McGraw-Hill, 2002.
3. The SAGE Handbook of GIS and Society. United Kingdom, SAGE Publications, 2011.

Web links and Video Lectures (e-Resources):

1. https://www.esri.com/en-us/arcgis/products/mapping/overview
2. https://gistbok.ucgis.org/bok-topics/spatial-queries
3. https://www.youtube.com/watch?v=53FrWe0vjJ0
4. https://www.youtube.com/watch?v=gdBZERqFrro

Skill Development Activities Suggested

1. Formulating Research Questions in Geo Spatial Analysis – Creating and Running models based on the research question.
2. Application of GIS in understanding Geo Morphology of chosen Habitat.
3. Application of GIS to understand Real Estate/ Traffic Systems/ Green Network systems of an urban area.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Representation of Topographic and other geographic features on maps.	III
CO2	Describe and differentiate between the components of a spatial query.	IV
CO3	Arrive at general types of spatial relations.	IV
CO4	Translate spatial problems into spatial queries when appropriate.	V
CO5	Differentiate between the general approaches to carrying out spatial queries and identify the most suitable approach(es) in a specific situation	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Understand processes that manipulates or synthesize spatial data to explore spatial patterns and to examine spatial relationships among geographical features.	2, 3, 4
2	Understand use of GIS as a tool to record patterns seen in human habitats and provide solutions based on the same.	3, 4, 7, 9, 10
3	Understand use of GIS in improving quality and efficiency of public data access and as a major communication tool with end users	3, 4, 7, 8, 10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	2	2	3	-	-	-	-	2	2
CO2	1	3	2	2	2	-	-	-	-	1
CO3	2	3	3	3	2	-	-	1	1	1
CO4	1	2	3	3	-	-	-	2	-	2
CO5	2	3	3	3	2	-	2	3	2	2
Average	**1.4**	**2.6**	**2.6**	**2.8**	**1.2**	**0**	**0.4**	**1.2**	**1**	**1.6**

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

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

Semester- II

DATA ANALYTICS			
Course Code	**22HDE273**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To read cities/settlements as dynamic systems through data interpretation and their co-relation.

1. Role of Data in understanding and interpreting Habitat Systems. Application of data sets and assess their interactions by formulating Systems approach. Identifying the nature of data sets and use of data science libraries.
2. Acquire insights in Consumption patterns, Management and Allocation of resources in settlements through effective data assimilation and interpretation.
3. Understanding the role of Data in guiding policies and assisting in decision making process.
4. To generate development perspectives through modelling, simulation and other visualisation techniques through effective use and integration of software platforms.
5. To interpret scenarios for habitat contexts for concerns/issues identified.

Use of spatial information system, R Software and applied digital applications for data interpretation.

Teaching-Learning Process	Topics are introduced through lecture sessions. Lab exercises assist in hands-on learning to integrate relevant platforms for data interpretation.

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 Lab Exercises, Projects, Reviews
Semester End Examination: Viva Voce

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://www.theatlantic.com/technology/archive/2018/11/city-apps-help-and-hinderdisability/574963/.
2. https://www.theatlantic.com/technology/archive/2018/06/satellite-images-can-harm-the-poorest-citizens/561920/
3. https://journals.sagepub.com/home/epb
4. https://www.theatlantic.com/technology/archive/2018/11/city-apps-help-and-hinderdisability/574963/.

Skill Development Activities Suggested

1. Sourcing data, data assessment and management.
2. Developing models and simulations for data sets.
3. Generating scenarios for different habitat situations.
4. Establish connections between generated outcome and policy decisions.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Assess Data sets of habitat systems	III
CO2	Manage data sets through integration of digital platforms	V
CO3	Interpret data to effectively communicate data analysed	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Assists in understanding the complexities of habitat systems	1, 2, 3, 7, 8
2	Provides for interpretation of habitat systems through integration of various layers	2, 3, 4 ,7, 10
3	Effective tool for arriving at relevant policy making.	2, 3, 5, 6, 7, 8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	1	2	2	2	1	2
CO2	1	2	2	3	2	2	2	2	1	2
CO3	2	3	3	3	2	1	2	2	1	2
Average	**1.7**	**2.7**	**2.3**	**3**	**1.7**	**1.7**	**2**	**2**	**1**	**2**

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**

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

Semester- II

URBAN GOVERNANCE			
Course Code	**22HDE274**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	2

Course Learning objectives:
To familiarize students with the fundamentals of Urban Economics and economic forces defining urban habitat.

Course outline

1. Basic concepts of urban governance and definitions. Principles of governance of urban areas. Local administration, Structure of local bodies and their role in urban governance, plan making and implementation. Recent amendments to the Constitution and their implications on governance. Concepts of capacity building and related issues of development of manpower. Central and State systems of local administration
2. People's participation- theories, concepts and methods. Participatory governance definition, processes and methods. Role of people's participation in plan making. People, NGOs and civil society and urban development.
3. The economics of geographical concentration -urbanization, history of urbanization, agglomeration economics, and simple theory of interurban location, location decisions of households
4. Finance mechanisms of local administration. Various forms of revenue generation and budgeting. Innovations in methods of revenue generation.
5. Types of urban development projects, project cycle, Project identification, selection, preparation, appraisal, monitoring and evaluation. Outcome: Students should be able to proficient in • Concepts of urban governance, overlapping of territory, various stakeholder and their role in the city • Infrastructure and finance aspects of local administration.

Teaching-Learning Process	Students are provided with readings conforming to the syllabus outline. Discussions in class take place in the context of readings shared

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, Term Paper, External Review
Semester End Examination: Viva Voce

Suggested Learning Resources:

Books

1. K.C. Sivaramakrishnan, Governing Megacities: Fractured Thinking, Fragmented Setup, Introduction (Oxford University Press: 2014)
2. Anuj Bhuwania, Courting the People: Public Interest Litigation in Post-Emergency India (Cambridge University Press: 2017)
3. Praveen Donthi, The Road to Gurgaon, Caravan Magazine (January 2014)
4. Reserve Bank of India, Municipal Finance in India: An Assessment, Chapter 3 (December 2007)
5. Partha Mukhopadhyay, Unsmart Cities, Livemint (June 2016)

Web links and Video Lectures (e-Resources):

1. https://www.youtube.com/watch?v=rxYJKa9Zqk4
2. http://www.nitttrc.edu.in/nptel/courses/video/124107007/L43.html
3. https://onlinecourses.nptel.ac.in/noc20_ar12/preview
4. https://www.jstor.org/stable/41856351

Skill Development Activities Suggested

1. Evaluating the influence of economic factors in habitat transformation.
2. Representation of economic aspects of the habitat through thematic diagrams.
3. Evaluating resource mobilisation mechanism in development projects.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understand the fundamentals of Urban Governance System and Administrative structure.	II
CO2	Know the Importance of Public Participation, Process involved, Role of NGOs and other stakeholders in Urban Development.	V
CO3	Understand various aspects of Urban Economics	III
CO4	Understand Financial management in Urban Governance, Local Governance system, Methods of Revenue Generation	IV
CO5	Comprehend determinants and Methods for Project Development, Other Financial aspects involved in the development of Infrastructure.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Recognise the Role and Significance of Urban Governance in habitat Management.	1,3
2	Incorporate Public Participation in holistic Urban Governance.	1,6,7
3	Influence of Economic factors and development of Infrastructure in habitat transformation	1,3,5,7,8

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	2	1	1	2	2	1	-	2
CO2	3	2	3	3	3	3	3	2	2	2
CO3	3	3	2	1	1	1	1	1	-	-
CO4	3	2	3	3	3	2	2	1	1	-
CO5	3	2	2	2	2	2	2	2	-	2
Average	**3**	**2**	**2.4**	**2**	**2**	**2**	**2**	**1.4**	**0.6**	**1.2**

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	_

III Semester

HABITAT DESIGN STUDIO-III (NEW EXTENSIONS TO EXISTING CITY)			
Course Code	**22HDC31**	CIE Marks	50
Teaching Hours/Week (L:P: SDA)	2:8:0	SEE Marks	50
Total Hours of Pedagogy	10	Total Marks	100
Credits	10	Exam Hours	Viva Voce

Course Learning objectives:
Studio intent is to sensitize students to dynamics of conceiving and implementing new urban development.

Studio Outline

The project involves a new development/extension to an existing city.

- A realistic project to be identified with specific client (Real or Imaginary) requirement.
- The project should involve large site area, population, and complexity of functions.
- Geographical settings and siting, Assessment of site resources- Analysis through Ecological theories and processes. Study of Geomorphology, Physiography, Geology, Hydrology, Vegetation and Wildlife.
- Study of existing settlements in the influence area, importance of Social Impact Assessment.
- Documenting Cultural resources, Heritage Districts and Monuments.
- Urban open space systems, Green networks.
- Infrastructure Assessment and planning- Road Networks, Site Grading and Drainage, Sewerage, Water Supply and Electricity.
- Legal aspects of land ownership, Planning and Development tools.
- Stakeholder engagement.
- Development Strategy- Funding, Cost Recovery Systems, Project formulation, Phasing and Infrastructure Development.

Project should conclude in a three-dimensional design demonstration.
Site Study may be carried out in groups and interventions to be submitted individually.

Teaching-Learning Process	Lecture sessions, Site visits, Student presentations, Group discussions, Periodic Reviews (Internal & External), Workshops are part of the Teaching Learning Process

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 Internal Reviews, External Reviews and Final Portfolio Submission.

Semester End Examination:
Viva-voce - The viva voce shall be conducted for a duration of 20 minutes (per student).

Suggested Learning Resources:
Books

1. C.A. Doxiadis, “Ekistics”, Oxford University Press, 1st edition, 1968.
2. Le Corbusier, “Towards a new Architecture”, Martino Fine Books, 2014.
3. David Bell & Mark Jayne, “Small Cities - Urban Experience beyond the Metropolis”, Routledge, 1st Edition, 2006.
4. Peter Bosselmann, “Representation of Places - Reality and Realism in City Design”, University of California Press, 1998.
5. Cecilia Tacoli-, “Rural Urban Linkages”, Routledge; 1st Edition, 1996.
6. Christa van Santen, “Light Zone City - Light Planning in the Urban Context”, Birkhauser, 1st Edition, 2006.
7. Givoni B, “Climate and Urban Design”, New Age International Private Limited; 2nd Edition, 2012.
8. Ian McHarg, “Design with Nature”, John Wiley & Sons, 1995.
9. Geoffrey Broadbent, “Emerging concepts in Urban Space Design”, Taylor & Francis, 1st Edition, 1995.

Web links and Video Lectures (e-Resources):

1. https://unhabitat.org/sites/default/files/download-manager-files/Analysis%20of%20city%20extensions%20FINAL-LowRes.pdf
2. https://www.worldbank.org/en/topic/urbandevelopment/overview
3. https://transportgeography.org/contents/chapter8/urban-land-use-transportation/urban-expansion/
4. https://doi.org/10.1016/j.apm.2016.08.002
5. https://www.wri.org/research/towards-more-equal-city-framing-challenges-and-opportunities

Skill Development Activities Suggested

1. Mapping and evaluation techniques for extension of settlements/ new settlements.
2. Method/ Technique of Social Impact Assessment.
3. Formulating Development Guidelines.
4. Development Impact assessment.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	To assess conditions to site new habitats & augment infrastructure	V
CO2	Generate Masterplan and Development guidelines for the new habitat	V
CO3	Develop humane habitats through sensitive design approaches	VI
CO4	Devise implementation mechanism for proposed new development	VI
CO5	Evaluate the impact of development	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Ability to assess and augment extension of settlement fabric	2, 3, 4, 6, 7, 8
2	Evolve new habitat systems	2, 3, 4, 5 6, 7, 8
3	Generate project implementation mechanism	3, 5, 9, 10
4	Ability to assess implication of new settlements	2, 3, 6, 7, 8

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	3	2	-	-	2	2	3	2
CO2	2	2	2	2	3	1	1	1	1	1
CO3	2	3	2	3	3	2	2	2	1	1
CO4	2	2	2	2	3	2	2	2	2	2
CO5	1	3	1	2	3	2	3	3	2	2
Average	**1.8**	**2.6**	**2.4**	**2.2**	**2.4**	**1.4**	**2**	**2.4**	**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**

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

HOUSING AND COMMUNITY: POLICY, FINANCE AND PUBLIC PRIVATE PARTICIPATION			
Course Code	**22HDC32**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	3:0:2	SEE Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	4	Exam Hours	3

Course Learning objectives:
To understand the dynamics of housing and the associated processes in defining the habitat.

Module-1

INTRODUCTION TO HOUSING
Definitions and components of housing.
Housing in relation to non-residential components of settlement.
Housing concepts & characteristics. Housing as a process.
Importance of Housing Need Assessment: Housing demand, supply and gap.
Role of housing in socio-economic development of the nation.

Teaching-Learning Process	Introduction to the course through lectures. Discussion on types of housing, role of housing/construction industry

Module-2

HOUSING PROVISION AND STRESSED COMMUNITIES
Housing tenure types- its impact (Social and Economic) on the households. Home ownership, Rental Housing (Public and Private)
Housing Affordability. Housing Stress.
Housing Challenges- Slums and Squatter settlements.
Methods of enabling housing - Public Housing, Sites and Services, Self Help Groups, NGO engagement.

Teaching-Learning Process	Introduction to the course content through lectures. Discussion sessions/ Site visit on Housing challenges and emerging solutions

Module-3

HOUSING-INDIA
The role of government in Indian housing sector - as a developer, financier and policy maker. Critical assessment in the era of privatization.
National Housing Policy.
Housing schemes in India.
Role of HUDCO, State Housing Boards in provision of housing.

Teaching-Learning Process	Introduction to the course content through lectures. Seminar on Housing Schemes and Role of government

Module-4

HOUSING FINANCE
Finance mechanisms for Housing provision- Role of public and private agencies.
Role of NHB, Housing finance companies (HFC's), Co-operatives.
Mechanism for housing loans for various income groups and industry.
Role of Microfinance.

Teaching-Learning Process	Introduction to the course content through lectures. Discussion sessions on implication of various finance mechanisms

Module-5

ROLE OF PRIVATE SECTOR
Privatization in housing provision and Role of private sector in housing infrastructure development.
Globalization and effect of global capital participation in housing and urban infrastructure sector.
FDI in housing and SEBI's regulations on REIT.
Legislations related to provision of housing- RERA.

Teaching-Learning Process	Introduction to the course content through lectures. Case studies of private sector involvement in housing projects

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

Suggested Learning Resources:

Books

1. P K Sarkar, "Housing laws in India – Problems and Remedies", Eastern Law House; 2000.
2. Kavita Datta and Gareth Jones, "Housing Finance In Developing Countries", Routledge, 1st Edition, 2012.
3. Cedric Pugh, "Housing and Urbanization", SAGE Publications Pvt. Ltd; 1st Edition, 1990.
4. P K Guha, "Housing- An Indian Perspective", New Central Book Agency, 1999.
5. K Ranga Rao & M S A Rao, "Cities and Slums - A study of squatters' settlement in the city of Vijayawada", Concept Publishing Company.
6. Geoffrey Kayne, "Urban Housing in the 3rd world", New Central Book Agency,1999
7. N V Modak, "Town and Country Planning and Housing", Sangam Books Ltd, 1979.

Web links and Video Lectures (e-Resources):

1. https://www.wricitiesindia.org/content/sustainable-housing
2. https://mohua.gov.in/cms/schemes-or-programmes.php
3. https://www.wri.org/insights/confronting-urban-housing-gap
4. https://www.worldbank.org/en/news/infographic/2016/05/13/housing-for-all-by-2030
5. https://unhabitat.org/topic/housing

Skill Development Activities Suggested

1. Analysis of Housing Policies of various countries.
2. Case studies of public housing projects.
3. Studies of affordable housing projects in Bangalore.
4. Study of NGO engagement in enabling housing.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend the importance of Housing	I
CO2	Identify the significance of Housing Policy	IV
CO3	Assess engagement of public and private sector in Housing provision	V
CO4	Identify the complexities of Housing finance	IV
CO5	Evaluate the impact of globalisation on Housing provision	V

Program Outcome of this course

Sl. No.	Description	POs
1	Ability to understand Housing as a significant component of habitat	1, 2, 10
2	Comprehend the role of various stakeholders in defining the nature of Housing and hence the habitat	2, 6, 7, 8, 10
3	Understand the various dimensions of housing provision and the impact on habitat	1, 2, 3, 6, 7, 8
4	Assess the impact of globalisation on housing and infrastructure provision	1, 2, 3, 10

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	1	-	-	-	-	1	-
CO2	2	3	3	-	-	1	1	1	-	-
CO3	2	3	3	-	-	1	2	1	-	2
CO4	2	3	3	1	-	1	2	-	1	2
CO5	2	2	3	1	-	1	2	1	1	2
Average	**2.2**	**2.8**	**2.8**	**0.6**	**-**	**0.8**	**1.4**	**0.6**	**0.6**	**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**

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

ECOLOGY AND SUSTAINABLE HABITAT SYSTEMS			
Course Code	**22HDC33**	CIE Marks	50
Teaching Hours/Week (L : P : SDA)	2:0:2	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	3	Exam Hours	3

Course Learning objectives:
Comprehend approaches to evolve sustainable habitats and realise impact of development on environment.

Module-1

CONCEPTS AND PRICIPLES OF ECOLOGY
Concepts of settlement ecology- Nature as the primary layer, urban development as the secondary layer.
Introduction to Sustainability- Definition, principles, and Evolution.
Sustainability concepts w.r.t Nature, built heritage and community networks.

Teaching-Learning Process	Introduction to various topics through lecture sessions Exercises of understanding various ecological layers by examining cases.

Module-2

HUMAN HABITAT AND THE ENVIRONMENT
Cities as centers of Consumption of land, water, energy resources and forest cover.
Ecological Footprint: Causes and impact of development on ecosystem related to energy and resource depletion.
Urban Metabolism- From Linear to Circular.

Teaching-Learning Process	Course content delivery through lectures. Understanding the impacts of developmental decisions on local ecosystems through cases. Cases may be presented as seminar by students. Comparative analysis between linear and circular eco-systems.

Module-3

PRACTICES IN ENVIRONMENT MANAGEMENT
Mitigation and adaptation to Climate Crisis in cities.
Integrating Disaster Management and building resilience.
Planning and management through participatory and inclusive methods.
Understanding Green Infrastructure network and its implications through case studies.

Teaching-Learning Process	Introduction to the course content through lectures. Comparative studies on impacts of participatory & inclusive approaches v/s exclusive approaches by taking up case studies (bottom-up v/s top-down approaches)

Module-4

PUBLIC HEALTH AND ENVIRONMENT
Environment and Informal Settlements; Characteristics, problems faced and their role in the dynamics of a city.
Sustainable Urbanization: Bridging the Green and Brown Agendas.
Technology and sustainability.

Teaching-Learning Process	Introduction to the course content through lectures. Workshop involving on ground experience to realise the impact of environment on public health.

Module-5

ENVIRONMENTAL IMPACT ASSESSMENT
Definition, need, objectives, scope, evolution, and its role in the planning process.
Methods, advantages, limitations.
Legal framework.
Assessment of impacts on land and human resources.

Teaching-Learning Process	Topic to be introduced by lectures. Guest Lecture on EIA reports and assessment procedure for several categories of projects.

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, Tests and Term Paper submission.

Semester End Examination:

Theory Examination shall be held for 3-hour duration, students are expected to answer FIVE full questions, one question from each module.

Suggested Learning Resources:

Books

1. Sustainable Urban Planning, Joy Sen
2. Ecological Meltdown, Asheem Srivastav & Suvira Srivastav
3. Urbanization, Environmental Degradation & Quality of life, H.M.saxena & M.Z.A. Khan
4. The hidden potential of sustainable neighbourhoods, Harrison Fraker
5. Environment & the developing world – principles, policies & management, Aviji9t Gupta & Mukul G. Asher
6. Adapting cities to climate change: understanding & addressing the developmental challenges, Jane Bicknell, David Dodman & David Satterthwaite
7. Environmental management, Vijay Kulkarni & T.V. Ramachandran
8. Principles of Terrestrial Ecosystem Ecology, F. Stuart Chapin III, Harold A. Mooney, and Pamela A. Matson

Web links and Video Lectures (e-Resources):

1. https://nptel.ac.in/courses/127106004
2. https://www.youtube.com/watch?v=lAvsymBnwug (Public Policy in the field of Environment: Opportunities and Challenges Dr. Sairam Bhatt)
3. https://www.youtube.com/watch?v=Ay4GmV8FOmA
4. https://www.youtube.com/watch?v=6h0dpQmCRmE
5. https://www.youtube.com/watch?v=aWPghGzsjOA

Skill Development Activities Suggested

1. Participatory approaches to problem solving through workshops.
2. Reading and interpreting EIA reports.
3. Understanding provisions in legal frameworks regarding environmental rights.
4. Reading various ecological layers in brown and green field sites and interpreting them.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Interpret various ecological layers in each site	V
CO2	Assess impact of development on ecology & importance of circular systems	IV
CO3	Evaluate environmental management strategies and participatory methods	IV
CO4	Comprehend the relation between public health & environment	III
CO5	Comprehend the Environmental Impact Assessment process and its significance	II

Program Outcome of this course

Sl. No.	Description	POs
1	Ability to assess the significance of ecological layer in defining the nature of habitat	2, 3, 6, 7, 8
2	Ability to understand the relationship between environmental systems and liveability	1, 2, 7, 8, 9, 10
3	Assess climate change challenges in habitats and evaluate suitable responses	2, 3, 4, 7, 8, 10
4	Familiarize with policies and mandates to evolve responsible habitat systems	1, 2, 3, 8, 10

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	-	-	1	3	2	2
CO2	2	3	3	1	-	2	2	3	1	2
CO3	3	3	3	1	-	3	3	3	3	1
CO4	2	3	3	1	1	3	3	3	1	2
CO5	3	2	2	1	-	2	2	3	1	2
Average	**2.6**	**2.8**	**2.6**	**1.2**	**0.2**	**2**	**2.2**	**3**	**1.6**	**1.8**

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**	**_**

PROJECT PLANNING, ANALYSIS & APPRAISAL/EVALUATION			
Course Code	**22HDS34**	CIE Marks	100
Teaching Hours/Week (L:P: SDA)	1:1:0	SEE Marks	-
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	-

Course Learning objectives:
To introduce the students to methods of implementation and management of projects related to Urban Infrastructure.

Module-1

INTRODUCTION TO PROJECT PLANNING
Introduction to terminologies and concepts of Project planning.
Urban Projects: Scales, Institutions involved and their organization structure.
Public relation and citizen participation: Personnel management, Manpower Planning, performance, appraisal, motivation and morale. Corporate Management: Systems approach to Urban Management, organizational design, management information systems.

Teaching-Learning Process	Introduction to various topics through lecture sessions Exercises of understanding various terminologies related to Project Planning

Module-2

LEGAL TOOLS CONNECTED WITH URBAN PLANNING AND DEVELOPMENT
Requirement Analysis, Feasibility Check and Techniques involved.
Operational Analysis: Performance, Business, Environment, Scenario Setting.
Identification and estimation of project impacts, Desirable and undesirable project impacts.
Cost Benefit Analysis. Identifying costs and benefits, Pricing, Opportunity costs, Shadow Prices, Cash flow, Payback periods and Internal Rate of Return

Teaching-Learning Process	Course content delivery through lectures. Through various cases, understanding concepts of Project Analysis. Comparative analysis of cases can be studied as seminar topics by students.

Module-3

METHODS OF PROJECT EVALUATION
Single and multiple criteria project evaluations
Details of single Criteria cost -benefit analysis and its application with case studies.
Concept of multi-criteria project evaluation and their applications: Concept of time scheduling, Project network and monitoring, PERT and CPM with their application in planning projects, Project monitoring under resource constraints

Teaching-Learning Process	Introduction to the course content through lectures. Comparative studies on project evaluations by taking up case studies

Module-4

LOCAL PLANNING AND BUDGETING
Methods of Urban Finance: Financial perspective of Urban Development.
Municipal Corporate Planning, Program Planning and Budgeting, Local Financial Management, Financial Control & Delegation, Performance evaluation techniques, Cash flow management, Local debt management, Financial Information System, Municipal fiscal programming, Project scheduling and budgeting.

Teaching-Learning Process	Introduction to the course content through lectures. Guest lecture/ Workshop to expose the ground realities & challenges in financial perspective of Urban Development.

Module-5

PROJECT IMPLEMENTATION PLAN
Project Implementation Techniques and Phasing
Technical Aspects of cost, schedule and quality of deliverables.
Human Aspects of Authority, orientation, Motivation and Group orientation.
Risk Management and Execution Plans.
New methods, practices and technological advancements in project Implementation- Best Practices.

Teaching-Learning	Topics to be introduced through lectures. Seminar topics on advancements in project Implementation.

Process	

Assessment Details (CIE)

The weightage of Continuous Internal Evaluation (CIE) is 100%. The minimum passing mark for the CIE is 50% of the maximum marks.

Continuous Internal Evaluation:

Continuous Internal Evaluation will be based on Assignments, Tests and Term Paper submission.

Suggested Learning Resources:

Books

1. Daniel Halpin and Ronald Woodhead, "Construction Management", Wiley, 2nd Edition, 1997.
2. Krishnamurthy and S.V.Ravindra, "Construction Management", CBS Publishers & Distributors Pvt. Ltd, 2nd Edition, 2017.
3. Prasanna Chandra, "Projects Planning, Analysis, Selection, Financing, Implementation and Review", McGraw-Hill, 8th Edition, 2017.
4. L S Srinath, "PERT and CPR-Principles and Application", Affiliated East-West Press, 2001.
5. Harold Kerzner, "Project Management", Wiley, New York, 2003.
6. Chitkara, "Construction Project Management", Tata McGraw- Hill, New Delhi.
7. Kamaraju Ramakrishna, "Essentials of Project Management", PHI Learning, New Delhi, 2010.

Web links and Video Lectures (e-Resources):

1. https://onlinecourses.nptel.ac.in/noc23_ce59/preview
2. https://onlinecourses.nptel.ac.in/noc23_mg124/preview
3. https://www.coursera.org/learn/uva-darden-project-management
4. https://execed.gsd.harvard.edu/integrated-project-management
5. https://www.udemy.com/course/practitioners-guide-to-cost-benefit-analysis/
6. https://www.youtube.com/watch?v=W2EdffbwgcM&list=PLyqSpQzTE6M88imldbh5qcexw-qXNikWR
7. https://www.youtube.com/watch?v=iHSEXPazWEg

Skill Development Activities Suggested

1. Project Simulation: Use project management software or tools to simulate the planning and execution of a project to manage tasks, resources, and timelines in a controlled environment.
2. Risk Assessment - to identify potential risks in a project, assess their impact and develop risk mitigation strategies.
3. Time Management on effective time management techniques, such as creating Gantt charts, using productivity tools, and setting milestones.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Familiarisation with project planning principles.	II
CO2	Develop comprehensive project proposals by defining project objectives, scope, and deliverables.	VI
CO3	Comprehend risk assessment and management.	II
CO4	Familiarisation with project planning techniques.	II
CO5	Applying tools for sustainability and social impact in project planning.	III

Program Outcome of this course

Sl. No.	Description	POs
1	Exposes the students about comprehensive project planning skills	1, 2, 3 ,5,7
2	Sensitize the students on feasibility, appraisal, evaluation and regulatory compliance adhering to legal requirements and industry best practices.	1, 2, 3, 7,10
3	Establish the corelation between Sustainable Urban Planning, Policy and Governance and Ethical Considerations in Urban Design.	1,2,3,6,7,8

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	1	-	3	2	1	3	1
CO2	3	2	3	2	2	3	1	2	1	2
CO3	1	2	3	2	1	3	3	3	2	1
CO4	2	2	3	3	2	1	2	1	2	3
CO5	-	1	2	3	2	3	3	3	2	2
Average	**1.8**	**1.8**	**2.2**	**2.2**	**1.4**	**2.6**	**2.2**	**2**	**2**	**1.8**

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**

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

DISSERTATION - I			
Course Code	**22HDS35**	CIE Marks	100
Teaching Hours/Week (L: P: SDA)	1:0:2	SEE Marks	-
Total Hours of Pedagogy	1	Total Marks	100
Credits	2	Exam Hours	-

Course Learning objectives:

The course intent is a research exploration based on an identified habitat theme/topic to lead to Dissertation-II project.

Module-1

The research project will be taken up by students individually.
Students develop their research based on the outline:

- Identifying the issue and formulating the research outline.
- Raise research questions.
- Formulate a methodology for research.
- Review of Theoretical Framework related to the identified theme/topic.
- Review of Literature through Case studies related to the identified theme/topic.
- Identifying the study site/area relevant to the theme selected.

Two seminars to be given by each student.

Teaching-Learning Process	Lecture sessions, Site visits, Student presentations, Group discussions, Periodic Reviews, Seminars, Workshops are part of the Teaching Learning Process.

Assessment Details (CIE)

The weightage of Continuous Internal Evaluation (CIE) is 100%. The minimum passing mark for the CIE is 50% of the maximum marks.

Continuous Internal Evaluation:

Continuous Internal Evaluation will be based on Reviews, Seminars, Report submission.

Suggested Learning Resources:

Books

1. Research Design in Urban Planning: A Student's Guide, Stuart Farthing
2. Doing Research in Urban and Regional Planning, Diana MacCallum, Courtney Babb, Carey Curtis
3. Design Research for Urban Landscapes-Theories and Methods, Martin Prominski, Hille Seggern

Web links and Video Lectures (e-Resources):

1. https://www.researchgate.net/publication/371713646_Research_Methods_in_Urban_Design_A_Framework_for_Researching_the_Performance_and_Resilience_of_Places
2. http://kth.diva-portal.org/smash/get/diva2:343485/FULLTEXT01.pdf
3. http://www.untagsmd.ac.id/files/Perpustakaan_Digital_1/CITIES%20PLANNING%20Urban%20design%20method%20and%20techniques.pdf
4. https://papers.cumincad.org/data/works/att/eef2.content.pdf

Skill Development Activities Suggested

1. Formulating Research project
2. Research Design
3. Literature Review methods
4. Technical writing

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Ability to identify areas for research in human habitat.	V
CO2	Ability to review literature comprehensively.	IV
CO3	Ability to assess gaps in literature as opportunity for research.	V
CO4	Generate research context for the identified theme/topic to progress into Dissertation-II Project.	VI
CO5	Ability to formulate Research methodology for the project.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Identify aspects of human habitat which require critical investigation.	1, 2, 3, 7, 8, 10
2	Comprehensive understanding of relationship between habitat components.	1, 2, 3, 7, 8
3	Formulating systematic approach to investigate habitat related issues.	2, 3, 6, 7, 8, 10
4	Holistic understanding of existing knowledge base related to the area of investigation.	1, 2, 3, 7, 8,

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	1	-	1	2	2	-	1
CO2	3	3	3	-	-	-	1	2	-	3
CO3	3	3	3	1	-	1	2	2	-	3
CO4	2	3	3	1	2	3	2	2	-	2
CO5	1	1	1	1	3	3	2	2	-	2
Average	**2.4**	**2.6**	**2.6**	**0.8**	**1**	**1.6**	**1.8**	**2**	**-**	**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**

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

Electives

REAL ESTATE DEVELOPMENT AND FINANCE			
Course Code	**22HDE361**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To familiarize students to the real-estate market mechanisms and their implications on the process of resource mobilization and city development

Course outline

- Introduction and history of Real-estate Development.
- Real-estate market and assessment techniques, economic cycles, demand and supply, values and rental structure and advertising.
- International investments and packaging, implications on Real estate market, public-private participation, and Real-estate development agencies.
- FDI in the real estate sector.
- Real estate laws, rent control laws and other legal frameworks.
- Investment and risk assessment techniques, market surveys and research, rating system in Real-estate market.
- Infrastructure development and quality control, Post development management and maintenance in Real-estate development.
- Impacts on urban form.
- Good practices in the development of Real estate through case studies.
- Documentation of Real-estate practices in India and foreign markets.

Teaching-Learning Process	Introduction to the course content through lectures. Comparative studies/ Case studies /Seminar/Guest lecture

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 Exercises, Projects, Seminars
Semester End Examination: Viva Voce

Suggested Learning Resources:
Books

1. Michael Ball, Colin Lizieri, Bryan D. Macgregor, “The Economics of Commercial Property Markets”, Routledge, 1st Edition, 1998.
2. Adrienne Schmitz, Deborah L Brett, “Real Estate Market Analysis: A Case Study Approach”, Urban Land institute, 2nd Edition, 2001.
3. Mike E. Miles, Laurence M. Netherton, Adrienne Schmitz, "Real Estate Development: Principles and Process", Urban land institute, 5th Edition, 2015.
4. Prashant Das and Divyanshu Sharma, "Real Estate Finance in India", Sage Publications, 2013.
5. CA Madhukar Hiregang, CA Virender Chauhan, CA Sudhir V S and CA Roopa Nayak,"A Practical Guide to GST on Real Estate Industry" , Bloomsbury, 2019. Daniel Halpin and Ronald Woodhead, “Construction Management”, Wiley, 2nd Edition, 1997.
6. Krishnamurthy and S.V.Ravindra, “Construction Management”, CBS Publishers & Distributors Pvt. Ltd, 2nd Edition, 2017.
7. Prasanna Chandra, “Projects Planning, Analysis, Selection, Financing, Implementation and Review”, McGraw-Hill, 8th Edition, 2017.
8. L S Srinath, “PERT and CPR-Principles and Application”, Affiliated East-West Press, 2001.
9. Harold Kerzner, “Project Management”, Wiley, New York, 2003.

10. Chitkara, “Construction Project Management”, Tata McGraw- Hill, New Delhi.
11. Kamaraju Ramakrishna, “Essentials of Project Management”, PHI Learning, New Delhi, 2010.

Web links and Video Lectures (e-Resources):

1. https://professional.mit.edu/course-catalog/professional-certificate-program-real-estate-finance-development`
2. https://execed.gsd.harvard.edu/real-estate-development-fundamentals
3. https://www.youtube.com/watch?v=SBZGsjL4uWo
4. https://www.youtube.com/watch?v=0kAhcWemp9M

Skill Development Activities Suggested

1. Assessing Real Estate Markets
2. Conduct market research and analysis for different habitat situations.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend the relation of real estate, infrastructure, and finance.	II
CO2	Critically evaluate how real estate and habitat interact and influence each other.	V
CO3	Explore good practices in real estate development.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Knowledge of best practices in real estate systems.	1, 2, 7, 8 ,10
2	Holistic approach to real estate management	2, 3, 4 ,7, 8
3	Document real estate practices in India and abroad.	1, 2, 3 ,5, 7, 8 ,10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	2	3	-	2
CO2	2	3	3	2	-	1	2	3	-	2
CO3	2	2	3	3	1	1	2	3	1	2
Average	**2.3**	**2.3**	**2.6**	**2**	**0.3**	**1**	**2**	**3**	**0.3**	**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**

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

STRATEGY MANAGEMENT AND IMPLEMENTATION OF PROJECTS			
Course Code	**22HDE362**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To aid the student in development of strategic vision, setting out objectives, formulating and implementing strategies

Course outline

- Concepts of Strategy management.
- Principles, techniques, and study of various models.
- Business Perspective- Organizational chart.
- Policy Perspective- policies, program, and rules.
- Design Perspective- Tactical planning, Deployment of resources.
- Measures to stay informed and respond to trends in competition and technology while not losing sight of the strategic objective.
- Concepts, value of vision, mission and corporate objectives, the role of corporate governance and stakeholder management, coherence in strategic direction.
- Understanding the classic theories and frameworks involved in the project.
- Understand different options of implementation plan through case studies and best practices.
- Arriving at goals and metrics.
- Aligning the strategic principles, organization structure, principles and features that influence strategy execution, key actions, and challenges.
- Exploring the risks and other resistance for the project and ways to address them.
- Arriving at the Implementation module, implementation plans.
- Strategic evaluation of the project- Analysis and assessment.

Teaching-Learning Process	Introduction to the course content through lectures. Comparative studies/ Case studies /Seminar/Guest lecture involving ground experience

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 Exercises, Projects, Seminars
Semester End Examination: Viva Voce

Suggested Learning Resources:
Books

1. Michael Ball, Colin Lizieri, Bryan D. Macgregor, “The Economics of Commercial Property Markets”, Routledge, 1st Edition, 1998.
2. Adrienne Schmitz, Deborah L Brett, “Real Estate Market Analysis: A Case Study Approach”, Urban Land institute, 2nd Edition, 2001.
3. Mike E. Miles, Laurence M. Netherton, Adrienne Schmitz, "Real Estate Development: Principles and Process", Urban land institute, 5th Edition, 2015.
4. Prashant Das and Divyanshu Sharma, "Real Estate Finance in India", Sage Publications, 2013.
5. CA Madhukar Hiregang, CA Virender Chauhan, CA Sudhir V S and CA Roopa Nayak,"A Practical Guide to GST on Real Estate Industry" , Bloomsbury, 2019. Daniel Halpin and Ronald Woodhead, “Construction Management”, Wiley, 2nd Edition, 1997.
6. Krishnamurthy and S.V.Ravindra, “Construction Management”, CBS Publishers & Distributors Pvt. Ltd, 2nd Edition, 2017.
7. Prasanna Chandra, “Projects Planning, Analysis, Selection, Financing, Implementation and Review”,

McGraw-Hill, 8th Edition, 2017.
8. L S Srinath, "PERT and CPR-Principles and Application", Affiliated East-West Press, 2001.
9. Harold Kerzner, "Project Management", Wiley, New York, 2003.
10. Chitkara, "Construction Project Management", Tata McGraw- Hill, New Delhi.
11. Kamaraju Ramakrishna, "Essentials of Project Management", PHI Learning, New Delhi, 2010.

Web links and Video Lectures (e-Resources):

1. https://archive.nptel.ac.in/courses/122/105/122105024/
2. https://archive.nptel.ac.in/courses/110/108/110108047/
3. https://onlinecourses.nptel.ac.in/noc22_mg89/preview
4. https://www.coursera.org/learn/strategic-management
5. https://pll.harvard.edu/course/business-strategy-evaluating-and-executing-strategic-plan

Skill Development Activities Suggested

1. Leadership training
2. Knowledge about corporate governance
3. Understanding implementation plan through case studies and best practices

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Comprehend basic concepts of Strategy management.	III
CO2	Critically evaluate implementation plan of urban development projects.	V
CO3	Explore the classic theories and frameworks involved in the project.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Knowledge of best practices in strategy management	1, 2, 6, 7,10
2	Holistic approach to various models, perspectives, theories involved in strategic management.	2, 3, 4 ,7, 8
3	Analysis and assessment of implementation of urban projects	1, 2 , 7, 8 ,10

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	-	1	2	3	-	2
CO2	2	3	3	2	-	1	2	3	-	2
CO3	2	2	3	3	1	1	2	3	1	2
Average	**2.3**	**2.3**	**2.6**	**2**	**0.3**	**1**	**2**	**3**	**0.3**	**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**

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

PARAMETRIC DESIGN

Course Code	**22HDE363**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	0:2:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:
To introduce explorative and creative thinking expressed through the application of digital software to design propositions. To develop the ability to use digital software for the development and execution of a Parametric designs

Course outline

The course will focus on the design and development of urban spaces using parametric design software's and digital design tools. This Design process will be collaborative, iterative and with an evolutionary vector framework. There will be emphasis on diagramming in analysis and data mapping, followed by their translation into parametric platforms.
These platforms are powerful design tools that augments the design and execution process. Based on the studio objectives, appropriate vector-oriented software are chosen as a designing tools.
Creative design outcomes are to be developed in a digital environment with reference to appropriate parametric software used for designing a building typology.
The studio will focus on parametric design process and will demonstrate link between habitat that will augment the character of a specific built environment. Students will work on above mentioned in detail and will submit the work in the form of drawings and/ models and supplementary documentation as found suitable to explain the design process and product judiciously

Teaching-Learning Process	Introduction to the course content through lectures. Lab exercises

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 Exercises, Projects, Seminars
Semester End Examination: Viva Voce

Suggested Learning Resources:
Books

1. Parametric Modeling with Autodesk Fusion 360: Spring 2020 Edition 1st Edition by Randy Shih
2. Parametric Methods for Beginners 1st Editionby Umut Toker
3. Digital and Parametric Architecture (eVolo Book 6) Kindle Edition by Carlo Aiello
4. Abruzzo, Emily et al. Models. 2008, New York, NY: 306090 Press.
5. Aranda, Benjamin and Christopher Lasch. Tooling. 2005, New York: Princeton Architectural Press.
6. Garcia, Mark (ed.), The Patterns of Architecture: Architectural Design. 2009, London: Wiley.
7. Gramazio, Fabio and Matthias Kohler, Digital Materiality in Architecture, 2008, Basel: Lars Mueller.
8. Guidot, Raymond (ed.), Industrial Design Techniques and Materials. 2006, London: Flammarion.
9. Kolarevic, Branko. Architecture in the Digital Age: Design and Manufacturing. 2005: New York: Taylor & Francis.
10. Lally, Sean, Energies: New Material Boundaries: Architectural Design. 2009, London: Wiley.
11. Meredith, Michael. From Control to Design:Parametric/Algorithmic Architecture, 2008, New York, NY: Actar Publishing.

Web links and Video Lectures (e-Resources):

1. www.youtube.com/channel/UCFwIL20fwOmTUkxJgOPk5Jg
2. www.udemy.com/course/develop-parametric-architecture-with-grasshopper/
3. Tthinkparametric.com/
4. online.stanford.edu/courses/cee220c-parametric-design-and-optimization

Skill Development Activities Suggested

1. Advanced software skills on parametric software's such as Rhino and Grasshopper
2. Problem based learning exercises.
3. Real time exercises.

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 parametric software	I
CO2	Analysing urban spaces using parametric software's analysis	II
CO3	Understanding the software as an innovative tool for urban analysis	VI
CO4	Creation of maps for habitats	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Understand parametric design as a crucial tool in Habitat data analysis.	1, 2, 6, 7,10
2	Creating base maps and carry out research and analysis	2, 3, 4 ,7, 8
3	Spatial representation of various types of data related to habitats.	1, 2 , 7, 8 ,10

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	1	-	-	-	-	1	3
CO2	2	1	3	3	1	2	-	-	-	-
CO3	1	3	3	3	2	1	2	2	1	3
CO4	2	2	3	3	2	1	2	2	3	3
Average	**2**	**1.7**	**2.2**	**2.5**	**1.2**	**4**	**1**	**1**	**1.2**	**2.2**

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**

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

DISASTER MANAGEMENT

Course Code	**22HDE364**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:

To understand the importance of Disaster Risk Mitigation, Reduction and Vulnerability within habitat systems.

Course outline

Introduction to Natural and man-made disasters. Conceptual approach to disaster management. Hazard & Vulnerability identification in Urban Context. Urban disaster risks, perspectives and approaches. Forecasting of disaster in urban context. Vulnerability Mapping and Assessment.

Urban disaster impact and role of urban planning in risk mitigation. Environmental impact of urban risks. Urban Transport as a factor in disaster risk reduction. Health issues due to urban disasters. Climate Change emergencies, pandemics, and their impact

Introduction to urban development policies and governance in urban disaster mitigation. Techno- legal framework for urban risk Reduction. Mitigation framework & measures for both structural and nonstructural safety: Earthquakes, Urban Flooding, coastal degradation and Urban Fires. Introduction to National Building code for risk management in buildings

Risk identification, assessment and vulnerability analysis and mitigation strategies of urban areas. National and international case studies.

Introduction to policies and frameworks for urban risk management. Community participation in risk management. Use of technology in disaster mitigation and management. Role of various agencies like NDMA, NIUA, and SIUD etc.

Teaching-Learning Process	Introduction to the course content through lectures. Guest lectures, case studies, seminars and group discussions with experts are part of Teaching Learning process.

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 Exercises, Projects, Seminars

Semester End Examination: Viva Voce

Suggested Learning Resources:

Books

1. National research council. Mitigating Shore Erosion Along Sheltered Coasts, Washington, DC: National Academies Press, 2007
2. Sener, S.M., C.A. Brebbia& O. Ozcevik. Disaster Management & Human Health Risk IV, 2015.
3. Osti, Rabindra, and K. Miyake. Forms of Community Participation in Disaster Risk Management Practices. New York: Nova Science Publishers, 2011.
4. Singh, Jagbir. Biodiversity Environment & Sustainability, New Delhi: M D Publications Pvt. Ltd, 2008

Web links and Video Lectures (e-Resources):

1. https://nptel.ac.in/courses/105104183
2. https://archive.nptel.ac.in/courses/105/104/105104183/
3. https://onlinecourses.nptel.ac.in/noc19_ar12/preview
4. https://www.my-mooc.com/en/mooc/disaster-management/

Skill Development Activities Suggested

1. Ability to evaluate policies for disaster-resilient growth.
2. Analytical skills to study disaster-prone areas.
3. Strategy Formulation for urban disaster mitigation.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understanding concepts of disaster management	I
CO2	Analysing issues and concerns related to urban risk impact	II
CO3	Understanding action plans and strategies in urban disaster mitigation	VI
CO4	Creation of framework for building resilient cities	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Understand disaster management as a crucial tool in urban disaster mitigation.	1, 2, 6, 7,10
2	Creating awareness for disaster-resilient growth.	2, 3, 4 ,7, 8

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	1	-	-	-	-	1	3
CO2	2	1	3	3	1	2	-	-	-	-
CO3	1	3	3	3	2	1	2	2	1	3
CO4	2	2	3	3	2	1	2	2	3	3
Average	**2**	**1.7**	**2.2**	**2.5**	**1.2**	**4**	**1**	**1**	**1.2**	**2.2**

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**

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

ENVIRONMENTAL PLANNING SYSTEMS

Course Code	**22HDE365**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	1:1:0	SEE Marks	50
Total Hours of Pedagogy	2	Total Marks	100
Credits	2	Exam Hours	Viva Voce

Course Learning objectives:

To Understand fundamentals of environmental planning and integration of environmental sustainability into habitats through policy, planning, and management of environmental systems.

Course outline

- Introduction to Urban climate and heat island,
- Soils, plant communities, ecosystem, ecology, and succession
- Urban Forestry, agriculture, and urban greening,
- Landscape ecology, Habitat Conservation Planning,
- Endangered Species Act
- Ecosystem planning processes.
- Fundamentals of surface and groundwater hydrology
- Integrating water and planning, such as stormwater management, source water/ groundwater protection, residential water conservation, water supply management,
- Water pollution control, and Clean Water Act compliance
- Key concepts and terminology for understanding environmental systems.
- Scientific fundamentals needed to understand professional documents, legal requirements, and planning best practices.

Teaching-Learning Process	Introduction to the course content through lectures. Field trips, Mapping, Data collection

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 Exercises, Projects, Seminars

Semester End Examination: Viva Voce

Suggested Learning Resources:

Books

1. John Randolph. 2012. Environmental Land Use Planning and Management, Second Edition.
2. Merchant, Carolyn. 1994. Ecology: Key Concepts in Critical Theory, Humanities Press, New Jersey.
3. Bicker, Alan, Paul Sillitoe and Johan Pottier. 2004. Development and Local Knowledge: New Approaches to Issues in Natural Resources Management, Conservation and Agriculture. Routledge, London & New York.

Web links and Video Lectures (e-Resources):

1. https://archive.nptel.ac.in/courses/120/108/120108004/
2. https://onlinecourses.nptel.ac.in/noc21_hs83/preview
3. https://onlinecourses.nptel.ac.in/noc21_ge16/preview
4. https://archive.nptel.ac.in/courses/127/105/127105018/

Skill Development Activities Suggested

1. Ability to evaluate policies & legal framework for environmental management.
2. Analytical skills to study disaster-prone areas.
3. Strategy Formulation for urban disaster mitigation.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Understanding key laws and regulations that regulate urban environmental management	III
CO2	Analysing how to apply scientific principles to plan making and review process	IV
CO3	Understanding professional domains that work in urban environmental planning	V

Program Outcome of this course

Sl. No.	Description	POs
1	Integration of environmental sustainability into habitats from the perspective of environmental planning, and management	1, 2, 6, 7,10
2	Acquire data skills to be able to environmentally characterize sites.	1 ,2, 6 ,7, 8,10

Mapping of COs and POs

	PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	1	-	2	2	1	1	3
CO2	2	3	2	1	1	2	2	-	-	3
CO3	3	1	2	1	2	2	2	2	1	3
Average	**2.6**	**1.6**	**1.3**	**1**	**1.2**	**2**	**2**	**1**	**1.2**	**3**

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**

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

INTERNSHIP			
Course Code	**22HDI37**	CIE Marks	50
Teaching Hours/Week (L: P: SDA)	-	SEE Marks	50
Total Hours of Pedagogy	-	Total Marks	100
Credits	3	Exam Hours	Viva Voce

Course Learning objectives:
The Internship is intended to be an introduction to the various dimensions of professional practice.

Course Outline

Students are expected to work in firms handling projects of following nature-

1. Large scale projects like layouts, housing complexes, campus masterplans involving multiple buildings, site planning.
2. Urban infill projects.
3. Urban Brown field projects.
4. Revitalization projects of decaying parts of the city.
5. Development of settlement masterplan
6. Heritage habitat conservation

The student is expected to familiarize himself/herself in the design decision making process involving urban issues and parameters in the design of settlements.
The student is expected to familiarize himself/herself with the following-
a) Administration of office b) Soliciting and obtaining projects c) Client meetings d) Site visits e) Drawings and detailing f) Design process and presentation.
For the viva-voce exam, the following need to be presented by the student-

a) Statement indicating the various types of works completed by the student in the firm.
b) Daily log maintained by the student.
c) Drawings/ Reports of projects on which the student has worked.
d) Photographs of project sites.
e) Any other material in support of student's involvement in the work.

Internship duration of **Six weeks** (36 days) should immediately precede the commencement of regular course work of Third semester.

Teaching-Learning Process	Exposure to profession and work experience in a firm/organisation engaging in works as identified in the curriculum.

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: Intermittent Reports, Portfolio
Semester End Examination: Viva Voce

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Acquire practical industry experience.	V
CO2	Apply knowledge and skills gained through internship back into studio.	III
CO3	Identify areas for future knowledge and skill development.	V
CO4	Expand intellectual capacity, credibility, judgment, intuition.	V
CO5	Acquire the knowledge of administration, marketing, finance and economics.	V

Program Outcome of this course

Sl. No.	Description	POs
1.	Assimilate practical approaches to habitat issues.	2, 4, 5, 7, 8, 9, 10
2.	Familiarise with the professional aspects & practice	2, 6, 7, 8, 9, 10
3.	Inculcate skills to pursue the profession	2, 3, 4, 6, 9, 10

Mapping of COS and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	2	2	1	2	3	1
CO2	1	1	-	3	1	3	2	2	1	3
CO3	2	-	-	3	-	-	2	2	2	2
CO4	1	2	2	-	1	3	3	3	2	3
CO5	2	2	1	3	1	3	3	3	3	3
Average	**1.8**	**1.6**	**1**	**2.2**	**1**	**2.2**	**2.2**	**2.4**	**2.2**	**2.4**

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**

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

IV Semester

DISSERTATION - II			
Course Code	**22HDC41**	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	2: 16: 4	SEE Marks	50
Total Hours of Pedagogy	18	Total Marks	100
Credits	20	Exam Hours	Viva Voce

Course Learning objectives:

The studio focuses on project formulation strengthened by relevant research and synthesis of design solution for the identified habitat theme.

The dissertation is the complete assimilation of academic and professional experience of the student.

- The scope of the dissertation will encompass the study of habitat issues, current dilemmas in the urban-scape and the related theoretical framework, culminating in Design.
- The dissertation would examine social, physical, economic, environmental, urban conservation issues with participatory and infrastructure provision-led objectives.
- The project definition, program development, design development process and implementation framework to form integral part of the project.

Each student is required to select and work on an area/ topic approved by the Institution.
Topic should be based on current issues, research and professional interests.
Format and guidelines shall be as laid down by the Institution.

Teaching-Learning Process	Lecture sessions, Site visits, Student presentations, Group discussions, Periodic Reviews, Seminars, Workshops are part of the Teaching Learning Process.

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 Internal Reviews, External Reviews, Seminars, Report and Portfolio Submission.

Semester End Examination: Viva-Voce exam

Suggested Learning Resources:

Books

1. Design Thinking, Peter Rowe
2. The Elements of Technical Writing, Gary Blake, Robert W. Bly
3. Research Design in Urban Planning: A Student's Guide, Stuart Farthing
4. Doing Research in Urban and Regional Planning, Diana MacCallum, Courtney Babb, Carey Curtis
5. Design Research for Urban Landscapes-Theories and Methods, Martin Prominski, Hille Seggern

Web links and Video Lectures (e-Resources):

1. https://www.researchgate.net/publication/371713646_Research_Methods_in_Urban_Design_A_Framework_for_Researching_the_Performance_and_Resilience_of_Places
2. http://kth.diva-portal.org/smash/get/diva2:343485/FULLTEXT01.pdf
3. http://www.untagsmd.ac.id/files/Perpustakaan_Digital_1/CITIES%20PLANNING%20Urban%20design%20method%20and%20techniques.pdf
4. https://papers.cumincad.org/data/works/att/eef2.content.pdf

Skill Development Activities Suggested

1. Research Design
2. Literature Review methods
3. Critical Analysis
4. Design Thinking
5. Technical writing

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Students develop skills to generate research context for the identified theme/topic to progress into project.	V
CO2	Ability to accomplish Contextual studies relevant to the project.	V
CO3	Ability to apply appropriate representation techniques to communicate the studies.	VI
CO4	Generate solutions through design demonstration.	VI
CO5	Assess Impact of development on habitat systems.	VI

Program Outcome of this course

Sl. No.	Description	POs
1	Assess habitat systems and identify issues.	1, 2, 3, 4, 6, 7, 8
2	Formulate critical approach to assess issues and evolve framework for study.	2, 3, 4, 5, 6, 7, 8
3	Generate solutions for the identified issues within the settlement.	3, 4, 5, 6, 7, 8, 10

Mapping of COs and POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	2	-	1	2	2	1	1
CO2	3	3	3	2	-	1	2	2	2	2
CO3	1	2	3	3	2	-	-	-	1	2
CO4	2	2	3	3	3	3	3	3	1	2
CO5	1	3	3	2	2	3	3	3	2	2
Average	**2**	**2.6**	**3**	**2.4**	**1.4**	**1.6**	**2**	**2**	**1.4**	**1.8**

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**

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