

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.**

**SCHEME OF TEACHING AND EXAMINATION OF I SEM M.ARCHITECTURE (Urban Design), CBCS Scheme & OBE -2020**

Sl No	Course	Subject Code	Title of Subject	Scheme of Teaching Periods per week ( 1 Period = 60 Mins.)				Scheme of Examination					Credits
				Theory (Lecture)	Studio (Practical)	Skill Develop- ment Activities	Total	Duration in Hours	CIE (%)	SEE(%)		Total (%)	
										Theory	Viva		
1	Core Course	20UDC11	Urban Design Studio-I	2	8	12*	10	Min. 20 Mins Per Student	40	0	60	100	12
2	Core Course	20UDC12	Urban Design Principles and Techniques	0	4	0	4	0	100	0	0	100	2
3	Core Course	20UDC13	Theory of Urban Form	2	1	1	4	3	40	60	0	100	3
4	Support Course	20UDS14	City Planning Process in India	2	1	1	4	3	40	60	0	100	3
5	Support Course	20UDS15	Social Theory in Urban Design	2	1	1	4	3	40	60	0	100	3
6	Core Elective	20UDE16A	Indian Urbanism	1	1	1	3	0	100	0	0	100	2
7		20UDE16B	GIS - I										
8	Professional Multi Disciplinary Elective	20UDE16C	Introduction to Spatial Analysis Software	1	1	1	3	0	100	0	0	100	--
			Total	9	16	4	29	-	360	180	60	600	25

**UDC: Urban Design Core Course**

**UDS: Urban Design Supporting Course**

**UDE: Urban Design Elective Course**

**Note:**

- 1 Lecture(Theory) Hours - **1 Credit**      2 Studio(Practical) Hours - **1 Credit**      2 Workshop(SDA) Hours - **1Credit**
- Minimum Marks of Passing: Progressive Marks - **50%**, Theory Marks - **40%** and Viva Marks - **50%**.
- One Elective is Mandatory. Student has to take either 20UDE16A or 20UDE16B
- 20UDE16C is an Non Credit mandatory Course . All NCMC will not have credits but will be acknowledged against the attendance and title reflected in the Marks cards.
- \*SDA Hours for 20UDC11 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated.
- Multidisciplinary Elective can be offered through offline and online mode.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.**

**SCHEME OF TEACHING AND EXAMINATION OF II SEM M.ARCHITECTURE (Urban Design), CBCS Scheme & OBE -2020**

Sl No	Course	Subject Code	Title of Subject	Scheme of Teaching Periods per week ( 1 Period = 60 Mins.)				Scheme of Examination					Credits
				Theory (Lecture)	Studio (Practical)	Skill Develop- ment Activities	Total	Duration in Hours	CIE (%)	SEE(%)		Total (%)	
										Theory	Viva		
1	Core Course	20UDC21	Urban Design Studio-II	2	8	12*	10	Min. 20 Mins Per Student	40	0	60	100	12
2	Core Course	20UDC22	Urban Conservation	2	1	1	4	3	40	60	0	100	3
3	Support Course	20UDS23	Urban Design Policy & Implementation	1	0	2	3	0	100	0	0	100	2
4	Support Course	20UDS24	Research Methodology	3	0	0	3	3	40	60	0	100	3
5	Support Course	20UDS25	Ecology & Site Planning	2	1	1	4	3	40	60	0	100	3
6	Core Elective	20UDE26A	Public Participation in Governanace	1	1	1	1	1	100	0	0	100	2
7		20UDE26B	Sustainable Urban Design Practices										
8	Professional Multi Disciplinary Elective	20UDE26C	Urban Management	1	1	1	3	0	100	0	0	100	--
			Total	11	11	5	27	-	360	180	60	600	25

**UDC: Urban Design Core Course**

**UDS: Urban Design Supporting Course**

**UDE: Urban Design Elective Course**

**Note:**

- 1 Lecture(Theory) Hours - **1 Credit**      2 Studio(Practical) Hours - **1 Credit**      2 Workshop(SDA) Hours - **1Credit**
- Minimum Marks of Passing: Progressive Marks - **50%**, Theory Marks - **40%** and Viva Marks - **50%**.
- One Elective is Mandatory. Student has to take either 20UDE26A or 20UDE26B
- 20UDE26C is an Non Credit mandatory Course . All NCMC will not have credits but will be acknowledged against the attendance and title reflected in the Marks cards \*SDA Hours for 20UDC21 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated.
- Multidisciplinary Elective can be offered through offline and online mode.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.**

**SCHEME OF TEACHING AND EXAMINATION OF III SEM M.ARCHITECTURE (Urban Design), CBCS Scheme & OBE -2020**

Sl No	Course	Subject Code	Title of Subject	Scheme of Teaching Periods per week ( 1 Period = 60 Mins.)				Scheme of Examination					Credits
				Theory (Lecture)	Studio (Practical)	Skill Development Activities	Total	Duration in Hours	CIE (%)	SEE(%)		Total (%)	
										Theory	Viva		
1	Core Course	20UDC31	Urban Design Studio-III	2	12	6*	14	Min. 20 Mins Per Student	40	0	60	100	11
2	Core Course	20UDC32	Dissertation Seminar	2	1	1	4	0	100	0	0	100	3
3	Core Course	20UDC33	Contemporary Theories of Urbanism & Architecture	2	1	1	4	3	40	60	0	100	3
4	Support Course	20UDS34	Infrastructure & Transportation Planning	2	1	1	4	3	40	60	0	100	3
5	Support Course	20UDS35	Urban Governance & Project Finance	2	1	1	4	3	40	60	0	100	3
6	Core Elective	20UDE36A	Urban Housing	1	1	1	3	0	100	0	0	100	2
7		20UDE36B	GIS - II										
8	Professional Multi Disciplinary Elective	20UDE36C	Data Analytics	1	1	1	3	0	100	0	0	100	--
9	Core - Internship	20UDI37	Professional Training	-	-	-	-	Min. 20 Mins Per Student	0	0	100	100	3
			Total	11	17	5	33	-	360	180	160	700	28

**UDC: Urban Design Core Course**

**UDS: Urban Design Supporting Course**

**UDE: Urban Design Elective Course**

**UDI- Core Internship**

**Note:**

- 1 Lecture(Theory) Hours - **1 Credit**      2 Studio(Practical) Hours - **1 Credit**      2 Workshop(SDA) Hours - **1Credit**
- Minimum Marks of Passing: Progressive Marks - **50%**, Theory Marks - **40%** and Viva Marks - **50%**.
- One Elective is Mandatory. Student has to take either 20UDE36A or 20UDE36B
- 20UDE36C is an Non Credit mandatory Course . All NCMC will not have credits but will be acknowledged against the attendance and title reflected in the Marks cards.
- All the students have to undergo mandatory internship of 8 weeks during the vacation between II and III semesters. A University examination shall be conducted during III semester and the prescribed internship credit shall be counted for the same semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. The students are required to submit periodic progress reports of the internship undertaken.
- \*SDA Hours for 20UDC31 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but

credits are allocated.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.**

**SCHEME OF TEACHING AND EXAMINATION OF IV SEM M.ARCHITECTURE (Urban Design), CBCS Scheme & OBE -2020**

Sl No	Course	Subject Code	Title of Subject	Scheme of Teaching Periods per week ( 1 Period = 60 Mins.)				Scheme of Examination					Credits
				Theory (Lecture)	Studio (Practical)	Skill Develop- ment Activities	Total	Duration in Hours	CIE (%)	SEE(%)		Total (%)	
										Theory	Viva		
1	Core Course	20UDC41	Dissertation	2	21	15*	23	Min. 20 Mins Per Student	40	0	60	100	20
2	Core Elective Course	20UDE42A	Politics of Development	1	1	1	3	0	100	0	0	100	2
3		20UDE42B	Urban Economics										
			Total	3	22	1	26	-	140	0	60	200	22
UDC: Urban Design Core Course				UDE: Urban Design Elective Course									
Note:													
1. Lecture(Theory) Hours - <b>1 Credit</b> 2 Studio(Practical) Hours - <b>1 Credit</b> 2 Workshop(Skill Development Activities) Hours - <b>1Credit</b>													
2. Minimum Marks of Passing: Progressive Marks - <b>50%</b> , Theory Marks - <b>40%</b> and Viva Marks - <b>50%</b> .													
3. One Elective is Mandatory. Student have to choose 20UDE42A or 20UDE42B as elective subject													
4. *SDA Hours for 20UDC41 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated.													



**SEMESTER I**

<b>Code</b>	<b>20 UDC11</b>
<b>Subject</b>	Urban Design Studio- I
<b>Periods/Week</b>	10(L/P)*+12(SDA)**
<b>Viva Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	12

*\*L-Lecture, P-Practical, SDA- Skill Development Activities*

*(\*\*SDA Hours for 20UDC11 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated)*

**Goal and Objective:**

The goal of this first studio shall be to understand that urban design at its core is a connective discipline. The objective shall be to understand, organize and synthesize in visual, tactile and measurable ways sustained improvements in the places that make up our urban living environment.

**Outline:**

The studio will incorporate interdisciplinary principles, processes and interactions that are fundamental to Urban Design. The studio tasks will include the following;

1. Documenting, analyzing and understanding textures and places that make an urban area.
2. Understanding the nature of interrelation between non formal and formal issues connected with intervention into urban fabric.
3. To identify and learn basic urban design tools.
4. To implement the same in a project of either single use or multiuse built structure.

Project I will consist of documenting , analyzing and evolving proposals for urban components like streets, public open spaces, public gathering places, precincts of historically important buildings in the city. The focus will be on understanding the concepts of “Fabric, Texture and Weave”.

Project II will focus on the goals and objectives of “intervention to improve”. The project will identify a specific area in an identified city to understand the process of documenting the true picture of the area and creating scenarios which will clearly demonstrate the needs of intervention to improve. The project will end with the design of multi or single use built forms.

**Outcome:** Students should be able to demonstrate

- To read/document, understand, analyse, synthesize the complexity of formal and informal urban environment.
- Learn basic Urban design tool to analyse, identify issues and design solution

<b>Code</b>	<b>20UDC 12</b>
<b>Subject</b>	Urban Design Principles and Techniques
<b>Periods/Week</b>	4 (Studio)
<b>Exam Marks</b>	-
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

The objective of the course is to introduce students to the methods of reading and understanding the physical fabric of a city.

**Outline:**

1. Definition and scope of urban design. Introduction to the process and profession of Urban Design, differences and similarities between urban planning and urban design.
2. Fundamental hypothesis: the study of building typology in relation to the city, Concepts of Aldo Rossi.
3. The street, Square, façade & typologies of sections and elevations, the works of Rob Krier.
4. City as a visual matter, philosophy of perception, comprehension of the environment through visual examination, Serial vision, place, content, etc based on the concepts of Gordon Cullen. Perception of movement and clarity/ legibility in the cityscapes, Concepts of Kevin Lynch.
5. Pattern language of Christopher Alexander, City seen as a complex
6. Lattice and the underlying principles expressed in an abstract pattern.
7. Edmund Bacon's work on city design based on the movement system.
8. "Learning from Las Vegas" tools developed for analyzing the traditional urban spaces in a new kind of space.

**Outcome:** students should be able to demonstrate

- Ability to read the physical fabric and decipher their understanding of the city
- Ability to understand the different city theories and methodology adopted by urbanists.

**References:**

1. Broadbent, Geoffrey. Emerging Concepts of urban Design
2. Bacon, Edmund, N. Design of Cities.
3. Gosling, David & Maitland, Barry, Concepts of Urban design.
4. Morris, Anthony, J.E. History of Urban Form.
5. Kostof, Spiro, The City Assembled: The Elements of Urban Form Through History.
6. Kostof, Spiro, City Shaped: Urban Patterns and Meanings Through History

<b>Code</b>	<b>20 UDC 13</b>
<b>Subject</b>	Theory of Urban Form
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objective:**

The course is intended as a comprehensive study of urban form, processes and urban spaces in historical and theoretical terms.

**Outline:**

1. **Introduction to urban design** (ideology/theory) and the various concerns (scope and objectives) of the discipline; components of urban design and their inter-dependencies.
2. **Introduction to city/urban form-** morphology (significance of understanding Urban form and Urban Process). Various theoretical views associated with nature of city form (normative, positive, substantive and procedural theories); Cosmic, Machine and Organic Models; Descriptive and functional theories; Alternative theoretical postulations.
3. **Study of urban form** (Comparison between the various perspectives of studying and analyzing urban form- space; conservation and the life of urban form )
  - a. Urban space and form through history (overview)
    - Western context: The Early Cities (Neolithic, classical antiquity), Medieval Towns, Renaissance and Baroque Planning, Form of modern city and early cities of capitalism (industrialization and influences City beautiful movement, City and Garden, Camilo Sitte); Modern Movement (Tony Garnier, Corbusier, F L Wright, Arturo Soria Y Mata, Antonio Sant'Elia), post-World War II (Doxiades and Ekistics), Megastructure; Cities of sweat equity and highway; subsequent directions.
    - Indian Context: The Early Cities, Mughal and Medieval Towns, Temple Cities, Colonial influences, post-independence and modern cities (Chandigarh, Bhubaneshwar, Gandhinagar) and further developments.
  - b. Approaches to reading urban form and space (western, Islamic cities and influences)



- City as patterns; diagrams; spaces and ideas (organic; grid; political-functional-secularist-socialist diagrams; grand manner; skyline; city edge; urban division; public spaces- various typologies including street and parks); subsequent direction and further developments.

#### **4. Understanding Urban Process**

- Rise and fall of cities; disaster; destruction and reconstruction; Haussmanization; incremental changes; urban renewal; contemporary issues and phenomenon shaping urban form and space (sprawl, sustainable growth, transportation).

#### **5. Theorizing urban form** (introduction to modern, post-modern perspectives and influences)

- Utopias; ideas of Gordon Cullen, Jane Jacobs, William Whyte, Mumford, Kevin Lynch (Good City Form; Imageability and Memory), New Urbanism of Krier; Public and Private domains; Suburbs and periphery; Privacy, Territoriality and Proxemic theory; Defensible spaces; ideas of community through design; treatment of urban space; future of the city (contemporary practices and directions).

**Outcome:** students should proficient in

- Reading and understanding the complexity of urban form and space in historical and theoretical context of city
- Ideology and theory that involve and define urban design through history.
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#### **References:**

1. Spiro Kostof, the City Assembled, Thames and Hudson.
2. Spiro Kostof, The City Shaped, Thames and Hudson.
3. Jon Lang, Urban Design Typology and procedures, Architectural Press
4. A.E.J. Morris, History of Urban Form, Longman Scientific and Technical.
5. Kevin Lynch, Good City Form, MIT Press.
6. Edmund Bacon, Design of Cities.
7. Geoffrey Broadbent, Emerging Concepts of urban Design

<b>Code</b>	<b>20UDS 14</b>
<b>Subject</b>	City Planning Process in India
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objectives:**

1. To expose students to the process of city planning and implementation in India.
2. To learn about the institutional context of city planning including national, state and local level policies, legislations and regulations used to monitor, aid, manage and design the growth and transformations in cities.
3. To understand the issues impacting the physical, social, economic and ecological environment of cities and learn about new planning practices and strategies to address them.
4. To undertake a critical review of the planning, development and regulatory processes and practices shaping the Indian city.

**Outline:**

- **Introduction to city planning** - A historical overview of city planning in the Indian context and the goals of planning.
- **Scope and purpose of various plan types** - Perspective plans, regional plans / structure plans, and master plans / comprehensive development plans, local area plans, special purpose plans, annual plans, projects / schemes.
- **Planning legislations in India** - A review of national, state and local level policies, programmes, acts and regulations used to monitor, aid, manage and design the growth and transformations in cities.
- **Plan making process** – Case studies and articles on a) Planning in the regional context, master planning, visioning, development of policies; b) Techniques of data collection, mapping, survey, projection of requirements; preparation of base map, developmental plan proposals and delineation of zones; and c) Urbanisation challenges and assessment of developmental issues for sectors such as land use, transportation, ecology and environment, urban poor and urban design among others.
- **Land use zonal regulations I** – Land use zones; sub classification, permissible and prohibited activities, types of zoning, drawbacks of zoning;
- **Land use zonal regulations II** – Issues and limitations; FAR, TDR and floating FSI, incentive zoning and other regulatory mechanisms
- **Emerging planning strategies and concepts** - A review of a) the land pooling, urban renewal, conservation and redevelopment processes; and b) Concepts of smart growth, transit oriented design, growth management strategies, transit metropolis, new urbanism, advocacy planning, smart city etc.

- **Violations and informal development** - Appeals, appellant authority, and issues related to unauthorized and informal developments.
- **Implementation and monitoring modalities** - Public private and people partnerships; resource mobilization; plan monitoring and review; public participation; and zonal / ward level plans.
- **Critical review**– Discussion of alternatives to the master planning process in India.

**Outcome:** students should be proficient in

- Process of city planning in Indian cities
- Understand the policy and its influence in overall growth of the city
- Able to conduct critical review on planning and development process in Indian context.

**References:**

1. URDPFI Guidelines (<http://moud.gov.in/URDPFI>).
2. UDPFI Guidelines, Institute of Town Planners, India, Ministry of Urban Affairs and Employment. Government of India, New Delhi.
3. The Karnataka Town and Country Planning Act, 1961.
4. The Constitution (74th Amendment) Act, 1992.  
(<http://indiacode.nic.in/coiweb/amend/amend74.htm>)
5. Master Plans of Bangalore, New Delhi, Mumbai and other metropolitan Indian cities.
6. Taylor, John L and Williams, David G. *Urban Planning Practice in Developing Countries*, Pergamon Press, 1982. ISBN: 978-0080222257.
7. Selected readings provided in class.

<b>Code</b>	<b>20UDS15</b>
<b>Subject</b>	Social Theory and Urban Design
<b>Periods/Week</b>	4(L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	<b>3</b>

**Objective:**

The course introduces first semester students to conceptual and theoretical perspectives of urban social theory.

**Outline:****Classical Theoretical Perspectives:**

Karl Marx; (Capitalism and class); Friedrich Engels (Living conditions of the urban working class in post-industrialized towns); Ferdinand Tonnies (Community and Association), Emile Durkheim (Social solidarity); Georg Simmel (Urban experience, Social distance, Philosophy of money);Max Weber (Social structure of city and urban community).

**Contemporary Theoretical Perspectives:**

Robert Park (Human ecology, Symbiotic versus Societal organization, Dynamics and processes of human community: population, material culture (technological development), nonmaterial culture(customs and beliefs), Natural resources of the habitat, Societal pyramid, Differences between ecology and human ecology); Louis Wirth (urban theory on urbanism as a function of population density, size and heterogeneity); Ernest Burgess (Concentric Zone Theory); Homer Hoyt (Sector Theory); Harris and Ullman: Multiple Nuclei Theory).

**Political Economy:**

Political and economic forces in a society with reference to works of Henri Lefebvre; Michael Storper and David Walker; Manuel Castells; David Harvey; Logan and Molotch(City as Growth Machine);Saskia Sassen (Global City); John Friedmann (World City Hypothesis); Michael Dear (Los Angeles School/ Chicago School).

**Social Life in the Public Realm (Discourses in the West):**

Michel de Certeau (Everyday life in the city); Fredrick Law Olmsted (The civilizing effect of park space in cities); Richard Sennet (Fall of the Public Man); Wilson & Kelling (Broken Windows Theory); Carr et al. (The Nature of Public Life); Mike Davis (The Fortress LA: The Militarization of Public Space); William Whyte (Social life in small urban public spaces), Jane Jacobs (eyes on the street; sidewalk ballet).

**Outcome:** Students should be proficient in

- Understand the Different urban social theoretician and their theories and its influence on the city.
- Understand the social theory through timeline and its changing position.

**References:**

1. Borden, Iain, Tim Hall and Malcolm Miles (Eds.). 2003. *The City Cultures Reader* (Routledge).
2. Castells, Manuel. 1978. *City, Class and Power (Sociology, politics & cities)*(Palgrave Macmillan).
3. Davis, Mike. 1990. *City of Quartz: Excavating the Future in Los Angeles* (Verso).
4. Harvey, David. 2001. *Spaces of Capital: Towards a Critical Geography* (Blackwell/Wiley).
5. Harvey, David. 2000. *Spaces of Hope*(University of California Press).
6. Jacobs, Jane. 1961. *The Death and Life of Great American Cities* (Vintage).
7. Lin, Jan and Christopher Mele (eds.).2012. *The Urban Sociology Reader* (Routledge).

<b>Code</b>	<b>20UDE16A</b>
<b>Subject</b>	Indian Urbanism-Core Elective
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Viva Marks</b>	--
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

The course is intended to develop an understanding of key issues of urbanism in India, its dilemmas, ideologies and the new patterns that it has taken with neo-liberalism.

**Outline:**

The course covers on issues of Indian urbanism related to polity and colonial legacy, ideology of tenure and exchange, environment and water, daily life and informal sector, gender, art and media in the city. The course would be conducted through readings, discussions and invited lectures covering case studies and published research works.

**Outcome:** students should be proficient in

- Understanding of issues of urbanism in india and its new pattern through present

**References:**

1. K. Sivaramakrishnan and Arun Agrawal (Edit), Regional Modernities: The Cultural Politics of Development in India, Stanford University Press, 2003.
2. Kenneth R Hall (Edit), Structure and Society in early South India, Oxford University Press, 2004.
3. Malcolm Miles and Tim Hall (Eds), The City Cultures Reader, Routledge Taylor & Francis Group, 2004.
4. Partha Chatterjee, The Politics of the Governed, New York: Columbia University Press, 2004.
5. Reader compiled by course instructor.

<b>Code</b>	<b>20 UDE16B</b>
<b>Subject</b>	GIS-I Professional Elective
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Viva Marks</b>	---
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

*The course is intended to understand GIS as a decision-support tool in urban spatial planning process. It introduces basic, practical understanding of GIS concepts, techniques and real world applications in spatial planning.*

*It also establishes a bridge between the conceptual realms - Architecture /Site - Terrain Analysis/ Landscape architecture/Urban Design and Urban planning. Output being digital, online and printed maps.*

**lecture and hands on lab exercises:** *Students will complete lab exercises using any good Spatial information systems software such as QGIS/ Global mapper/ Autocad MAP3D/ ArcExplorer with Any DBMS.*

**OUTLINE:****1 : Geographical Information Systems:**

- Representing Geography: Information technologies in geography
- Geographic information systems: a generic definition, Importance of GIS in Urban analysis, Its other contributing discipline, Major areas of application
- The appeal and potential of GIS, Components of GIS, Benefits of computerising information and collating information in a single platform.

**2 : History and Development of GIS:**

- Maps and their historical development, Advantages of GIS over manual methods, First automatic processing of geographical information
- Important milestones in the development of GIS, Recent developments.

**3 : GIS Roots in Cartography:**

- Spatial learning and development, Using and learning maps, GIS and spatial cognition, Defining a map, Types, Other representation of the world, GIS and computer cartography, Mapping concepts, features and properties.
- Types of information in a digital map, The shape of the earth, Datum types, General coordinate systems, Earth coordinate geometry, Map projections, World geographic reference system (GEOREF), Concept of grid on earth surface and its required correction.

**4: Spatial Data Structure and Models:**

- Information organisation and data structure, Geographic data and geographic information, The relationship perspective of information organization, The operating system perspective-the software, Data-Fundamental concepts, Spatial – non spatial data, database management system, data models, data modeling - theoretical concept with hands-on training.

**5: The Nature and Source of Geographic Data :**

- Spatial data formats – raster and vector data capture, Data collection workflow, Primary & secondary geographic data capture, Obtaining data from external sources, Geographic data formats, Capturing attribute data, Managing a data capture project, Data editing, Data conversion, Geographic data – linkages and matching.

**6: GIS and the Real World Model:**

- Geographical representation of objects, Object attributes, Object relations, From database to GIS to map.
- Role of maps in data modeling, Extension of the reality concept.
- Introduction to Google earth and its connection with GIS.

**7: Selection of a GIS:**

- The evolution of GIS software, The early GIS software programs, Operating systems and GIS, GIS functional capabilities - Data capture, Data storage, Data management, Data retrieval, Data analysis, Data display. Data structures and GIS software, The leading GIS softwares.

**8: Basic Data Models in GIS:**

- Vector data model, Storing points and lines, Storing area boundaries, The Topological approach, Storing vector data.
- Raster data models-realising the raster model, Storing raster data structures,
- Automatic conversion between vector and raster models, Vector versus raster models.
- Attribute data and computer registers, Coding and entering attribute data Storing attribute data, Linking digital map and register information.

**9: Hands-on training on a specific GIS software (Preferably open source)**

**References:**

- 1) <https://sites.duke.edu/envgis/tutorials/introduction-to-google-earth/>
- 2) Anita Graser , "Learning QGIS" PAKT open source, 2016.
- 3) GISP Dr. John Van Hoesen, Dr. Luigi Pirelli, GISP Dr. Richard Smith Jr., GISP Kurt Menke, " A refreshing look at QGIS: Mastering QGIS", PACKT Pub., 2016
- 4) Displaying and analysing 3D data



<b>Code</b>	<b>20UDE16C</b>
<b>Subject</b>	Introduction to Spatial Analysis Software <b>(Professional multidisciplinary subject)</b>
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Viva Marks</b>	-
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

Spatial analysis is key to the successful application of GIS to today's difficult and critical environmental and social challenges.

Usage of Digital mapping technologies such as Google Maps, Google Earth and Microsoft's Bing Maps are now in widespread general use, Full potential of GIS with the engagement of the power of spatial analysis. The course aims to provide students with the knowledge and skills necessary to investigate the spatial patterns which result from social and physical processes operating on or near the Earth's surface.

**Lecture and hands on lab exercises:** Students will complete lab exercises using any good Spatial information systems software such as QGIS/ Global mapper/ Autocad MAP3D/ ArcExplorer with any DBMS

**OUTLINE:**

## 1. Importance of Spatial data:

- Location data is everywhere, understanding its importance and usage of such data set.
- Spatial Data Model, Spatial Data Formats, Spatial Data types, Map Projections and Coordinate Reference Systems

## 2. Concepts and tools in spatial analysis:

- Introduction to Plugis in software for extended functionality, Understanding the Context and Relevance of Spatial Analysis, Engaging in Exploratory Data Analysis, Visualization, and Hypothesis Testing, Understanding Spatial Statistical Relationships
- Outline of the geographic concepts of distance, adjacency, interaction and neighborhood, fundamental in performing spatial analysis.
- Essential theoretical concepts of quantitative geography are examined, including measures of geographical distribution (including point and areal pattern analysis) and spatial autocorrelation, interpolation and network connectivity.

3. Understanding the theories:

- Theoretical understanding and context of spatial analysis so that students are equipped to find and apply the best analytical tools available. This will also help them to identify the problem, to correctly/ appropriately interpret and to present the results.

4. Project design:

- To Plan, to Design and to implement a spatial analysis project. This will demonstrate the ability to select, apply and critically interpret appropriate methods for the analysis of geographical information.

5. Spatial-network analysis:

- linear feature concepts of length, direction and connection are represented and analyzed in networks.

6. Map projections and coordinate reference systems:

- Learning about different coordinate systems and how to apply appropriate spatial references (datum and projection) to spatial data before undertaking analysis.

7. Other techniques for spatial data analysis:

- Outline the central role that spatial autocorrelation plays in spatial analysis and explain how it helps and hinders the use of current tools.
- Demonstrate how different concepts about nearness and neighborhoods result in a variety of interpolation methods that produce different results.
- Outline various ways that overlay is implemented in GIS.

8. 3 Dimensional analysis:

- List several emerging geographical analysis techniques using temporal and 3D analysis. Depth map for space syntax analysis

**References**

1. [Tonny J. Oyana](#), [Florence Margai](#), Spatial Analysis: Statistics, Visualization, and Computational Methods.
2. O'Sullivan, D, and DJ Unwin, 2010. Geographic Information Analysis, 2nd Edition. John Wiley & Sons.

**Semester II**

<b>Code</b>	<b>20UDC21</b>
<b>Subject</b>	Urban Design Studio-II
<b>Periods/Week</b>	10(L/P)+12(SDA)*
<b>Viva Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	12

*(\*SDA Hours for 20UDC21 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated)*

**Goal and Objectives:**

The overall goal of this studio shall be to incorporate and test ideas inculcated in the parallel streams of theories and principles. Objectives shall be; 1. To identify and categorize various non formal issues which are relevant in the process of designing an urban environment 2. To understand the process of making a physical planning proposal viable with available techniques of financing and feasibility 3. To understand the role of various interest groups in the realization of urban design scheme.

**Outline:**

1. The studio shall begin with documenting implemented urban design as a case in understanding the process followed in each of schemes. Documentation shall be an intensive exercise with teams of two who will identify the project (across India) and illustrate the entire process of design as well review the present status of the project and realization of stated objectives.
2. The main studio project shall be chosen within an area of a city (or even a small city) which is undergoing rapid changes triggered by an identifiable event or policy. The studio shall debate the needs of conserving the overall character of the chosen area with an in depth analysis on the social- cultural issues. Design of the proposed built element shall be preceded by a comprehensive urban design scheme which shall be detailed.
3. Projects like; Tourism development; Conservation of Natural and Built Heritage; intervention in an urban area which has not been able to maintain its cultural moorings due to market forces shall be attempted.

**Outcome:** Students should be able to demonstrate

- To comprehend their, understand on city or part of city(development schemes) through analysis,, synthesize the complexity of socio cultural issues of urban environment.
- Apply Urban design tool to analyze, identify issues and design solution at different context such as heritage, tourism etc.

<b>Code</b>	<b>20UDC 22</b>
<b>Subject</b>	Urban Conservation
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credit</b>	3

**Objective:**

The course is intended to introduce and to understand the various issues of urban conservation in terms of feasibility, community participation and heritage charters across the country.

**Outline:**

1. Introduction to conservation of historic and inner city areas. Concepts of conservation in India and Understanding INTEGRATED HERITAGE MANAGEMENT for historic cities.
2. Socio-Economic development, Tourism Infrastructure Development, and role of Urban Design in Understanding of CULTURAL LANDSCAPES, SACRED CITIES.
3. Institutional aspects of Conservation- Charters, World heritage legislation and sites, Conservation Acts and legislation and available institutional frame work of conservation in India- New schemes of Government like HRIDAY for heritage cities, SMART CITIES.
4. Conservation area practice, Adaptive Reuse, up gradation programs in old areas, infill design and regeneration of inner city areas.
5. Conservation management, Community Participation, Economic Regeneration, Financing and Implementation of frame work for Redevelopment and Revitalization projects.
6. Case studies in India and abroad to illustrate the above mentioned concepts and approaches-Introduction to World Heritage Sites and Site Management Plans

**Outcome:** student should able to demonstrate

- Identify/Understand and demonstrate the policies/charters that influence urban fabric
- Understand the conservation and related aspects though national and international projects at various scale.

**References:**

1. Feildan Bernard, Conservation of Historic Buildings, Butterworth-Heinemann.
2. Fitch James, Historic Preservation- A Curatorial Approach, University Press of Virginia.

<b>Code</b>	<b>20UDS 23</b>
<b>Subject</b>	Urban Design Policy and Implementation
<b>Periods/Week</b>	3 (L/SDA)
<b>Exam Marks</b>	---
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

This course will emphasize the importance of integrating the urban design agenda into the city planning process. It will focus on impacts of development controls on urban form and space and illustrate methods and tools to address and incorporate urban design in city planning, from the policy level to plan implementation. Cases and examples of design policy and implementation mechanisms from India and abroad will be used.

**Outline:**

1. Role of urban design in city planning; historic overview and case examples of policy; visioning process; urban design plans, policies and developmental strategies.
2. Case studies of impact of development controls and zoning; analysis of urban design issues; current innovations in development regulations; alternative types of zoning.
3. Implementation of urban design plans, policies and concepts - tools and methods; local-level plans; design guidelines; design review and concept of design review boards.
4. Role of Government, private parties and other stakeholders; participatory design.

**Outcome:** Students should be able to demonstrate in

- Importance of integrating urban design in urban planning process through example
- Development control/ zoning and its implementation and influence of built and un built through different scale.

**References:**

1. Bureau of Indian Standards. *National Building Code*, 2010.
2. Master Plans of Bangalore, New Delhi, Mumbai and other metropolitan Indian cities.
3. Jacob, Alan. *Making City Planning Work*, American Planning Association, 1980. ISBN: 978-0918286123

4. Barnett, Jonathan. *Introduction to Urban Design*, Icon (Harpe); 1st edition, 1982. ISBN: 978-0064303767.
5. Barnett, Jonathan. *Urban Design as Public Policy*, McGraw-Hill Inc.,US, 1974. ISBN: 978-0070037663.
6. Commission for Architecture and the Built Environment. *Design Review, Principles and Practice*, 2009. [www.cabe.org.uk/files/design-review-principles-and-practice.pdf](http://www.cabe.org.uk/files/design-review-principles-and-practice.pdf).
7. Hall, Tony. *Turning a Town Around: A Proactive Approach to Urban Design*. Oxford, United Kingdom: Blackwell Publishing, 2008. ISBN: 978-1405170239.
8. Steve Tiesdell, David Adams. *Urban Design in the Real Estate Development Process*. Wiley-Blackwell, 2011. ISBN: 978-1405192194
9. Lang, Jon. *Urban Design: A Typology of Procedures and Products*. Oxford, United Kingdom: Architectural Press, 2005. ISBN: 978-0750666282.
10. Gerald E. Frug. *City Making: Building Communities without Building Walls*. Princeton University Press, 1999. ISBN: 978-0691007410.

<b>Code</b>	<b>20 UDS 24</b>
<b>Subject</b>	Research Methodology
<b>Periods/Week</b>	3 (Lecture)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objective:**

The course is an introduction to the design of research projects. The course follows the scientific and quasi scientific approach to research design within the social sciences frame work. Importance of Research as related to Urban Studies focusing on Urban Design, Planning, to Architecture, Design and buildings.

**Outline:**

1. Science and common sense. Four methods of knowing, science and its functions. Scientific explanation and theory, scientific research- a definition. Ethics in conducting Research, Problems and Hypotheses, Generality and specificity of problems and hypotheses. Examples with respect to Urban design, Planning Architecture and buildings shall be the Focus.
2. Conceptual foundations of research design, purpose of research design, research design as variance control. Research question design, Concepts, constructs and variables. Types of variables. Interrelationship of variables- Qualitative, quantitative, mixed methods-definition, types and application in Urban Studies.
3. Survey Research: Types of surveys, methodology of survey research. Questionnaire Design. Definitions of reliability, theory of reliability. Types of validity. Variance definitions of validity. Interview schedule, Different types of interview methods. Examples of interview as a research tool. Sampling, random sampling and representativeness. Randomization, sample size and kinds of samples. Preparation of and types of Questionnaires. Administering questionnaires, target group, Methods of gathering information.
4. Case study research methods- single case, multiple case, comparative case study research etc.
5. Definition and purpose of statistics. Data sources, collection methods, and representation techniques. The law of average numbers Standard deviation, interpretation of data Mean, differences, correlation coefficients. Correlation, Variance, Co Variance, Mathematical Sums for Practice. Hypothesis testing.
6. Examples of Research Papers, formation of Abstract, Reading of Papers.

**Outcome:** students should be able to proficient in

- Technical aspects of research methodology and its application in to urban design study/observation at different scale and complexity.

**References:**

1. Ranjit Kumar, Research Methodology- A step by step guide for Beginners. Sage Publications, New Delhi.
2. Fred N. Kerlinger, Foundations of Behavioural Research, Holt, Rinehart and Winston Inc, New York.
3. *Enquiry by Design: Tools for Environment-Behaviour Research.* John Zeisel. Publisher-CUP Archive, 1984. ISBN-0521319714, 9780521319713



<b>Code</b>	<b>20UDS 25</b>
<b>Subject</b>	Ecology and Site Planning
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objective:**

To introduce students to the art of site planning and the concerns of environmental variables in the process of urban design.

**Outline:**

1. Introduction to site analysis with emphasis on study of natural and manmade features of the site.
2. Site Planning: Site, User, Programme and Design. Sensed landscape and its materials, access, earth work and utilities. Field surveys, reading aerial survey, climatic variables. Site Planning strategies and case studies.
3. Landscape design concepts and design of open and public spaces, recreation areas, road side landscapes.
4. Ecology: Basic concepts of ecology, components of environmental planning, use and management of resources; environmental concerns related to development; environmental degradation; pollution control and evaluation of energy resources.
5. Introduction to environmental planning concepts, spatial environmental planning. Eco-system and components of ecosystem structure; principles of ecology; physical science; earth science; man-environment interface towards sustainable development.
6. Sustainable urbanity and urban climate change: ECO URBANITY- Towards well-directed urbanity.
7. Urban landscapes and Sustainable cities: Urban Biodiversity and ecology.
8. Ecology and settlements,, changing Role, of Terrain, water and vegetation.

**Outcome:** Students should be able to demonstrate

- To understand the site planning

- To understand the concern of ecological aspects that influence urban design in different scale of city.

**References:**

1. Kevin Lynch, Good City Form, MIT Press, Cambridge
2. Kevin Lynch and Gary Hack, Site Planning, MIT Press, Cambridge.
3. Peter Jacobs and Douglas Way, Visual Analysis of Landscape Development, Harvard Press.
4. Gary.O.Robinette (Ed), Landscape Planning and Energy Conservation. Van-  
Nostrand Reinhold.
5. Design with Nature: Ian L. McHarg.
6. The Landscape of Man: Geoffrey Jellicoe an Susan Jellicoe.
7. *Geography of Settlements*. Author: *R.Y. Singh*. ISBN,

<b>Code</b>	<b>20UDE 26A (Core Elective)</b>
<b>Subject</b>	Public Participation in Governance
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Exam Marks</b>	---
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

The course is intended to introduce concept of people's participation in urban design project

**Outline:**

1. Concept and importance of people's participation/planning, types and relevance, existing system and scope.
2. Identification of stake holders, issues and interactions, institutionalization of people participation.
3. Individual/NGO/CBO efforts in peoples planning with example, national and international.
4. Role of urban designer in process of people participation in urban design project, example.

**Outcome:** Students should be proficient in

- Understanding the different concepts of peoples planning.
- Identify clearly process that involve in peoples participation though urban designer lenses.

**Reference:**

1. Report-seminar on good urban governance new Delhi 2001-2002, Nagarapalika journal, reports etc.

<b>Code</b>	<b>20UDE 26B (Professional Elective)</b>
<b>Subject</b>	Sustainable Urban Design Practices
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Exam Marks</b>	-
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

The urban practices which address the concern of sustainable aspects of planning and managing urban area.

**Outline:**

1. Theory, comprehensive framework, ethics and approaches that involves from past to current Urban practices.
2. Critical Study of an urban practice its impact on various aspects of such as ecology, built, social and cultural, community etc.
3. Study of an Indian or western Examples which is based on new sustainable approaches/practices that bring in new relation and positive outcome in experiencing urban environment.

**Outcome:** Students should be proficient in

- Understanding the different theory and approaches of sustainability urban practices.
- identify urban practices that is sustainable and address the qualitative aspects as outcome

**References:**

1. Rethinking sustainable cities: multi-level governance and the urban politics of climate change. *Environmental politics* Bulkeley, H. and Betsill, M. 2005.
2. The city: suggestions for the investigation of human behavior in the city environment. Park, R.E. 1915.
3. Sustainable urban design: principles to practice-Matthew Carmona

<b>Code</b>	<b>20UDE26C(Professional multidisciplinary subject)</b>
<b>Subject</b>	Urban Management
<b>Periods/Week</b>	3 (L/P/SDA)
<b>Exam Marks</b>	----
<b>Progressive Marks</b>	100
<b>Total Marks</b>	100
<b>Credits</b>	2

**Objective:**

The course intended students to develop skills to understand and illustrate the complex problems that involve in function and bring efficiency in managing the Urban Environment.

**Outline:**

The course will introduce theoretical understanding with case studies and encourage students to hands on experience under the following urban systems

1. Human resource management: The systems that involve fundamentals and effective management of Human resources in urban area including HR policies and Laws
2. Natural resource management system: different natural resource, stake holders and management which connects to the development.
3. Urban finance management system: Understand fundamentals of urban finance, Effective and efficient budget in ULBs, financial planning and management
4. Urban project management system: Management aspects of urban finance and project management of small and large scale urban projects.

Students exercise could prepare a management plan for the small or large urban area and which could address above said management systems.

**Outcome:** students should be proficient in

1. Understand and illustrate the complex issues involve in functioning of urban area.
2. Able come up with broader idea of management plan for a given urban area.

**References:**

1. Ahluwalia, I. J. (2014a). Improving our cities through better governance. London, England: LSE Cities
2. Ahluwalia, I. J., Kanbur, R., & Mohanty, P. K. (2014). Urbanisation in India: Challenges, opportunities and the way forward. New Delhi, India: Sage India
3. World Bank. (2012). Lessons from business plans for Maharashtra, Rajasthan, Haryana and international good practices. Washington, DC: Author.
4. Brosius, J.; Peter Tsing; Anna Lowenhaupt; Zerner, Charles (1998). "Representing communities: Histories and politics of community-based natural resource management". *Society & Natural Resources*.

**Semester III**

<b>Code</b>	<b>20 UDC31</b>
<b>Subject</b>	Urban Design Studio-III
<b>Periods/Week</b>	14(L/P)+6(SDA)*
<b>Viva Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	11

(\*SDA Hours for 20UDC31 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated)

**Goal and Objectives:**

- 1) The primary goal of the studio shall be to look at “urban design proposal” as a catalytic force in ensuring future growth with “design” content, yet feasible within the existing policy, economic and political frame work.
- 2) The objectives of the studio are; a) To understand and evolve policy level guidelines which ensure an imagined future physical scenario, b) To understand the process of evolving urban design guidelines c) To illustrate such guidelines with a multiuse facility

**Outline:**

1. The chosen project shall be in an area of high potential in an identified urban environment. Project proposals shall be divided into two phases in which a policy and guideline evolution shall precede the actual design project. The project would involve a) identification of various stake holders and their role in policy level guidelines, and b) working and illustrating the economic feasibility and infrastructure development needed for implementation of proposal.
2. The project shall end in a detailed design of a group of buildings or (depending on the scale) an architectural project which illustrates the process of urban design as a necessary and inevitable need for architectural projects.

**Outcome:** Students should be able to demonstrate

- Ability to study urban environment and its influence by policy and its ability to make positive effect on urban environment
- Ability to demonstrate design skill and detail at built/space level.

**Reference:-**

- 1) Sendich, Emina, Planning and Urban Design Standards, American Planning Association, John Wiley and Sons Inc, New Jersey, 2006.

<b>Code</b>	<b>20 UDC 32</b>
Subject	Dissertation Seminar
Periods/Week	4 (L/P/SDA)
Exam Marks	---
Progressive Marks	100
Total Marks	100
Credits	3

**Objective:**

A studio class where third semester students undertake various reading and writing exercises in the process of identifying and refining their dissertation topics.

**Outline:**

1. This course is intended to help students to arrive at a conceptual framework for their dissertation in the IV semester.
2. The final product at the end of course shall be a proposal that provides a detailed dissertation proposal that consists of a working title, literature review, objectives, and study methodology.
3. The course will be run as a weekly four-hour seminar class with student presentations on issues related to their chosen dissertation topics.

**Outcome:** Students should be

- able to theorize the urban design issues at different scale
- Able to understand the urban design project from beginning to end as comprehensive process as involving multi professional.

<b>Code</b>	<b>20 UDC33</b>
<b>Subject</b>	Contemporary Theories of Urbanism and Architecture
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objective:**

To expose the students to the current theoretical trends in architecture and urbanism, with focus on Western architecture but with cross reference to Contemporary Indian trends using relevant examples.

**Outline:**

1. Post Modernism and post functionalism. Post script to the modern movement. Semiotics and structuralism. Post structuralism and Deconstruction. (Eg. Works of Robert Venturi, Robert Stern, Charles Moore, Peter Eisenman, Bernard Tschumi, Zaha Hadid, Daniel Libeskind and similar architects with examples.)
2. Urban theory after Modernism, Contextualism, Main street and beyond. Collage city and towards the contemporary city.
3. School of Venice, territory and architecture, an analogical architecture. Political and ethical agenda, the ethical function of architecture. (Vittorio Gregotti, Aldo Rossi)
4. Heidegger's thinking on architecture, a look at the phenomenology of architecture, Phenomenology and meaning of place. (Christian Norberg-Schulz, Juhani Pallasmaa, Spirit of Place and Indian temple towns and vernacular architecture )
5. Critical regionalism, local culture and universal civilization. Tectonic expression. Brief review of the issues of Gender in architecture.
6. City design examples such as Lutyens Delhi, Chandigarh, Bhubaneswar, Shantiniketan and Relevance of Postmodern theory in India

**Outcome:** Students should be proficient in

- Critically understand the theories involve in urbanism and architecture.
- Critically understand and able to take position on different theoretician and their theories.



**Reference:**

1. Kate Nesbit, Theorizing a new agenda for architecture, Princeton Architectural Press, 1996.
2. Michael Hayes, Architecture Theory since 1968, MIT Press, London.
3. Kevin Lynch, Good City Form, MIT Press, London.
4. Bernd Evers, Architectural Theory From Renaissance to the Present, Taschen, Cologne, 2002.
5. Geoffrey Broadbent, Emerging Concepts in Urban Space Design, Taylor & Francis, 1995
6. Jon Lang, Concise History of Modern Architecture in India, Permanent Black, 2010
7. Dr. Solomon Benjamin, Urban Informality
8. Shilpa Ranade, Gender and Space

<b>Code</b>	<b>20 UDS34</b>
Subject	Infrastructure and Transportation Planning
Periods/Week	4 (L/P/SDA)
Exam Marks	60
Progressive Marks	40
Total Marks	100
Credits	3

**Objective:**

The course is intended as an introduction to the infrastructure needs of an urban environment and fundamental concepts which cater to such needs. It is also intended as an introduction to the issues related to Traffic and Transportation in cities. In addition, it is intended to provide an overview of the Transportation Planning process.

1. Urban Form - Elements of urban form-Growth of Urbanization- Impacts – Urban Design-Transportation and Urban form-Functional Classification of Urban Roads.
2. Urban Infrastructures and city – Concepts, Physical and Social Infrastructure, History of infrastructure, Layout of urban area, siting of services and land use and efficiency. Basics of service network. - Water supply, sewerage/drainage and waste management.
3. Urban Social infrastructure; Qualitative and Quantitative techniques of assessing requirements, planning amenities.
4. Smart Cities – Concepts- Goals- Proposals for Indian Cities.-Safe access and Street Design in Indian Cities
5. Urban Transportation Characteristics- Factors for need of Transportation – Demand- Modes- Urban Transport Scenario in India- Components of urban Transport System-Introduction to general Traffic Engineering.
6. Introduction: Scope of urban transport planning, interdependency of land use and traffic system, system approach to urban transportation Planning- Stages in Transport Planning, Climate change, Transit oriented development.
7. Transport Demand Modeling – Introduction- Transportation surveys- Definition of study area, zoning, types of surveys.
8. Four Step Modeling (FSM)- Trip generation- Trip production- Trip distribution- modal split and Trip assignment.

9. Public Transportation modes: Systems in India, problems and prospects, present practices in urban transportation. Metro, mono, and high capacity buses. System selection.

**Outcome:** students should be able to proficient in

- Understanding the fundamental concept/prospects of infrastructure, transportation/planning and its practice in India.

**References:**

1. Hamada M., Critical Urban Infrastructure Handbook © 2015 by Taylor & Francis Group, CRC Press New York
2. Papacostas and Prevendours, Transportation Engineering and Planning, PHI Publication, 2013
3. Kadiyali L.R. Traffic Engineering and Transportation Planning, Khanna Publications.
4. S. Ponnuswamy, Johnson Victor., Urban Transportation: Planning, Operation and Management, Tata McGraw Hill- New Delhi 2014
5. Safe access manual: safe access to mass transit stations in Indian cities, Bangalore: EMBARQ India.-shah, sonal, sahana goswami, lubaina rangawala, Robin King, Himadri Das, Akhila Suri (2014)
6. ITDP and EPC(2011): Better Streets Better Cities : A Guide to Street Design in Urban India. Institute for Transport and Development Policy
7. Peter Calthorpe.(2011). *Urbanism in the Age of Climate Change*. Island Press. Washington DC
8. Hank Dittmar, Gloria Ohland.(2004). *The New Transit town: Best practices in Transit Oriented Development*. Island Press. Washington DC
9. Stephen Graham, S M (2001). *Splintering Urbanism, Networked Infrastructure, Technological Mobilities and the urban condition*. London. Routledge
10. Related reading materials

<b>Code</b>	<b>20 UDS 35</b>
<b>Subject</b>	Urban Governance and Project Finance
<b>Periods/Week</b>	4 (L/P/SDA)
<b>Exam Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	3

**Objective:**

Introduction to the mechanism of urban governance and fiscal foundations of urban development.

**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 man power. 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 proficient in

- Concepts of urban governance, overlapping of territory, various stakeholder and their role in the city
- Infrastructure and finance aspects of local administration.

**References:**

1. Maria Pinto, Metropolitan City Governance in India, Sage Publications, New Delhi.

2. John Abbott, Sharing the City: Community participation in urban Management, Routledge, Abingdon, 1996.
3. Jain R.B. Public Administration in India, 21<sup>st</sup> Century challenges for Good Governance. Deep and Deep Publications Pvt. Ltd, New Delhi.
4. Michael Bambarger and Eleanor Hewitt, Monitoring and Evaluating Urban development Programmes: A hand book for program managers. The World Bank, 1988

<b>Code</b>	<b>20 UDE 36A (Core Elective)</b>
Subject	Urban Housing
Periods/Week	3 (L/P/SDA)
Exam Marks	---
Progressive Marks	100
Total Marks	100
Credits	2

**Objective:**

The course is an introduction to the policies, market, finance and delivery of housing to various segments of urban population. Basically, however it shall be an exercise in the design of a large scale housing project either as a Greenfield project or an intervention into an existing fabric of the city.

**Outline:**

1. Evolution of housing policies in India, introduction to housing need; demand and supply process; estimation of housing need and demand; review of housing policies in various planning periods in India; Basic concepts in understanding housing markets; market price and valuation; policies which affect the housing market; review of existing housing finance and institution of housing finance. Concepts of housing layouts; issues of density, open spaces, community spaces and accessible open areas. House types and their implication on layout. Technology and delivery of housing; private and public role in housing market. Low income and marginal income housing schemes and institutions involved in the production. Design guidelines for marginal housing schemes for varied socio economic groups.

**Outcome:** students should be proficient in

- Evolution of housing policies in india and critically review the existing policy/framework that influence on housing including housing finance, market price and valuation.
- Understand the concepts of housing and its access by different socio economic groups.

**References:**

1. Kavita Datta and G.A.Jones Housing Finance in developing countries, Routledge, London.
2. Cedric Pugh Housing and Urbanization, Sage Publications, New Delhi.

<b>Code</b>	<b>20 UDE 36B (Professional Elective)</b>
Subject	GIS-II
Periods/Week	3(L/P/SDA)
Exam Marks	---
Progressive Marks	100
Total Marks	100
Credits	2

**Objective:**

The course is intended to understand GIS as a decision-support tool in urban spatial planning process. **Pre-requisite to this course is GIS-I in previous semester.** In GIS-II along with some basics and understanding of advanced GIS concepts, advance GIS models, techniques and real world applications in spatial planning. The course also introduces to Geographic Query and Analysis, Application in a Urban project and glimpse of future of GIS.

It also establishes a bridge between the conceptual realms - Architecture /Site - Terrain Analysis/ Landscape architecture/Urban Design and Urban planning. Output being digital, online and printed maps.

**Lecture and hands on lab exercises:** Students will complete lab exercises using any good Spatial information systems software such as QGIS/ Global mapper/ Autocad MAP3D/ ArcExplorer wit any DBMS

**OUTLINE:****1: Advanced Data Models:**

- Surface representation, Grid model, Other models
- Practical observations – Accuracy, 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

**2: 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.

**4: The Future of GIS:**

- Future data: Easy access to digital data, Remote sensing and GIS, GPS as data source for GIS. Image maps and GIS, Data exchange and GIS.
- Location - based services and GIS.
- Future hardware – The workstation revolution, The network revolution, The microcomputer revolution, The mobility revolution, The impact of the revolutions,
- Future prospects of hardware, Future software – Software trends, The user interface and WIMPs, The raster versus vector debate, object - oriented GIS, Distributed databases, GIS user needs, GIS software research.
- GIS interoperability, Future issues and problems – Privacy, Data ownership, Scientific visualization, New focus.

**5: 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

**6: Urban Project:**

- Application of GIS through an URBAN Project taken from previous semester.

**References:**

- 1) <https://sites.duke.edu/envgis/tutorials/introduction-to-google-earth/>
- 2) Anita Graser , "Learning QGIS" PAKT open source, 2016.
- 3) GISP Dr. John Van Hoesen, Dr. Luigi Pirelli, GISP Dr. Richard Smith Jr., GISP Kurt Menke, " A refreshing look at QGIS: Mastering QGIS", PACKT Pub., 2016.
- 4) Displaying and analysing 3D data



<b>Code</b>	<b>20 UDE 36C</b>
<b>Subject</b>	<b>Data Analytics(Professional multidisciplinary subject)</b>
<b>Periods/Week</b>	<b>3(L/P/SDA)</b>
<b>Exam Marks</b>	<b>---</b>
<b>Progressive Marks</b>	<b>100</b>
<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>2</b>

**Objective:**

Urban analytics: is the practice of using new forms of data in combination with computational approaches to gain insight into urban processes looking to data to find better ways to manage cities and urban areas around the world. Gain insight into methods and techniques employed in analysing contemporary planning issues, policy outcomes and impacts. understanding of the nexus between urban life and digital technology.

This elective course provides the knowledge and skills to design and conduct appropriate analyses, and experience of working with cutting-edge datasets.

**lecture and hands on lab exercises:** Students will complete lab exercises using any good Spatial information systems software such as QGIS/ Global mapper/ Autocad MAP3D/ ArcExplorer/coding in python or R software/ GRASS.

**OUTLINE:**

1. Urban systems and management:
  - Understanding urban systems and supporting urban planning and management.
  - Introduction to basic terms and concepts, the roles of different types of cities in urban networks.
  - Practical and analytical skills to explore, visualise, and to understand city-scale spatial data. Data Analytics as a key component in architecture and Urban research domain
2. Interdisciplinary methodological skills:
  - Concepts and terms in data analytics, Introduction to Big data, different forms which big data take to design solutions to the world's urban challenges – capitalising on emerging developments in data analytics and digital technologies.
3. Principles and application of GIS software:
  - Use of spatial methods and geographic information systems (GIS). Its fundamental theories and methods. Application of GIS in practice to real world problems using appropriate GIS software. (preferably open source)

4. Programming tools for urban analytics:
  - Different analytical tools, Analysis of trends and spatial patterns with indicators, Baseline profiling and making use of neighbourhood statistics.
  - Monitoring of change: time series and spatial movement.
  - Model of communication; Visualisations as data and maps,
5. Quantitative data analysis:
  - Introduction to basic statistics and data analysis. Understanding Quantitative and qualitative analysis techniques; univariate to multivariate linear regression. taking a data set example-Summarise, analyse and present data in a valid way.
6. Processing quantitative data:
  - Data analysis with Excel, DBMS and GIS (This includes vector operations like buffering, clipping and intersection, as well as raster-based manipulations such as applying map algebra, or calculating slope and exposition from digital elevation models)
  - Different approaches, such as land-use transport interaction models, cellular automata, agent-based modelling, etc., These models will be considered at different time scales, such as short-term modelling, e.g. diurnal patterns in cities, and long term models for exploring change through strategic planning.
7. Sustainable urban features:
  - Understanding Urban features, Area typologies and its classifications, Projections and scenario building.
  - Sustainable urban futures, knowledge of interdisciplinary urban analytical methods.
8. Urban Policies and evaluation:
  - Policy development and strategic plan-making, present results for policy audiences.
  - Techniques and methods used to analyse and evaluate spatial issues and planning policy.
9. Urban analytics project:
  - Application of Data Analytics through an URBAN Project taken from previous semester. Development of a urban project using concepts learnt in this course.

**References:**

1. Batty, M. (2013). The new Science of Cities. The MIT Press.
2. Jensen, R. R., Gatrell, J. D., & McLean, D. (Eds.). (2007). Geo-Spatial Technologies in Urban Environments: Policy, Practice, and Pixels. Springer.

3. Agent-Based Modelling and Geographical Information Systems, A Practical Primer, Andrew Crooks - George Mason University, USA
4. Townsend, A. (2015). Cities of Data: Examining the New Urban Science. *Public Culture*, 27(2 (76)), 201–212.
5. Burrough, P. A., McDonnell, R. A., & Lloyd, C. D. (2015). *Principles of Geographical Information Systems* (3rd Ed.). Oxford University Press.
6. Chun, Y., & Griffith, D. A. (2013). *Spatial statistics and geostatistics: theory and applications for geographic information science and technology*. Sage.
7. Dovey, K., Pafka, E., & Ristic, M. (Eds.) (2018). *Mapping Urbanities*. Taylor & Francis.
8. Fischer, M. M., & Getis, A. (Eds.). (2010). *Handbook of Applied Spatial Analysis*. Springer.
9. Gaetan, C., & Guyon, X. (2010). *Spatial statistics and modeling* (Vol. 81). New York: Springer.
10. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic Information Science and Systems* (4th Ed.). Wiley.
12. Spector, Paul E., and Michael T. Brannick. "Methodological Urban Legends: The Misuse of Statistical Control Variables." *Organizational Research Methods*, 2011. <https://doi.org/10.1177/1094428110369842>.
13. Morgan, David L. "Research Design and Research Methods." In *Integrating Qualitative and Quantitative Methods: A Pragmatic Approach*, 2017. <https://doi.org/10.4135/9781544304533.n3>.

<b>Code</b>	<b>20 UDI 37</b>
Subject	Professional Training
Periods/Week	Eight weeks
Viva Marks	100
Progressive Marks	---
Total Marks	100
Credits	3

**Objective:**

To serve as an introduction to the various dimensions of professional practice in an Architectural and Urban Design firm.

**Outline:**

1. The student is expected to work in an architectural and urban design firm handling the following types of projects; a) large scale architectural projects like college/university campus, industrial units, commercial complexes, housing complexes, entertainment complexes etc. involving a number of related buildings, site planning and landscaping, b) architectural projects with focus on heritage conservation in an urban area, c) urban infill projects and d) revitalization projects of decaying parts of the city.
2. 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 and f) design process and presentation. For the viva examination, the following items need to be presented a) statement indicating the various types of works done by the student, b) drawings related to projects with which the student was associated c) photographs of project sites and d) any other material in support of student's involvement in the work.
3. The eight weeks (56 days) should immediately precede the commencement of regular course work of third semester.

**Semester IV**

<b>Code</b>	<b>20 UDC41</b>
<b>Subject</b>	Dissertation
<b>Periods/Week</b>	23 (L/P)+15(SDA)*
<b>Viva Marks</b>	60
<b>Progressive Marks</b>	40
<b>Total Marks</b>	100
<b>Credits</b>	20

**Objective:**

*(\*SDA Hours for 20UDC41 are dedicated for the students to carry out site visits, library reading, etc. Hence they are not calculated under contact hours but credits are allocated)*

**Outcome:** Students should be proficient in

- Process that involves in urban design professional practice.
- 1. To demonstrate the ability to comprehend the nature of urban design problem and create a brief which sets the framework for design.
- 2. To demonstrate an advanced level of design ability to convert the brief set forth into a speculative proposition of design.
- 3. To articulate and delineate the proposition of design into an urban design solution addressing all the dimensions.
- 4. Alternatively, the dissertation could be a research topic based on the accepted norms of scientific research methods

**Outline:**

1. The dissertation can either be a scholarly research on an issue (or set of issues) which has a bearing on urban development or a project with a clearly demonstrated design development process. The project shall demonstrate competence in integrating various issues of social, formal and urbanistic concerns into the design. An ideal project shall be one in which there is an informed critique on the conventional or prevalent models of creating urban design, leading to a simple question and an answer which shall be through the demonstration of an alternative proposition.
2. In the case of purely written dissertation which ends with policy or design guidelines, research design shall be as per the accepted norms of scientific

research methods. Documentation or merely describing existing situation shall not be considered as dissertation.

**Outcome:** Students should demonstrate his/her

- Understanding and comprehend the urban environment and define the urban design issues
- Demonstrate the study/research methodology that involves defining urban design tools and proposed design aspects.
- Able to demonstrate urban design project at different scale

<b>Code</b>	<b>20 UDE42A (Core Elective)</b>
Subject	Politics of Development
Periods/Week	3 (L/P/SDA)
Viva Marks	---
Progressive Marks	100
Total Marks	100
Credits	2

**Objective:**

To critically discuss the motives and actions of different actors of state and society in driving urban development and distribution of resources in the city.

**Outline:**

The course explores the impact of the intentions, conflicting interests, pressures and policies on the social and morphological dimensions of the city. Various issues pertaining to the role of different actors in shaping urban developmental projects are discussed, using papers and literature on those topics. Topics discussed in this weekly four hour class include public and private developmental project, design commissions, social planning and spatial planning and planning processes in Indian cities.

**Outcome:** Demonstrate the ability

- To critically analyze/understand the complexity of development/projects which involves not only stakeholders but also the conflicting interest?

**References:**

1. Elizabeth Strom and John Mollenkopf (Eds), The Urban Politics Reader, Routledge Taylor & Francis Group, 2004
2. Partha Chatterjee, The Politics of the Governed, New York: Columbia University Press, 2004.
3. Nandan Nilekeni: Imagining India, Penguin Press, 2009.
4. Champakalakshmi R ,Trade Ideology and Urbanisation in India, Oxford University Press, New Delhi, 1999

<b>Code</b>	<b>18UDE42B ((Professional multidisciplinary subject)</b>
Subject	Urban Economics
Periods/Week	3(L/P/SDA)
Viva Marks	-
Progressive Marks	100
Total Marks	100
Credits	2

**Objective:**

To introduce the theoretical framework for understanding the spatial structure of cities and the nature of urban economy.

**Outline:**

1. Introduction to the economics of geographical concentration, urbanization, history of urbanization, agglomeration economics, and simple theory of inter- urban location, location decisions of households
2. Land Use and Location Theory
3. The Contemporary City and Suburbanization/Sprawl
4. The Economics of Zoning
5. Housing, Segregation, Crime, and Poverty
6. Local Government and governance

**Outcome:** proficiency in

- Economy aspects of city and various theory that involve in defining urban situation.

**Reference:**

1. O'Sullivan, Arthur, *Urban Economics* (Fifth Edition). Boston: Irwin/McGraw Hill, 1990, 2003.



