

VISVESVARAYA TECHNOLOGICAL UNIVERSITY BELAGAVI



Syllabus of
M. Plan- SMART CITY PLANNING (SCP)
(Effective from the Academic year 2022-23)

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Registrar

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Semester- I

PLANNING STUDIO-1			
Course Code	22SCP11	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	12 hrs (2:6:4)	Viva Marks	50
Total Hours of Pedagogy	192	Total Marks	100
Credits	8		
<p>Course Learning objectives: By taking this course Students will be able to:</p> <ul style="list-style-type: none"> Plan and design spaces for the needs of people and the function of both rural and urban communities by undertaking a critical study of socioeconomic data in relation to the spatial characteristic analysis. Understand the basis for zoning regulation and building bylaws in various contexts defined for neighbourhood plans and master plans by using norms, guidelines, and innovative approaches. Understand the division of land use and distribution patterns for both rural and urban human settlements. 			
Foundation Studio (2 weeks):			
<ul style="list-style-type: none"> Basic Principles, aims and objectives of Physical planning. Space standards, Normative Standards, Performance Standards Urban Development Plan Formulation and Implementation (UDPFI): Planning norms and standards. Development Control: Zoning Regulations, Sub-division Regulations and Building bye-laws and Regulations for conservation of historical, heritage and natural areas. Neighbourhood planning: <i>Principles and Techniques, Site Analysis.</i> Planning Surveys, <i>socio-economic surveys</i> and studies for preparation of Master Plans. Preparation of Master Plans for Local Planning Area. URDPFI Guidelines for Plan Preparation and Implementation. 			
Teaching-Learning Process	<i>Blended learning:</i> Power point presentation to elaborate on key topics.		
Exercise-1: Topographic sheet analysis (Individual assignment) (2 weeks)			
<ul style="list-style-type: none"> Introduction to maps. Obtaining and analyzing the topographic sheet in respect to the salient features. Presentation of the analysis Individual Assignment Report: Interpretation of Topographical sheets 			
Teaching-Learning Process	<i>Blended learning:</i> Power point presentation to elaborate on key topics. <i>Student Presentations:</i> Individual student presentations.		
Exercise-2: Neighbourhood Appreciation (Group assignment) (4 weeks)			

The neighbourhood appreciation exercise aims to enable the students to understand and contextualize the location of the area to the city, zone, and area in which the particular place is situated. This is done with the socio-economic, spatial, and cultural characteristics of that city, zone, location, etc. The main purpose is to make the students appreciate the locational attributes of land parcels for future development in a city. Due to the size of the area, this exercise is done in groups of students being assigned to a particular area.

The following planning issues at the area level should be identified:

- Review of the Master Plan /Zonal/ Area plan concerning the selected areas.
- Appreciation/Analysis of ward-level data.
- Perception of areas in terms of legal/illegal/authorized/unauthorized, Slums, Urban Aesthetics.
- Social Categorizations of people- Type of population living, people's perception about the area, and its planning problems.
- Land use includes Agriculture land and land-use conflicts, extent (%) of broad land use such as commercial, industrial, residential, institutional, and recreational.
- The extent of formal/informal activities present in the area including their location and conflicts.
- General land tenure of the area and land value for different uses
- Major types of transport, type of roads, the hierarchy of roads, type of transport modes used.
- Amenities: Location of Socioeconomic and Physical infrastructure and their problems as perceived by the local population. Look for specific infrastructure such as Water supply, drainage (water logging areas), waste collection and disposal system, sanitation, education, healthcare and banking facilities, etc.
- Environmental Issues: Open Spaces – Availability and extent of open space to the built-up area, garbage disposal, encroachment (through photographic evidence and sketches)
- Locating the study area in the zone, city, and regional context for all the above aspects.

Teaching-Learning Process	<p>Blended learning: Power point presentation and webinars.</p> <p>Data Collection & Analysis.</p> <p>Student Presentations: Student Group presentations.</p>
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Exercise-3: Master Plan revision for a small/medium town (Group assignment) (8 weeks)

A Town is a multi-dimensional, dynamic, and futuristic space. Understanding the town involves appreciating its several dimensions and including them in the planning process. The job of a physical planner is not merely to understand the existing conflicts in development but to emerge out of this and to come out with a practical vision for the town. To arrive at this vision, a planner needs to understand the dynamics of various components of the town and how and at what level interventions can be made to achieve that vision.

A group of students is expected to study a small to a medium-sized town in terms of its present problems and issues and project a futuristic vision in terms of scenario building.

The exercise shall involve the following:

- Revision of Masterplan for a small/medium-sized town.
- Students in groups shall engage in primary data collection such as primary surveys, land-use map updating/verification, and verification of physical attributes.
- The bulk of the data may be obtained through secondary sources like Govt. websites/ Publications/ offices.

- Visit to the selected town shall focus on meeting various stakeholders/departments to ascertain their respective plans for the proposed plan period.
- Interaction with the local planning authority/ development authority and their consultants to procure any missing data.
- The proposed Master Plan at the time of presentation shall present more than one scenario of development. The study template of Neighbourhood analysis shall form the basis for investigation and proposals.
- Students divided according to selected study templates shall contribute to the preparation and submission of a Revised Master Plan document along with the proposed land use maps (but may exclude Zoning Regulations) for their SEE.

Teaching-Learning Process

Blended learning: Power point presentation and webinars.

Data Collection & Stakeholder Engagement.

Collaborative and Cooperative learning: Students should work as a group and present the compilation of work starting with Introduction, Preparing Master Plan report and Land Use Maps.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Viva voce is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in Viva is 50% 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 Viva- Voce taken together.

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, Special Officer/ Special Officer/ PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for IPCC (Integrated Professional Core Course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.

Viva voce Examination:

1. The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.
2. The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.
3. The viva-voce marks awarded for PSC (Professional supportive course), shall be based on the evaluation of report submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.
4. The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:
Books

1. Nelson Petrie, 2016, *Analysis and Interpretation of Topographical Maps*, The Orient Blackswan, India.
2. *URDPFI guidelines*, 2016, Ministry of Housing and Urban Development.
3. Census of India publications, Govt. of India.
4. *Revised Master Plan 2016*, Bangalore Development Authority, 2006.
5. *Revised Master Plan 2031 draft*, Bangalore Development Authority, 2017.
6. Gallion A B, 2005, *The Urban Pattern: City Planning & Design*, CBS publications, 5th Edition.
7. Ashok Kumar, et. al, 2020, *City planning in India:1947-2017*, Routledge.

8. Marichela Sepe, 2012, *Planning and place in the city: Mapping place identity*, Routledge,

Web links and Video Lectures (e-Resources):

1. Centre for Livable Cities:
<https://www.youtube.com/c/CentreforLiveableCities>
2. Urban Planning Explained:
<https://www.youtube.com/channel/UC6GZxJAucQK7HBFynRG1Msw/videos>

Skill Development Activities Suggested:

- Guest Lecture from domain experts from Industry.
- Case Studies.
- Site Visits to Govt Agencies/Offices for understanding their roles and collecting information pertaining to the studio activities.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Successfully obtain and interpret the topographical maps	L4
CO2	Analyse and interpret the norms and guidelines pertaining to Planning	L4
CO3	Create a detailed analysis of the neighbourhood profile	L5
CO4	Prepare a detailed Master Plan report	L6

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	L	L	L	M	M	L	H	M	H
CO2	H	M	M	M	H	L	L	H	H
CO3	M	H	H	M	H	M	M	H	M
CO4	H	H	H	H	H	H	M	H	M

H – High, M – Medium, L – Low

HISTORY & THEORY OF PLANNING			
Course Code	22SCP12	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	2 hrs (2:0:0)	SEE Marks	50
Total Hours of Pedagogy	32	Total Marks	100
Credits	2	Exam Hours	03
<p>Course Learning objectives: By taking this course Students will be able to:</p> <ul style="list-style-type: none"> • Understand the evolution of human settlements and the philosophies guiding the early and modern Town and Country Planning with case studies • Explain the systems of City planning in pre-& post-industrial periods • Understand the various schools of thought guiding the theories on settlements and urban & regional planning 			
Module 1			
<p>Planning History A brief history of human settlements, from the Stone Age and milestones, in prehistoric to the historic period. Evolution of physical forms as a result of geographical, geological, climatic, social, economic, political, and technological aspects of human settlements. Ancient river valley civilizations (Egyptian, Mesopotamian, Indus valley, and Chinese). Types of plans described in Vedic Scripts (Swastika, Karmukha, Dandaka, Padmaka, etc.) Settlements and their physical forms during various dynasties up to the 18th century and during colonization (Case studies – Jaipur, New Delhi, etc.), Town planning after independence (Case studies – Chandigarh, Gandhinagar, Amaravati, etc.).</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Town Planning after 18th Century The industrial revolution, Evolution of towns as per the functions of the towns, Constraints on city form, Elements of urban structure – Networks, Buildings, open spaces, etc. The form of the modern city in the age of automobile – Inner-city & Suburban area.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			
<p>Utopian Concepts and Contribution of Planners Robert Owen, Georges Eugene Haussmann, Arturo Soria Y Mata, Walter Griffin, Patrick Geddes, Patrick Abercrombie, Tony Garnier, Ebenezer Howard, Daniel Burnham, Le Corbusier, Clarence Perry, Frank Lloyd Wright, CA Doxiades, Lucio Costa. (Case studies – Garden Cities, Satellite Towns, first-generation Towns, and New Towns).</p>			

Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-4	
<p>Theories of Urban Planning Scope, purpose, and methods of Planning, the nature, and purpose of Town and Country Planning at National, Regional and local levels. Land-use planning, determinants of Land Use and spatial patterns of urban land use, Concentric Zone model, Sector model, Multiple Nuclei model, etc. The economic base of the city, the parts of the town and their relationship, planning standards, site layout and development, zoning, and Building Bye-Laws.</p>	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-5	
<p>Settlement Analysis Methods of analysis of Socio-Economic and Physical data; Use of techniques of Location Quotient, Coefficient of Localization; Locational attributes of activity and population; Techniques for the Understanding structure of urban areas, land values, and density patterns; space standards for facility areas, utilities, and networks; Population, Distance criteria; Performance standards; Case studies.</p> <p>Plan Preparation Techniques The setting of Goals and Objectives; Methodologies for preparation of structure plan and strategy plan techniques; plan implementation techniques; public participation and plan implementation; techniques of urban renewal and central area redevelopment; Contents of a structured plan</p>	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
<p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • Three Unit Tests each of 20 Marks • Two assignments each of 20 Marks or one Skill Development Activity of 40 marks to attain the Cos and POs <p>The sum of three tests, two assignments/skill Development Activities, will be scaled down to 50 marks CIE methods /question paper is designed to attain the different levels of Bloom’s taxonomy as per the outcome defined for the course.</p> <p>Semester End Examination:</p> <ol style="list-style-type: none"> 1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50. 	

2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module. Some subjects can choose to have a compulsory question under any one module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

Suggested Learning Resources:

Books

1. A.E.J. Morrises, 1994, *History of Urban Form: Before the Industrial Revolution*, Routledge, New York, 3rd Ed.
2. Frederick Gibberd, 1959, *Town Design*, Praeger
3. Stephen V. Ward (ed), 1992, *The Garden City: Past, present, and future*, Routledge, published in 2011.
4. David Adams, 1994, *Urban Planning and Development process*, UCL Press London
5. Jay M Stein, 1994, *Classic Readings in urban planning: An introduction*, McGraw-Hill, New York
6. C.A. Doxiades, 1976, *Action for Human Settlements*, Athen's, Centre of Ekistics.
7. William H. Wilson, 1989 *City Beautiful Movement*, The Johns Hopkins University Press, Baltimore, and London.
8. Arthur Korn, 1953, *History Builds the Towns*, Lund, Humphris, London.
9. Arthur B. Gallion, 1975, *Urban Pattern*, Van Nostrand Reinhold Inc, U.S.; 3rd Revised edition
10. Lewis Mumford, 1938, *Culture of Cities*, Harcourt Brace Jovanovich.
11. P. Geddes, 1915, *Cities in Evolution*, McGraw Hill,
12. Dutta, 2009, *Ancient Town Planning in India*, Isha Books, India.
13. Lewis Keeble, 1969, *Principles of Town and Country Planning*. Estates Gazette Ltd, London, 4th edition.
14. K.S. Ramegowda, 1972, *Urban and Regional Planning*, Prasaranga, University of Mysore
15. Rangwala, 2015, *Town planning in India*, Charotar Book Distributors, India, 28th Ed.

Web links and Video Lectures (e-Resources):

- Planetizen Courses:
<https://www.youtube.com/c/PlanetizenCourses>

Skill Development Activities Suggested

- Guest Lectures.
- 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	Have a better understanding of Ancient, medieval and modern planning practices	L2
CO2	Evaluate the works of prominent urban philosophers and Planning theories	L4
CO3	Gain a better understanding of Urban & Regional Planning techniques	L3
CO4	Understanding the process and preparation of structure plan	L5

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	0	0	M	H	H	M	0	H
CO2	H	0	0	M	H	H	M	0	H
CO3	H	0	0	M	H	H	M	0	H
CO4	H	0	M	M	H	H	M	M	H

H – High, M – Medium, L – Low

ELEMENTS OF SMART CITY PLANNING			
Course Code	20SCP13	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	32	Total Marks	100
Credits	2	Exam Hours	03
<p>Course Learning objectives: By taking this course students will be able to:</p> <ul style="list-style-type: none"> • Understand the operational layers of the City's infrastructure. • Understand the significance, operations, and impact of different types of infrastructures on City functionality. • Understand the current technologies available for operations and maintenance of these city infrastructures in the Smart domain. 			
Module-1			
<p>Understanding Cities Introduction to Cities as a functional system. The overlay of different infrastructures- physical & social infrastructures.</p> <p>Planning for Urban Infrastructure Urban Infrastructure, Role of Planner in the provision of urban networks and services, feasibility studies for infrastructure projects, planning for major infrastructure projects, Various Infrastructure Programmes and policies by MOUD, PPP (DBOOT, BOOT, etc.) in infrastructure projects</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Water Supply Water– sources of water, treatment and storage, transportation and distribution, quality, networks, distribution losses, water harvesting, recycling and reuse, norms and standards of provision, institutional arrangements, planning provisions, and management issues. Network design, Economics, distribution networks, Computer applications – Appurtenances –sensor-based Leak detection. Principles of design of water supply in buildings – House service connection.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			
<p>Sanitation and Solid waste <i>Sanitation</i> – points of generation, collection, treatment, disposal, norms and standards, grey water disposal, DEWATS, institutional arrangements, planning provisions, and management issues. Storm water collection</p>			

and disposal, norms and standards, institutional arrangements, planning provisions, and management issues. *Municipal and other wastes* –generation, typology, quantity, collection, storage, transportation, treatment, disposal, recycling and reuse, wealth from waste, norms, and standards, institutional arrangements, planning provisions, and management issues.

Approach to the special category of Solid Waste i.e., E-Waste, Building & Debris Waste, Medical Waste, Food Waste, Garden Waste, etc, Scientific Landfill and reclamation of existing dump yard, Critical examinations of SWM endeavour with special emphasis on clean city rankings along with case study on solid waste management.

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Module-4

Electricity & Fire services and Renewable Energy

Electricity – Sources of electricity, distribution networks, demand assessment, norms and standards, planning provisions, and management issues. Fire –fire hazards, vulnerable locations, methods of firefighting, norms, and standards, planning provisions, and management issues.

Energy Management, energy requirement, non-conventional energy systems, management of solar energy, wind energy, tidal energy, biomass energy, energy from waste.

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Module-5

Social Infrastructure – Education, Health, Civic

Social Infrastructure – Education, Health, Civic Types, hierarchical distribution of facilities, Access to facilities, provision and location criteria, Norms and standards, etc. provisions for e- education, Tele- Health

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

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

Continuous Internal Evaluation:

- Three Unit Tests each of **20 Marks**
- Two assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the Cos and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

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

Suggested Learning Resources:

Books

1. Ben Green, 2019, *The Smart Enough City: Putting Technology in Its Place to Reclaim Our Urban Future*, MIT Press.
2. Rashid Mehmood, et.al., 2020, *Smart Infrastructure and Applications: Foundations for Smarter Cities and Societies*, Springer, Switzerland.
3. Sameer Kochhar, et.al., 2008, *Infrastructure and Governance*, Academic Foundation, New Delhi.
4. Gathe Donald E Billings, et.al., 2009, *Managing urban water supply*, Dordrecht, Kulwer, Academic Press.
5. Holmes, J.R., 1984, *Manual on Municipal Solid Waste Management, The Expert Committee GoI, MoUD, CPHEEO 2000: Managing Solid Waste in Developing Countries*

Web links and Video Lectures (e-Resources):

- Congress for New Urbanism:
<https://www.youtube.com/user/Congress4NewUrbanism>
- Not Just Bikes:
<https://www.youtube.com/c/NotJustBikes>

Skill Development Activities Suggested

- Guest Lectures.
- Seminars/ Webinars
- Site Visits to Utility Service providers/ agencies to understand the operations and management of the City's utilities

Course Outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Have a complete understanding of Utilities provision and management in a city	L2
CO2	Understand the operational complexities of a city's utility services	L2
CO3	Evaluate the Utility Management Plan of any City	L5
CO4	Evaluate the new technologies and emerging practices in Utility Management	L4
CO5	Understand the implementation of the different scopes of Infrastructure and Public projects	L2

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	M	H	M	M	H	M	L	H
CO2	H	L	H	M	M	M	M	0	H
CO3	H	M	H	M	M	H	M	M	H
CO4	H	0	M	M	M	H	M	0	H
CO5	H	H	H	M	M	H	M	M	H

H – High, M – Medium, L – Low

Remote Sensing and GIS-1			
Course Code	20SCP14	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	4 hrs (1:1:2)	Viva Marks	50
Total Hours of Pedagogy	64	Total Marks	100
Credits	2		
<p>Course Learning objectives: By taking this course:</p> <ul style="list-style-type: none"> Students are expected to have obtained the necessary skills in describing, illustrating the concepts of Urban data management. Understand the concept of Remote Sensing applications in Town & Country Planning, also applying the elements of GIS and Geo-Spatial platforms for data analyzation 			
Module-1			
<p>Remote Sensing Lecture: Concept and Scope of Remote Sensing: Definitions, Process, and Characteristics of Remote Sensing System, Advantages and limitations. Concept of Electromagnetic Radiation (EMR): Wavelength-frequency-energy relationship of EMR, EMR Spectrum and its properties, EMR wavelength regions and their applications, Energy Interaction in the atmosphere: Scattering, absorption, transmission, atmospheric windows. Energy Interactions with Earth Surface Features.</p> <p>Practical</p> <ul style="list-style-type: none"> Show Remote Sensing software platform (like ERDAS) and GIS platforms (such as ArcGIS, QGIS, etc.) and students can get a hang of the new software and its UI. Make ppts for different Indian and global sensors (Spatial, spectral, temporal, radiometric resolution, launch date, swath, coverage, country of launch, usages, sample images any other noteworthy mentions) 			
Teaching-Learning Process	<p><i>Blended learning: Power point presentation to elaborate more on key topics.</i> <i>Practical: Application of concepts into GIS/RS software and producing a portfolio</i></p>		
Module-2			
<p>Remote Sensing Lecture: Types and Characteristics of Sensor: Imaging and non-imaging sensors, Active and passive sensors, Resolution of Sensors - Spectral, Spatial, Radiometric & Temporal, Scale, Mapping unit, multi-band concepts, and False Colour Composites, Orbital Characteristics – Coverage, Passes, Pointing Accuracy, types of orbits. Multispectral and Hyper-spectral RS, Radar, Lidar; Feature identification and identification keys</p> <p>Practical</p> <ul style="list-style-type: none"> File import and conversion False-colour composite and visual identification Layer stack, Mosaic, creation of AOI and image subsets/clipping Feature identification Spectral profile generation <p>Viva deliverables for remote sensing</p> <ol style="list-style-type: none"> Layer stack and mosaiced images of any two satellite images in standard FCC and True colour 			

composite 2. Visual change detection for any city between 2 time periods 3. Feature identification using identification keys for city/region with ground truth images 4. Spectral profile generation with inferences and analysis for any given place	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i> <i>Practical: Application of concepts into GIS/RS software and producing a portfolio</i>
Module-3	
GIS Lecture: Basic Concepts: definition of GIS, Components of GIS, Variables - points, lines, polygon, Functionality of GIS, Areas of GIS application, Advantage and Limitation of GIS Practical: to be presented by students Understanding basic geography required for GIS (Understanding cartesian co-ordinates, Geographic co-ordinate system and Projected co-ordinate system, latitudes & longitudes, conversion of lat-long between different formats, understanding resolutions in ‘arc seconds’ and conversion between arcseconds to meters (for standard resolutions like 1km, 100km, 10m, etc), Northing and Easting, Differentiate between real earth surface, geoid, and ellipsoid, Define horizontal datum, vertical datum, and their major components, map scales and map projection (different types), Identify major characteristics of UTM and find the UTM zone for any given region (e.g. a county)	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i> <i>Practical: Application of concepts into GIS/RS software and producing a portfolio</i>
Module-4	
GIS Lecture: GIS Data: Spatial and Attribute Data, Data Structures - Raster and Vector data structures, GIS Software, and formats, Geo-database. Digitization, georeferencing, spatial and non-spatial data Practical: <ul style="list-style-type: none"> • Getting familiar with GIS platforms • Georeferencing the images/toposheets • Digitization of point-like and polygon • Creation of attributes • Conversion between various projections and file types 	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i> <i>Practical: Application of concepts into GIS/RS software and producing a portfolio</i>
Module-5	
Digital Cartography Lecture: Nominal, Ordinal, Interval and Ratio Scales, Qualitative vs. Quantitative data, Discrete vs. Continuous data. Practical: <ul style="list-style-type: none"> • Creating visually well-composed maps • Map elements • Composition and colour scheme in a map 	

Viva deliverable	
<ol style="list-style-type: none"> 1. Georeferenced Toposheet 2. Well composed Base map of a studio project with various thematic layers 3. A report on geographic elements required for understanding GIS 	
Teaching-Learning Process	<p>Blended learning: Power point presentation to elaborate more on key topics.</p> <p>Practical: Application of concepts into GIS/RS software and producing a portfolio</p>
Assessment Details (both CIE and SEE)	
<p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Viva voce is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in Viva is 50% 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 Viva- Voce taken together.</p>	
Continuous Internal Evaluation:	
<p>CIE marks shall be awarded by a committee comprising of Principal/Dean, Special Officer/ PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.</p>	
Viva voce Examination:	
<ul style="list-style-type: none"> • The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD. • The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner. • The viva-voce marks awarded for PSC (Professional supportive course), shall be based on the evaluation of report submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10. • The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution. 	
Suggested Learning Resources:	
Books	
<ol style="list-style-type: none"> 1. Crown R.G. and S. John,1984, <i>Computers and Information Systems</i>. McGraw Hill Book Company, Mumbai. 2. De Bruijin (ed.), 1986, <i>Urban Information System and Low-Cost Survey Techniques: International Workshop on Urban and Regional Planning Information Systems</i>. NRS and ITC, New Delhi. 3. Brenda White: <i>Urban Information Systems</i>, 4. Rhind and H. Mounsey,1989, <i>Understanding GIS</i>. Taylor and Francis. London. 5. C.J.Date, A. Kannan S. Swamynathan,2009, <i>An Introduction to Database Systems</i> (8th Ed.), Pearson Education. 6. Raghu Ramakrishnan, Johannes Gehrke, 2002, <i>Database Management Systems</i>, McGraw-Hill. 7. Elmasri and Navathe, 2011, <i>Fundamentals of Database Systems</i> by (6th Ed.), Addison-Wesley. 8. Geoffrion, A.M., 1983, "Can OR/MS evolve fast enough?" <i>Interfaces</i> 13:10. Source for six essential characteristics of DSS. 9. House, W.C. (ed.), 1983. <i>Decision Support Systems</i>, Petrocelli, New York. Basic DSS text. 10. P.S. Roy, 2000. <i>Natural Disaster and their mitigation</i>. Published by Indian Institute of Remote Sensing (IIRS). 11. Schultz, G. A., and Engman, E. T., 2000, <i>Remote Sensing in Hydrology and Water Management</i>, Springer-Verlag, Berlin, Germany. 	

Web links and Video Lectures (e-Resources):

- ESRI:
<https://www.youtube.com/user/esrity>
- Geo Delta Labs:
<https://www.youtube.com/c/GeoDeltaLabs>

Skill Development Activities Suggested

- History of Remote Sensing Scenario in Global and Indian Context. Specification of some popular satellites – IRS, Landsat, and SPOT series; High-resolution satellites – IKONOS, Cartosat, Quickbird, OrbView, GeoEye, Pléiades, World-View; Other latest earth resource satellites. (Basics info of the above)
- Understanding the evolution and history of GIS, looking at the difference between analogous and digital maps

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Have a fundamental knowledge of Geographic data imagery and its systems	L2
CO2	Collect and analyze the Geographic Information of any region using relevant applications	L4
CO3	Distinguish between the satellite imagery used for various data applications	L3
CO4	Prepare projects by collecting the data from any imagery system and analyse it	L6
CO5	Create analytical representative maps using GIS software	L6

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of Cos and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	0	H	M	M	H	M	0	H
CO2	H	0	H	M	M	H	M	0	H
CO3	H	0	H	M	M	H	M	0	H
CO4	H	0	H	M	M	H	M	0	H
CO5	H	0	H	M	M	H	M	0	H

H – High, M – Medium, L – Low

DATA SCIENCE FOR PLANNING			
Course Code	20SCP15	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	2 hrs (1:1:0)	Viva Marks	50
Total Hours of Pedagogy	32	Total Marks	100
Credits	2		
<p>Course Learning objectives: By taking this course students will be able to:</p> <ul style="list-style-type: none"> • Understand the applications of Computers and Coding for data analytics. • Understand database management principles and data organization. • Learn the basics of coding for the execution of analytics for data on city planning. 			
Module-1			
<p>Introduction to Computers Introduction to Computers, Data representation, Conversion of data. Memory organization, Different secondary storage devices and Magnetic media devices, Translators, Types of Programming languages, Data Representation, Data Science, and applications to Cities.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Operating Systems & DBMS Information Technology and Operating System: Information Technology Infrastructure Hardware, software, and Data related issues, Systems Application software, Enterprise software, Operating System Concepts, Structures, Files, Directories, Process and Memory management. Relational database system, DBMS, Data Flow Diagrams, Logical Data models, Data Warehouses, Meta Data, Global Databases, Spatial Databases available for natural resources, and Terrain.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			
<p>Introduction to C- Programming <i>C Programming:</i> Basic structure of C programming, executing a C program. Constants, variables, and data types. Operators and expressions. Managing input and outputs, operations, conditional branching, and loops. Arrays (1D & 2D)- character arrays and strings. Basic algorithms: searching and sorting, linear search, binary search, bubble sort, selective sort Reaction and user-defined functions.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		

Module-4**Introduction to Python Program**

Parts of python programming language, keywords, data types, reading input, printing output, conditions and loop statements, functions definition, and calling a function.

Lists- creating lists, basic list operation- Tuples, dictionaries, data pre-processing and data visualization, PANDAS, NUMPY, MATPLOTLIB, SEABORN

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Module-5**PRACTICALS**

- C Programming Language: Basics, Statements, Loop, Array, String, Pointer, Execution of basic programs.

Implement the programs with WINDOWS / LINUX platform using the appropriate C compiler.

1. Design and develop a flowchart or an algorithm that takes three coefficients (a, b, and c) of a Quadratic equation ($ax^2+bx+c=0$) as input and computes all possible roots. Implement a C program for the developed flowchart/algorithm and execute the same to output the POSSible roots for a given set of coefficients with appropriate messages.
 2. Design and develop an algorithm to find the reverse of an integer number NUM and check whether it is PALINDROME or NOT. Implement a C program for the developed algorithm that takes an integer number as input and outputs the reverse of the same with suitable messages. Ex: Num: 2014, Reverse: 4102, Not a Palindrome
 3. Design and develop a flowchart to find the square root of a given number N. Implement a C program for the same and execute for all POSSible inputs with appropriate messages. Note: Don't use library function sqrt(n).
 4. Design and develop a C program to read a year as an input and find whether it is a leap year or not. Also, consider the end of the centuries.
 5. Develop an algorithm, implement and execute a C program that reads N integer numbers and arranges them in ascending order using Bubble Sort.
- Python programming:
 1. Simple demonstrative python programs
 2. Write a python program to perform a linear search
 3. Implement a python program to demonstrate:
 - a. Importing data sets- using the PANDAS library
 - b. Clearing the data
 - c. Data frame manipulation- using the NUMPY library
 4. Implement a python program to demonstrate data visualization with various types of graphs using NUMPY
 5. Implement a python program to demonstrate data visualization using SEABORN

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Viva voce is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in Viva is 50% 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 Viva- Voce taken together.

Continuous Internal Evaluation:

CIE marks shall be awarded by a committee comprising of Principal/Dean, Special Officer/ PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report.

Viva voce Examination:

- The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.
- The Viva-voce will be evaluated by two external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.
- The viva-voce marks awarded for PSC (Professional supportive course), shall be based on the evaluation of report submission, presentation skill and performance in Question-and-Answer session in the ratio 30:10:10.

The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

Suggested Learning Resources:**Books**

1. Evangelos Petroutsos, 1998, *Mastering Visual Basic 6.0*, BPB Publications, Edition.
2. Mohammed Azam, *Programming with VB 6.0*, Vikash Publishing House Pvt. Ltd.
3. Rajaraman Y, 1999, *Fundamentals of Computers*, Prentice Hall of India, New Delhi.
4. Mano, M., *Digital Logic and Computer Design*
5. Pal, S.K, 1999, *Statistics for Geoscientists*, Concept Publishing Company, New Delhi:
6. R G Dromey, 1999, *How to solve it by Computer*, PHI, Edition
7. Scott Warner, 1999, *Teach Yourself Visual Basic 6.0*, TMH
8. Walford, P, 1995, *Geographical Data Analysis*, John Wiley and Sons Inc., New York:446p.
9. Yashwant Kanetkar, 2001, *Let us C*, BPB Publications.

Web links and Video Lectures (e-Resources):

- Singapore University of Technology & Design:
<https://www.youtube.com/watch?v=85Up1MzQP48>
- Simplilearn:
<https://www.youtube.com/watch?v=X3paOmcTjQ>

Skill Development Activities Suggested

- Guest Lectures
- Webinars
- Laboratory practice

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 Computer Applications and their use in data analytics	L2
CO2	Assess the database management of Urban data	L4
CO3	Execute data processing using C-programming or Python	L5

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	L	0	H	H	0	L	M	0	H
CO2	H	L	H	H	M	M	L	L	H
CO3	0	0	M	H	M	0	H	L	H

H – High, M – Medium, L – Low

RESEARCH METHODOLOGY & IPR			
Course Code	20SCP16	CIE Marks	50
Teaching Hours/Week (L:S: SDA)	2 hrs (2:0:0)	SEE Marks	50
Total Hours of Pedagogy	32	Total Marks	100
Credits	2	Exam Hours	03
<p>Course Learning objectives: By taking this course students will be able to:</p> <ul style="list-style-type: none"> • Understand the significance and process of conducting research, in particular with the practical application in the Planning discipline • Provide them with the process outline assisting them in their Dissertation. • Elucidate the significance of appropriate data collection and analysis methods applicable for solving city problems. 			
Module-1			
<p>Research Methodology: Introduction, Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India.</p> <p>Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, with an Illustration.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Reviewing the literature: Place of the literature review in research, bringing clarity and focus to the research problem, improving research methodology, broadening knowledge base in the research area, Review of the literature, searching the existing literature, reviewing the selected literature, developing a theoretical framework, developing a conceptual framework, writing about the literature review.</p> <p>Research Design: Meaning of Research Design, Need for Research Design, features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Important Experimental Designs.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			

<p>Data Collection: Introduction, Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method.</p> <p>Measurement and Scaling: Qualitative and Quantitative Data, Classifications of Measurement Scales, Goodness of Measurement Scales, Sources of Error in Measurement, Techniques of Developing Measurement Tools, Scaling, Scale Classification Bases, Scaling Techniques, Multidimensional Scaling, Deciding the Scale.</p> <p>Design of Sample Surveys: Design of Sampling: Introduction, Sample Design, Sampling, and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs.</p>	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-4	
<p>Testing of Hypotheses: Hypothesis, Basic Concepts Concerning Testing of Hypotheses, Statistics and Critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Hypothesis Testing for Mean, Proportion, Variance, for Difference of Two Variances, P-Value approach, Power of Test, Limitations of the Tests of Hypothesis.</p> <p>Interpretation and Report Writing: Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Mechanics of Writing a Research Report, Precautions for Writing Research Reports</p>	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-5	
<p>Intellectual Property: The Concept, Intellectual Property System in India and abroad, Development of TRIPS Complied Regime in India, Patents Act, 1970, Trade Mark Act, 1999, The Designs Act, 2000, Copyright Act, 1957, The Protection of Plant Varieties and Farmers' Rights Act, 2001, Trade Secrets, Utility Models, IPR and Biodiversity, Competing Rationales for Protection of IPRs, Leading International Instruments Concerning IPR, World Intellectual Property Organisation (WIPO), WIPO and WTO, Paris Convention for the Protection of Industrial Property, National Treatment, Right of Priority, Common Rules, Patents, Marks, Trade Names, Indications of Source, Unfair Competition, Patent Cooperation Treaty (PCT), Advantages of PCT Filing, Berne Convention for the Protection of Literary and Artistic Works, Basic Principles, Duration of Protection, Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, Covered under TRIPS Agreement, Features of the Agreement, Protection of Intellectual Property under TRIPS, Copyright and Related Rights, Trademarks, Geographical indications, Patents, Patentable Subject Matter, Rights Conferred, Exceptions, Term of protection, Conditions on Patent Applicants, Process Patents, Other Use without Authorization of the Right Holder, Protection of Undisclosed Information, Enforcement of Intellectual Property Rights, WTO.</p>	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>

Assessment Details (both CIE and SEE)

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

Continuous Internal Evaluation:

- Three Unit Tests each of **20 Marks**
- Two assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the Cos and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

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

Suggested Learning Resources:**Books**

1. Alan Bryman, 2015, *Social Research Methods*, OUP Oxford; 5th edition.
2. C.R. Kothari, Gaurav Garg, *Research Methodology: Methods and Techniques* New Age International 4th Edition,
3. Ranjit Kumar, 2011, *Research Methodology a step-by-step guide for beginners* (For the topic Reviewing the literature under module 2) SAGE Publications Ltd. 3rd Edition.
4. *Intellectual Property Rights, Law, and Practice*, The Institute of Company Secretaries of India, Statutory Body Under an Act of Parliament, September 2013

Web links and Video Lectures (e-Resources):

- NPTEL-IOC IITM
<https://www.youtube.com/watch?v=E2gGF1rburw>
- IIT Roorkee:
<https://www.youtube.com/watch?v=2y-6GnKDUHg>

Skill Development Activities Suggested

- Guest Lecture from industry experts.
- Attending webinars.

Course outcome (Course Skill Set)

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

Sl. No.	Description	Blooms Level
CO1	Explain about the meaning of research, its objectives, and its types.	L1
CO2	Understand to frame a research methodology for planning related issues.	L4
CO3	Explain the process of literature review, and improving research methodology	L1
CO4	Interpret the necessary data to develop a conceptual framework and theoretical framework	L2
CO5	Explain about conducting surveys, data collection, and choosing appropriate methods of data collection	L1
CO6	Use hypothesis techniques to extrapolate data from samples.	L3
CO7	Interpret the data and write research reports.	L2

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	M	M	M	0	L	H	L	L
CO2	H	M	M	M	0	L	H	L	L
CO3	H	M	M	M	0	0	H	0	M
CO4	H	0	M	M	0	0	H	0	M
CO5	H	H	M	M	0	0	H	L	H
CO6	H	L	M	M	0	0	H	0	M
CO7	H	L	M	M	0	0	H	L	M

H – High, M – Medium, L – Low

REGIONAL PLANNING TECHNIQUES			
Course Code	20SCP171	CIE Marks	100
Teaching Hours/Week (L:S: SDA)	2 hrs (2:0:0)	SEE Marks	--
Total Hours of Pedagogy	32	Total Marks	100
Credits	2		
<p>Course Learning objectives: By taking this course Students will be able to:</p> <ul style="list-style-type: none"> • Understand the significance of Village Planning, with the current proposals for Rural Development Schemes by the Indian Govt. • Understand the concept, classification and delineation of planning regions using the different techniques • Understand the principles of preparation of a district plan, and multi-level planning. 			
Module-1			
<p>Introduction to Village Planning</p> <p>Nature of rural communities-Structure and forms of rural settlements, National planning, and rural development. Rural economy- Planning for the rural economic base, Agriculture, and other primary sectors. Rural Local Governments and rural Institutions in development activities- 73rd Constitution Amendment Act and its impact on rural development.</p> <p>Evaluation of rural development programs of central and state governments like MGNREGA, PMGSY, NBA, PMAY, NRIDP, NRHM, AMRUT, PURA, Bharat Nirman, etc. Planning for rural infrastructure-Energy, roads, water supply, sanitation, and rural services–Agro services. Appropriate Technology for rural development like the use of local resources, Rain water Harvesting, water recharge, and soil conservation and waste land development. Village Industries and village trade and services.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Introduction to Regional Planning</p> <p>Aims and Objectives and need for regional planning- Concept, Types, and Classification of regions. Delineation of planning regions by various Techniques-Principal component method, Composite index, Ridge line technique, Gravity potential technique, Boundary girdle method. Regional Planning and Economic Development-Backward regions and Developed regions, Characteristics and reasons for backwardness. Case study of any regional plan, Introduction to regional analysis. Linear Programming, Input and Output Analysis- Growth Model, Core-periphery models. Application of Regional techniques in District Planning</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		

Module-3	
Theories of Regional Development Regional Development Theories-W. Christaller (Central Place theory), Von Thunen (Theory of agricultural location), Losch (General theory of location), A.Weber (Industrial location theory), and W. Isard (Theory of location and space economy).	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-4	
Levels of Planning Multilevel planning– Needs and methods of multi-level planning in India. Growth-Foci concept, regional planning as a tool to integrate rural and urban areas. District Planning: Integrated approach to district level planning (vertical and horizontal spatial integration); Rural-Urban spatial relationship. District Development Plans– Guidelines for District Planning: Content and context and methodologies.	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-5	
Smart Village Understanding Concept of Smart Village, Issues of Smart Village, Smart Village Performance Benchmark, Smart Village Policy and Mission, Planning and Management of Smart Village- A Case study of smart Village "PUNSARI" along with economics, Financing Smart Villages, Renewable energy in smart village.	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Assessment Details (CIE only) The weightage of Continuous Internal Evaluation (CIE) is 100%. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the CIE (Continuous Internal Evaluation). Continuous Internal Evaluation:	
<ul style="list-style-type: none"> • Three Unit Tests each of 20 Marks • Two practical assignments each of 20 Marks or one Skill Development Activity of 40 marks to attain the Cos and POs • The total or the sum of all the unit tests, practical assessments/ SDA is 100 marks 	
Suggested Learning Resources:	
Books	
<ol style="list-style-type: none"> 1. R.P.Misra, 1998, <i>Regional Planning: Concepts, Techniques, and case-studies</i>, Concept Publishers, New Delhi. 2. W. Isard, 1950, <i>Methods of Regional Analysis- An Introduction to Regional Science</i>. MIT Press, Cambridge. 	

3. Chand Mahesh and V.K. Puri, 1983, *Regional Planning in India*, Allied Publishers, NewDelhi.
4. K.V. Sundaram, 1984, *Urban and Regional Planning in India*, Vikas Publishing House, New Delhi.
5. Hansen M. (Ed), 1996, *Regional Policy and Regional Integration*, Edward Edgar U.K.
6. R.P. Misra. (Ed), *Regional Planning*, UNCRD Nagoya, Japan 10 volumes.
7. K.V. Sundaram, *Rural Area Development*, Concept Publishers, New Delhi.
8. IIPA: *Rural Administration*.
9. Government of Karnataka: *Karnataka Panchayat Raj Act*.
10. H.A.Hye, 1986, *Integrated approaches to Rural Development*. Sterling Publishers, NewDelhi.
11. B.S. Khanna, 1991, *Rural Development in South Asia*. Allied Publishers New Delhi.
12. R.P. Misra (Ed), 1981, *Rural Development and National policies and Experiences*. UNCRD Nagoya

Web links and Video Lectures (e-Resources):

- The Geoecologist:
<https://www.youtube.com/c/TheGeoecologist>
- IIT Roorkee:
https://www.youtube.com/playlist?list=PLLy_2iUCG87AAaDRVrD02Y1z44OXt5shB

Skill Development Activities Suggested

- Guest Lectures
- Webinars
- 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	Have a better understanding of dynamics of Rural Planning	L2
CO2	Evaluate the theories pertaining to regional development	L5
CO3	Gain a better understanding of Regional Planning techniques	L2
CO4	Understanding the norms and practices of Regional Planning in India	L4

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	0	0	M	H	H	M	0	H
CO2	H	0	0	M	H	H	M	0	H
CO3	H	0	0	M	H	H	M	0	H
CO4	H	0	0	M	H	H	M	0	H

H – High, M – Medium, L – Low

URBAN DESIGN & LANDSCAPE			
Course Code	20SCP172	CIE Marks	100
Teaching Hours/Week (L:S: SDA)	2 hrs (2:0:0)	SEE Marks	--
Total Hours of Pedagogy	32	Total Marks	100
Credits	2		
<p>Course Learning objectives: By taking this course students will be able to:</p> <ul style="list-style-type: none"> Understand the Urban design and the significance of aesthetics and landscaping in the public domain. Evaluate how public and natural spaces are impacted by human interaction and make them more functional 			
Module-1			
<p>Introduction Urban Design terminologies & definition, Relevance of Urban Design in Planning & Architecture Urban Renewal, Rehabilitation, Revitalization, Redevelopment and Conservation, Urban design – an integral part of Urban planning, Urban Design Theory, and Principles</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Features of Urban Design Urban form and its determinants by the interplay of masses, voids, building typology Scale, harmony, symmetry, color, texture, light and shade Dominance, height, urban signage and graphics, Public Realm, organization of spaces and their articulation in the form of squares, streets, vistas, and focal points, Image of the city and its components such as edges, paths, landmarks, street features, skyline,</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			
<p>Surveys Survey techniques for urban aesthetics, Steps to carry out Visual survey and its recordings, Contents, and development of an aesthetic plan, and urban design schemes. Case studies of urban design characteristics of cities in India and abroad, Related issues for public intervention. Role of urban designer</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-4			

Introduction to Landscape

Landscape as a broad terminology, Natural and Man-modified landscapes. Brief history and the growth of landscape architecture as a design and planning profession from gardens to regional landscapes. Scope and nature of professional work in contemporary landscape architecture, changing priorities of disciplinary approach: ecology, biodiversity and sustainability Objective of landscape planning, environmental impact on the landscape. Landscape impact on the environment, Landscape design, and concepts used in different countries. Landscape design is related to land use, and various landscape plans.

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Module-5**Landscape in Planning**

Norms for open spaces and landscape planning. Types, hierarchy, rules and laws, functions, and importance of open spaces. Gardens and parks, National and regional parks, and Special parks. Landscape planning in association with new projects like an expressway, river roads, homes for the blind, etc. Characteristics and components of open space patterns in towns and cities (traditional and contemporary) Basic types: streets, squares, plazas, gardens, river ghats and playgrounds, public parks at district, local, and neighborhood levels, Street furniture as a component of the urban landscape, Process of designing a functional landscape Plan

Teaching-Learning Process

Blended learning: Power point presentation to elaborate more on key topics.

Assessment Details (CIE only)

The weightage of Continuous Internal Evaluation (CIE) is 100%. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the CIE (Continuous Internal Evaluation).

Continuous Internal Evaluation:

- Three Unit Tests each of **20 Marks**
- Two practical assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the COs and POs

The total or the sum of all the unit tests, practical assessments/ SDA is 100 marks

Suggested Learning Resources:**Books**

1. Spreiregen, Paul. D, *Urban Design: The architecture of towns & cities*, McGraw-Hill publications, New York.
2. Gordon Cullen, 1961, *Townscape*, Architectural Press, Routledge.
3. Claude S Fischer, 1976, *The Urban Experience*, Harcourt Brace Jovanovich,
4. Edmund N Bacon, 1976, *Design of cities*, Penguin Publishing Group
5. Frederick Gibberd, 1959, *Town Design*, Praeger
6. Gallion, A B, 2005, *The urban pattern: city planning and design*, CBS publishers, India, 5th Ed.
7. Kevin Lynch, 1950, *The Image of the City*, MIT Press
8. Cliff Moughtin, 1992, *Urban Design: Street and square*, Butterworth Architecture.

9. Michael Larice, Elizabeth Macdonald, 2007, *The Urban Design Reader*, Routledge
 10. Douglas Farr, 2011, *Sustainable Urbanism: Urban Design with Nature*, Wiley & Sons
 11. William M. Marsh, 2005, *Landscape Planning: Environmental Applications*, Wiley & Sons

Web links and Video Lectures (e-Resources):

- Peoples TV Education:
<https://www.youtube.com/watch?v=q2SmO7pPIPg>
- EDU-ARCHS:
<https://www.youtube.com/watch?v=ORxhMiRHEpk>

Skill Development Activities Suggested

- Guest Lectures
- Webinars
- 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 the theories and components of Urban Design	L2
CO2	Understand how the public spaces and forms affect the Urban Landscape	L2
CO3	Evaluate the various norms and practices in the Indian and Global contexts for Urban design and landscape	L4
CO4	Create a functional landscape plan for a public space	L6

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
8	Appraise professional standards and ethical responsibilities as a team member.	PO8
9	Acquire outstanding knowledge and understanding of the current and emerging trends in Urban Planning with the introduction of Sustainability, Smart Cities, Data-Centric Planning and Management, etc.	PO9

Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	0	H	M	M	H	M	0	H
CO2	H	M	H	M	M	H	M	M	H
CO3	H	0	H	M	M	H	M	0	H
CO4	H	M	H	M	M	H	M	L	H

H – High, M – Medium, L – Low

URBAN RENEWAL			
Course Code	20SCP173	CIE Marks	100
Teaching Hours/Week (L:S: SDA)	2 hrs (2:0:0)	SEE Marks	--
Total Hours of Pedagogy	32	Total Marks	100
Credits	2		
<p>Course Learning objectives: By taking this course students will be able to:</p> <ul style="list-style-type: none"> • Understand the lifecycle of cities and their impact on the decline. • Understand the necessities, and approaches to renewal/conservation of cities. • Evaluate the snapshot of the urban conservation policies of India. 			
Module-1			
<p>Introduction Urban redevelopment/renewal/reconstruction/regeneration – definitions and distinctions; Urban redevelopment as a part of the urban plan; Identification of areas to be redeveloped; Conservation, rehabilitation, and redevelopment – the interrelationship. Surveys for renewal and sources of data, Methods of analysis</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-2			
<p>Economic, Financial, and Management Aspects Economic and spatial implications of urban renewal programs; Mobilization of resources; Urban renewal through Incentive zoning. Problems and prospects of renewal in Indian cities, Urban renewal a comparative study</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-3			
<p>Urban conservation and Policies What and Why to conserve, Conservation Approaches, History of Conservation Movement Internationally and in India, Philosophy & Discourses; Differing schools of thought, Scope of Conservation in Indian Context, International Bodies, Charters & Trends: ICOMOS/ICCROM /INTACH Charters and changing trends. Policies for urban renewal, Legislation for renewal.</p>			
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>		
Module-4			

Urban Renewal	
Methodology for urban renewal, Alternative strategies for urban renewal, Preparation of plans, implementation, costing and phasing, Case Study, and Report Writing.	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Module-5	
Legal and Administrative Aspects	
Implementation of urban renewal programs – an overview of national and international experiences; Legal and administrative aspects: archaeological acts/ charters and institutional mechanism in urban redevelopment and conservation in India	
Teaching-Learning Process	<i>Blended learning: Power point presentation to elaborate more on key topics.</i>
Assessment Details (CIE only)	
The weightage of Continuous Internal Evaluation (CIE) is 100%. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the CIE (Continuous Internal Evaluation).	
Continuous Internal Evaluation:	
<ul style="list-style-type: none"> • Three Unit Tests each of 20 Marks • Two practical assignments each of 20 Marks or one Skill Development Activity of 40 marks to attain the COs and POs 	
The total or the sum of all the unit tests, practical assessments/ SDA is 100 marks	
Suggested Learning Resources:	
Books	
<ol style="list-style-type: none"> 1. Gehl, J. Gemzoe, L, 1996, <i>Compendium in town renewal and urban planning</i>, 2. Chris Couch, 2003, <i>Urban regeneration in Europe</i>, Blackwell Science. 3. Edward Ng (Ed.), 2010, <i>Designing high-density cities- For Social and Environmental Sustainability</i>, Routledge. 4. JNURM, Govt of India 	
Web links and Video Lectures (e-Resources):	
<ul style="list-style-type: none"> • Science Magazine: https://www.youtube.com/watch?v=YuRjeUkNf9o • Realty NXT: https://www.youtube.com/watch?v=nht5nbmGdE8 	
Skill Development Activities Suggested	
<ul style="list-style-type: none"> • Guest Lectures • Webinars • 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 the need and complexities of Urban Renewal	L2
CO2	Evaluate a city based on age and decline status	L5
CO3	Prepare a renewal/rejuvenation plan for a city in decline	L5
CO4	Understand the Urban Renewal/Rejuvenation missions by the Indian Govt.	L3

Program Outcome of M. Plan (SCP) program:

Sl. No.	Description	POs
1	Acquire outstanding fundamental knowledge in the field of Urban Planning.	PO1
2	Encompass the ability to work in collaboration with interdisciplinary teams and stakeholders.	PO2
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations, use of GIS software, Policy decisions.	PO3
4	Acquire outstanding knowledge & software skills for redesign, monitoring, improving the functioning of Smart Cities and Regions.	PO4
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions.	PO5
6	Demonstrate design and policy solutions that integrate contextual, social, economic, cultural, ethical, and environmental concern of a city	PO6
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	PO7
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Mapping of COs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	H	0	H	M	M	H	M	0	H
CO2	H	M	H	M	M	H	M	M	H
CO3	H	H	H	M	M	H	M	M	H
CO4	H	L	H	M	M	H	M	0	H

H – High, M – Medium, L – Low