Master of Planning
(Urban Planning)

CURRICULUM

(Effective from 2026-27 Onwards)

DEPARTMENT OF ARCHITECTURE
NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI – 620 015, INDIA

VISION OF THE INSTITUTE

- To be a university globally trusted for technical excellence where learning and research integrate to sustain society and industry.

MISSION OF THE INSTITUTE

- To offer undergraduate, postgraduate, doctoral and modular programmes in multi-disciplinary / inter-disciplinary and emerging areas.
- To create a converging learning environment to serve a dynamically evolving society.
- To promote innovation for sustainable solutions by forging global collaborations with academia and industry in cutting-edge research.
- To be an intellectual ecosystem where human capabilities can develop holistically.

VISION OF THE DEPARTMENT

- To create a world class learning environment to meet the challenges of built environment

MISSION OF THE DEPARTMENT

- Create professionally competent and socially responsible architects with human values
- Enhance knowledge and skill through academic, research and application
- Serve the society through meaningful interactions

PROGRAM EDUCATIONAL OBJECTIVES (PEO)	
PEO 1	To develop sustainable planning professionals and researchers with strong analytical, geospatial, and interdisciplinary skills to address complex urban and regional development challenges.
PEO 2	To cultivate ethical planning practices that support inclusive, environmentally responsible, socially equitable, and economically viable urban development, while upholding professional ethics and social responsibility in creating resilient urban and regional environments.
PEO 3	To nurture graduates who effectively apply research skills, innovative planning tools, and evidence-based approaches in planning practice, governance, and academia, while demonstrating leadership, collaboration, and impart skills for adaptability in changing job markets through lifelong learning.

PROGRAM OUTCOMES (POs)

1. PO1: To enable to independently conduct planning research including analytical, geospatial, and interdisciplinary approaches.
2. PO2: To augment the capacity to prepare, evaluate, and effectively communicate structured sustainable planning proposals, policies, and implementation frameworks using appropriate analytical tools and professional standards.
3. PO3: To enhance skills to apply advanced knowledge in planning specialization to design sustainable, financially viable, and implementation-oriented development strategies.

CURRICULAR COMPONENTS

Category	**Credits Offered**
Core Courses	24
Elective Courses	12
Studio	12
Internship	02
Open Elective (OE)	06
Project Work	24
Total	80

CURRICULLUM STRUCTURE

M.PLAN (Urban Planning)

Components	Number of Courses	Credits	Total Credits
Program Core (PC)	4 / Semester (8 in 1st year)	24	36
Program Electives (PE)	2 / Semester (4 in 1st year)	12	
Essential Studio Requirements (ESR)	1 / Semester (2 in 1st year)	12	12
Internship/Industrial Training/Academic Attachment (I/A)	1	2	2
Open Elective (OE)/ Online Course (OC) #	2	6	6
Project Work Phase-I	1	12	12
Project Work Phase-II	1	12	12
Total	**19**	**80**	**80**

OPEN ELECTIVES (OE) / ONLINE COURSE (OC) (Compulsory): Students must complete 6 credits between I and IV semester either through online courses of their choice from NPTEL / Swayam (discipline electives / other electives) or through open electives offered by the PG programmes of the institute other than the programme specialization.

SEMESTER 1

S. No	Code	Course of Study	L	T	S	C	Category
1	AR751	Planning Theories	3	0	0	3	PC
2	AR753	Economics and Sociology	3	0	0	3	PC
3	AR755	Planning Techniques and Statistical Methods	3	0	0	3	PC
4	AR757	GIS and Remote Sensing Application in Planning	1	0	2	3	PC
5	AR759	Planning Studio - I	0	0	6	6	ESR
6		Program Elective I	3	0	0	3	PE
7		Program Elective II	3	0	0	3	PE
		Total	16	0	9	24	

SEMESTER 2

S. No	Code	Course of Study	L	T	S	C	Category
1	AR752	Planning Legislation and Professional Practice	3	0	0	3	PC
2	AR754	Housing and Community Planning	3	0	0	3	PC
3	AR756	Transportation Planning	3	0	0	3	PC
4	AR758	Infrastructure Planning	3	0	0	3	PC
5	AR760	Planning Studio - II	0	0	6	6	ESR
6		Program Elective III	3	0	0	3	PE
7		Program Elective IV	3	0	0	3	PE
		Total	18	0	6	24	

SUMMER TERM (Evaluation in the III semester)

S. No	Code	Course of Study	Credits
1	AR795	Internship / Industrial Training / Academic Attachment (I/A)	02

SEMESTER 3

S. No	Code	Course of Study	Credits
1	AR797	Project Work (Phase I)	12

SEMESTER 4

S. No	Code	Course of Study	Credits
1	AR798	Project Work (Phase II)	12

OPEN ELECTIVES

(Open Elective (OE) / Online Course (OC) can be completed between I – IV semester)

S. No	Code	Course of Study	Credits
1		Open elective I / Online Course	03
2		Open elective II / Online Course	03

Note: L – Lecture; T- Tutorial; S - Studio; C - Credit

PROGRAM ELECTIVES

S. No	Course Code	Course Name	C
1.	AR761	Big Data Analytics for Planning	3
2.	AR762	Disaster Management and Resilient Urban Planning	3
3.	AR763	Environment and Sustainable Behaviour in Planning	3
4.	AR764	Environmental Impact Assessment and Evaluation	3
5.	AR765	Environmental Performance of Urban Systems	3
6.	AR766	Environmental Planning	3
7.	AR767	Land Market and Real Estate Management	3
8.	AR768	Landscape Planning	3
9.	AR769	Natural Resource Management	3
10.	AR770	Planning for Smart Cities	3
11.	AR771	Planning for Special Areas	3
12.	AR772	Regional Planning	3
13.	AR773	Research Methods and Statistics	3
14.	AR774	Rural Development Planning and Governance	3
15.	AR775	Space, Place and Society	3
16.	AR776	Tourism Planning	3
17.	AR777	Urban Design and Renewal	3
18.	AR778	Urban Heritage and Conservation	3

OPEN ELECTIVES (OE) (Courses from Programme Electives, that will be Open Electives for other PG Specialization, if it is offered as Programme Elective for the respective specialization)

S. No	Course Code	Course Name	C
1.	AR761	Big Data Analytics for Planning	3
2.	AR762	Disaster Management and Resilient Urban Planning	3
3.	AR765	Environmental Performance of Urban Systems	3
4.	AR766	Environmental Planning	3
5.	AR775	Space Place and Society	3

PROGRAM CORE
SEMESTER – 1

Course Code	**:**	AR751
Course Title	:	**PLANNING THEORIES**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand evolution of settlements with socio-cultural and environmental context.
CLO2	To examine planning theories and key contributors across time periods.
CLO3	To understand planning concepts, principles, sustainability and governance dimensions.
CLO4	To analyze urban development theories and spatial structure models.
CLO5	To apply planning approaches to contemporary urban and regional challenges.

Course Content

Introduction to evolution of human settlements; transformation from early societies to complex urban systems; influence of culture, environment, resources, and technology on spatial form; concepts of scale, hierarchy, and structure in settlement patterns.

Overview of planning thought with selective historical grounding; focus on key theorists and paradigm shifts; transition from traditional to modern and post-modern planning; reduced historical detailing with emphasis on relevance to present-day planning.

Planning concepts including definitions, objectives, scope, and limitations; focus on theoretical constructs of planning paradigms and conceptual frameworks; role of climate change, resource management, infrastructure, and digital transformation in planning practice.

Urban development theories including classical and modified land use models; spatial structure, centrality, and growth dynamics; relevance and limitations in contemporary contexts influenced by globalization and connectivity.

Planning approaches including rational, systems, incremental, participatory, and equity-based models; inclusion of current trends such as smart cities, climate-responsive planning, digital governance, mobility networks, and data-driven decision-making; application to real-world planning scenarios.

Learning Resources & References:

1. Allmendinger, P. (2017). Planning Theory (3rd ed.). Palgrave Macmillan.
2. Campbell, S., & Fainstein, S. (2011). Readings in Planning Theory. Wiley.
3. Hall, P. (2014). Cities of Tomorrow (4th ed.). Wiley.
4. UN-Habitat (2020). World Cities Report.
5. World Bank (2021). Urbanization and Development Reports.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	2	3
CO1	Interpret evolution of settlements in planning context with socio-cultural and environmental influences		3	2
CO2	Analyze planning theories and contributions of key thinkers		3	
CO3	Interpret planning concepts, principles, sustainability and governance aspects	1	2	
CO4	Evaluate urban development theories and spatial structure models		3	1
CO5	Apply planning approaches to contemporary urban and regional issues	2	2	1

Course Code	**:**	AR753
Course Title	:	**ECONOMICS AND SOCIOLOGY**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand sociological concepts, demographic characteristics, and human–environment relationships in planning contexts.
CLO2	To examine community structures, settlement dynamics, inclusivity, and social planning approaches.
CLO3	To analyze economic principles, development economics, and financial systems relevant to planning.
CLO4	To evaluate infrastructure, regional development, governance, and socio-economic policy frameworks.
CLO5	To develop integrated socio-economic planning strategies using analytical and institutional approaches.

Course Content

Introduction to sociology and human–environment relationships in urban and rural contexts; socio-cultural structures, urbanization, industrialization, globalization, localization, and demographic characteristics influencing settlement patterns; inequality, gender, health, marginalized groups, and socio-political dimensions of urban life.

Understanding community structures and settlement dynamics including urban and rural transformation, slums, informal settlements, migration, safety, crime, and social exclusion; role of social planning, inclusivity, participation, governance systems, and policy frameworks in equitable settlement development and quality of life improvement.

Introduction to economic principles including demand, supply, elasticity, markets, pricing systems, production structures, economies of scale, and market behaviour; macroeconomic indicators such as income, inflation, unemployment, investment, and financial systems; economic growth versus development, poverty, employment, and human development in planning contexts.

Understanding development economics, infrastructure and economy including public and private sector roles, rural and urban economies, natural resource management, industrial restructuring, exogenous and endogenous growth, location choice, regional development, and spatial implications of economic policies on urban growth and land use systems.

Overview of socio-economic governance and planning systems including public-private partnerships, contractual frameworks, risk sharing, innovative financing methods, land-based financing instruments, debt financing, and municipal bonds; planning legislation, constitutional provisions, development controls, environmental laws, governance frameworks, institutional analysis, and citizen participation in planning processes.

Learning Resources & References:

1. Giddens, A. (2017). Sociology (8th ed.). Polity Press.
2. Kundu, A. (2019). Urban development in India: Policies and programmes. Oxford University Press.
3. Macionis, J. J. (2018). Sociology (16th ed.). Pearson Education.
4. O'Sullivan, A. (2020). Urban economics (9th ed.). McGraw-Hill Education.
5. Todaro, M. P., & Smith, S. C. (2021). Economic development (13th ed.). Pearson.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain sociological concepts, demographic characteristics, and settlement transformation processes.	2	1	1
CO2	Analyze community structures, social issues, inclusivity, and governance frameworks.	3	2	2
CO3	Evaluate economic systems, development indicators, and financial mechanisms in planning.	2	3	3
CO4	Assess infrastructure, regional growth, resource management, and spatial development patterns.	3	2	3
CO5	Prepare socio-economic planning strategies integrating governance, finance, and development frameworks.	2	3	3

Course Code	**:**	AR755
Course Title	:	**PLANNING TECHNIQUES AND STATISTICAL METHODS**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand survey techniques, data collection methods, and mapping in planning.
CLO2	To develop knowledge of analytical and regional planning techniques.
CLO3	To apply demographic and statistical methods in planning analysis.
CLO4	To understand planning standards, norms, and regulatory frameworks.
CLO5	To use statistical tools and techniques for data analysis and decision-making in planning.

Course Content

Introduction to survey techniques and mapping including data collection for physical and socio-economic surveys; understanding land use classification, coding systems, and preparation of base maps; concepts of scale, detailing, and representation for different planning levels including regional, city, and local plans.

Understanding analytical methods including regional classification, delineation techniques, and spatial structure analysis; concepts of hierarchy, rank size, and nesting; application of planning tools such as scalogram, sociogram, threshold analysis, input-output analysis, and SWOT analysis for planning evaluation.

Introduction to demographic methods including population forecasting, projections, and spatial distribution; understanding measures such as Lorenz curve, Gini ratio, and concentration indices; analysis of population characteristics and their implications in planning decisions. Introduction to data-driven analytical frameworks and decision-support techniques for planning.

Study of planning standards including spatial and performance standards, benchmarks, and variable standards; overview of development regulations, zoning controls, and planning guidelines relevant to urban and regional development.

Introduction to statistical methods including data collection, frequency distribution, and measures of central tendency and dispersion; understanding correlation, regression, and analysis of variance; application of sampling techniques, hypothesis testing, and analytical methods such as multi-criteria decision making and basic optimization techniques in planning.

Learning Resources & References:

1. Batty, M. (2013). The New Science of Cities. MIT Press.
2. Klosterman, R. E. (1990). Community analysis and planning techniques. Rowman & Littlefield.
3. Kothari, C. R. (2019). Research methodology: Methods and techniques (4th ed.). New Age International.
4. McGrew, J. C., Lembo, A. J., & Monroe, C. B. (2014). An introduction to statistical problem solving in geography. Waveland Press.
5. Spiegel, M. R., Schiller, J., & Srinivasan, R. A. (2018). Probability and statistics (4th ed.). McGraw Hill.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Apply survey techniques and prepare spatial data for planning analysis.	2		1
CO2	Analyze regions and planning systems using analytical methods.	2	2	
CO3	Perform demographic and statistical analysis for planning applications.		2	
CO4	Interpret planning standards and apply them in development proposals.	3	1	1
CO5	Use statistical tools and hypothesis testing for planning decision-making.		2	

Course Code	**:**	AR757
Course Title	:	**GIS AND REMOTE SENSING APPLICATION IN PLANNING**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	1-0-3-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand principles, components, and applications of GIS and Remote Sensing in urban, regional, and environmental planning.
CLO2	To examine spatial data acquisition, satellite imagery, geospatial databases, and remote sensing techniques for planning analysis.
CLO3	To analyze spatial patterns, land use dynamics, infrastructure systems, and environmental conditions using GIS-based analytical methods.
CLO4	To develop geospatial planning applications integrating spatial modelling, decision support systems, and suitability analysis techniques.
CLO5	To evaluate emerging geospatial technologies including AI, smart city systems, digital twins, and participatory GIS for sustainable planning.

Course Content

Introduction to geospatial technologies in planning practice - Evolution and scope of GIS and Remote Sensing - -Spatial data acquisition methods - GPS and GNSS applications in planning surveys - - Principles of Remote Sensing - Electromagnetic spectrum and spectral signatures - Satellite platforms and sensor systems - Spatial, spectral, temporal, and radiometric resolution - Applications of geospatial technologies in urban governance, smart cities, and regional planning

Visual and digital image interpretation - Image enhancement and pre-processing - Supervised and unsupervised classification - Land use and land cover mapping - Change detection analysis - Urban sprawl assessment - Thermal remote sensing applications - Urban heat island mapping - Environmental indices and vegetation analysis - UAV and drone-based mapping - Remote sensing applications in disaster management and climate resilience - National geospatial datasets and urban observatories

Spatial thinking and spatial data infrastructure-Spatial data formats and metadata - Components of GIS - Vector and raster data models - Coordinate systems, projections, and georeferencing - Topology and data quality - Spatial and attribute databases - Spatial database design and management - Metadata and spatial standards - Web GIS and cloud-based geospatial systems - Open geospatial platforms and crowdsourced spatial data - Data interoperability and spatial information systems

Spatial query and overlay analysis - Buffering and proximity analysis - Terrain and surface modelling - Network and accessibility analysis - multi-criteria decision analysis - Analytical

Hierarchy Process (AHP) - Site suitability assessment - Infrastructure and utility planning applications - Transportation and mobility analysis - Hazard zonation and vulnerability mapping - Environmental impact assessment using GIS - Spatial statistics and geospatial modelling

Planning Support Systems (PSS) and Spatial Decision Support Systems (SDSS) - Urban simulation and growth models - Smart city dashboards and urban informatics - Big data and geospatial analytics –AI and machine learning applications - Digital twins and real-time urban monitoring - Participatory GIS and community mapping - SDG monitoring and sustainability assessment - Ethical issues in geospatial technologies - Privacy, surveillance, and geospatial governance frameworks.

Learning Resources & References:

1. Burrough, P. A., & McDonnell, R. A. (2015). Principles of geographical information systems. Oxford University Press.
2. Campbell, J. B., & Wynne, R. H. (2011). Introduction to remote sensing (5th ed.). Guilford Press.
3. Jensen, J. R. (2015). Introductory digital image processing: A remote sensing perspective (4th ed.). Pearson.
4. Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). Remote sensing and image interpretation (7th ed.). Wiley.
5. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographical Information Systems and Science. Wiley.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain GIS, Remote Sensing and geospatial technologies used in planning applications.	1	2	3
CO2	Analyze spatial, environmental and infrastructure data using GIS and Remote Sensing techniques.	3	1	2
CO3	Apply spatial analysis, geospatial modelling and suitability assessment methods for planning decisions.	3	2	1
CO4	Prepare GIS-based planning proposals, thematic maps and spatial decision support outputs.	2	3	1
CO5	Evaluate emerging geospatial technologies and smart planning systems for sustainable urban development.	2	2	3

Course Code	**:**	AR759
Course Title	:	**PLANNING STUDIO - I**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	0-0-6-6
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand the fundamental process of urban and local area planning through grassroot and community-level studies.
CLO2	To examine socio-economic, physical, environmental, and infrastructure characteristics of neighbourhoods and local settlements.
CLO3	To analyze land use, housing, utility networks, and community facilities using planning surveys, GIS, and spatial analysis techniques.
CLO4	To develop context-sensitive planning proposals integrating governance systems, infrastructure, and environmental considerations.
CLO5	To prepare detailed micro-level planning and site planning schemes for neighbourhoods, communities, and local settlements.

Course Content

Introduction to planning studio and grassroots planning approaches; understanding local authority systems, neighbourhoods, wards, community settlements and rural–urban interfaces; reconnaissance survey, stakeholder interaction, socio-economic profiling and physical surveys; preparation of base maps and settlement documentation for selected local planning areas.

Neighbourhood and micro-level planning studies involving land use mapping, density analysis, housing cluster studies, circulation systems, infrastructure assessment and environmental analysis; application of GIS, spatial mapping and planning analysis tools for understanding settlement structure, utilities, public spaces and community facilities.

Community and settlement planning exercises focusing on residential sectors, local community infrastructure, utility networks and neighbourhood planning standards; identification of issues related to slums, vulnerable communities, informal settlements and environmentally sensitive areas; preparation of planning strategies responsive to local socio-cultural and ecological contexts.

Governance and implementation studies including constitutional provisions, local governance systems, planning regulations and institutional frameworks; integration of planning proposals with local authority systems and statutory planning processes; preparation of development control and infrastructure improvement strategies for local communities and special planning areas.

Preparation of detailed local area planning and site planning proposals integrating land use, mobility, infrastructure, public spaces and environmental systems; formulation of sustainable and implementation-oriented planning schemes for neighbourhoods, grassroot settlements and local communities through drawings, GIS outputs, reports and studio jury presentations.

Learning Resources & References:

1. Gehl, J. (2011). Life Between Buildings: Using Public Space. Island Press.
2. Lynch, K. (1981). A Theory of Good City Form. MIT Press.
3. Rangwala, S. C. (2018). Town Planning. Charotar Publishing House.
4. TCPO, MoHUA and MoPR (2015–2021). Urban, Regional and Rural Area Development Plans Formulation and Implementation Guidelines (URDPFI and RADPFI). Government of India.
5. UN-Habitat. (2020). World Cities Report 2020: The Value of Sustainable Urbanization. Nairobi: United Nations Human Settlements Programme.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Conduct socio-economic, land use and infrastructure surveys for neighbourhood and community planning.	3	2	1
CO2	Analyze settlement structure, housing, infrastructure and spatial characteristics using GIS and planning tools.	3	2	2
CO3	Evaluate local planning issues and formulate context-sensitive planning strategies for communities and neighbourhoods.	2	3	3
CO4	Prepare detailed micro-level and site planning schemes integrating infrastructure and environmental systems.	2	3	3
CO5	Develop sustainable and implementation-oriented planning proposals aligned with local governance systems.	2	3	3

SEMESTER – 2

Course Code	**:**	AR752
Course Title	:	**PLANNING LEGISLATION AND PROFESSIONAL PRACTICE**
Type of Course	:	Programme Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand the relationship between legislation, urban planning, and the Indian constitutional framework.
CLO2	To develop knowledge of professional practice, consultancy procedures, and fee structures in housing and spatial planning.
CLO3	To familiarize students with statutory procedures for preparing and implementing regional and master plans under Indian planning acts.
CLO4	To instill professional ethics, roles, and responsibilities of planning consultants toward clients, society, and the profession.
CLO5	To provide knowledge of legal safeguards, consultancy agreements, arbitration, and the role of professional bodies in urban governance.

Course Content

Concept of Legislation Significance and Objectives of Legislation; Constitutional basis and provisions relating to land, its development and use; Overview of legal tools in various components of Urban Planning and Development.

Planning Legislation in India and Land Acquisition and Settlement Act Evolution of Planning Legislation in India; Types and description of various Acts: Town and Country Planning Acts, Improvement Trust Act, Urban Planning and Development Authorities Act: objectives, contents, procedures for preparation and implementation of regional plans, master plans and town planning schemes; Various Acts related to urban governance; Land resources, environment protection, public participation in statutory process; Land Acquisition and Settlement Act, Town and Country Planning Act, Other Acts related to Infrastructure: NHAI, Port, Airport and Railways.

Professional Activities and Responsibilities Aims and objectives of professional institutes and bodies in planning; Professional roles and responsibilities of planning consultants; Professional ethics; Responsibilities towards clients, fellow professionals and public; Scope of services for different projects.

Consultancy Agreements and Implementation Consultancy agreements and safeguards; Fees and scales of professional charges; Negotiation, liability, code of conduct, arbitration.

Legal Instruments for Implementation and Dispute Resolution: Overview of specialized legal instruments such as Transferable Development Rights (TDR) and Town Planning Schemes (TPS); Understanding the Real Estate (Regulation and Development) Act

(RERA) and its impact on planning practice; Mechanisms for dispute resolution: Arbitration, Conciliation, and Mediation in planning contracts; Judicial interventions in planning: Public Interest Litigation (PIL) and environmental jurisprudence in India.

Learning Resources & References:

1. Institute of Town Planners, India. (2003). *Memorandum Articles of Association and Byelaws.* New Delhi.
2. Kulshrestha S. K. (2012). *Urban and Regional Planning in India: A Handbook for Professional Practice.* SAGE Publications, New Delhi.
3. Ministry of Housing and Urban Affairs (2024). *The Constitution (74th Amendment Act, 1992).* Government of India, New Delhi.
4. Ministry of Panchayati Raj (2024). *Annual Report.* Government of India, New Delhi.
5. Shah Uttam Chand (2023). *Planning Legislation covering Urban & Regional Planning and Environmental Laws in India.* Notion Press, Chennai.

Course Outcomes (CO)		**Programme Outcomes (PO)**		
		1	**2**	**3**
CO1	To comprehend the interaction between legislation and urban planning, including how legal frameworks influence urban development and planning processes.	**3**	**3**	**3**
CO2	To acquire foundational knowledge of legal concepts, the Indian constitution, and specific acts, laws, rules, and regulations related to housing and urban planning.	**3**	**3**	**3**
CO3	To identify the scope, nature, and procedural aspects of professional practice in housing and spatial planning.	**3**	**3**	**3**
CO4	To develop skills to prepare detailed consultancy proposals, including project scopes, objectives, and methodologies.	**3**	**3**	**3**
CO5	To accurately quote fees and charges for professional services, ensuring transparent and competitive pricing while adhering to professional codes of conduct.	**3**	**3**	**3**

Course Code	**:**	AR754
Course Title	:	**HOUSING AND COMMUNITY PLANNING**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand housing policies, typologies, demand and supply systems.
CLO2	To analyze housing markets, affordability and financing mechanisms.
CLO3	To evaluate community vulnerability and informal housing conditions.
CLO4	To apply neighbourhood planning standards and housing regulations.
CLO5	To develop sustainable housing and community planning proposals.

Course Content

Housing as a human right; housing policies and international declarations; housing determinants; housing need, demand and supply; housing shortage and affordability; Census housing definitions and classifications; housing typologies-detached, semi-detached, row housing, apartments, plotted and group housing; housing condition, occupancy and tenure patterns; rental and ownership housing; green housing, sustainable housing and green rating systems; role of housing in social and economic development.

Housing and community development; family well-being; social security; community participation; neighborhood identity; safety, crime and insecurity; deprivation, social vulnerability and ghettoism; gender-sensitive and elderly housing; inclusive and universal housing; informal housing sector; slums and squatter settlements; resettlement and rehabilitation; disaster rehabilitation housing; self-help, cooperative and incremental housing approaches; affordable housing policies and public–private participation.

Housing economics and finance; housing market concepts and characteristics; housing stock, supply and demand assessment; housing stress and affordability analysis; law of demand and supply in housing market; housing bubble and market behavior; taxation, fiscal policy and housing budget; housing finance systems and agencies; formal and informal financing mechanisms; role of housing sector in GDP, employment generation and national economy; forward and backward linkages of housing sector.

Housing in urban and regional planning; housing as a land use component in master plans; housing studies and surveys; population projection and household estimation; land suitability analysis for housing; housing requirement estimation and shortage calculation; housing allocation and spatial distribution; land management and land supply regulations; development control regulations; housing policies, planning standards and implementation mechanisms; case studies of national and international housing programs.

Neighborhood and habitat planning; traditional and contemporary neighborhood concepts; cluster, block and neighborhood structure; planning principles for livable and safe communities; density concepts-net and gross density; planning and design criteria for residential layouts; area standards and space standards; community facilities and infrastructure norms; building bye-laws, UDPFI and NBC provisions; high-rise housing-problems and prospects; sustainable neighborhood and habitat planning; case studies of housing and community planning projects.

Learning Resources & References:

1. Baken, R. J., & van der Linden, J. (1993). Land delivery for low-income groups in third world cities. Ashgate Publishing.
2. Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2010). Public places, urban spaces: The dimensions of urban design (2nd ed.). Routledge.
3. Hall, P., & Tewdwr-Jones, M. (2019). Urban and regional planning (6th ed.). Routledge.
4. Kundu, A. (2003). Urbanisation and urban governance: Search for a perspective beyond neo-liberalism. Economic and Political Weekly.
5. UN-Habitat. (2015). Housing at the centre of the new urban agenda. United Nations Human Settlements Programme.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain housing concepts, typologies, policies and their role in social and economic development.		2	1
CO2	Analyze housing demand, supply, affordability and housing market characteristics using planning parameters.		3	
CO3	Evaluate community development issues including social vulnerability, inclusiveness and informal housing conditions.	2		1
CO4	Apply planning standards, regulations and neighborhood planning principles in housing and habitat development.		2	
CO5	Prepare housing and community planning proposals integrating sustainability, affordability and infrastructure standards.	1	2	2

Course Code	**:**	AR756
Course Title	:	**TRANSPORTATION PLANNING**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand land use–transport interaction, urban structure, and travel patterns.
CLO2	To develop skills in transportation surveys, data collection, and analysis.
CLO3	To apply travel demand estimation and modelling techniques.
CLO4	To analyze network assignment, route choice, and mode split behaviour.
CLO5	To evaluate environmental and sustainability aspects in transportation planning.

Course Content

Introduction to urban structure, land use patterns, and transport interaction; relationship between urban form and travel behaviour; classification of transport networks and travel characteristics; overview of land use–transport models and location analysis approaches.

Understanding transportation planning process including problem identification, goals, objectives, and constraints; study area delineation, zoning, and survey methods; data collection techniques, sampling methods, and analysis for transport planning applications.

Study of travel demand modelling including trip generation, distribution, and influencing factors; application of transport-specific modelling approaches including gravity and activity-based models.

Introduction to network analysis including route choice, shortest path, and trip assignment methods; concepts of mode split, competing modes, and probabilistic approaches; evaluation of transport networks, activity-based simulation models using real-time big data for forecasting and mobility management.

Understanding transport and environment including pollution, emissions, and noise; assessment of safety, mobility, and risk factors; overview of sustainable transport strategies including alternative energy and transit-oriented development.

Learning Resources & References:

1. Dickey, J. W. (2017). Metropolitan transportation planning. CRC Press.
2. Hutchinson, B. G. (1974). Principles of urban transportation system planning. McGraw Hill.
3. Kadiyali, L. R. (1999). Traffic engineering and transport planning. Khanna Publishers.
4. Meyer, M. D., & Miller, E. J. (2001). Urban transportation planning. McGraw Hill.
5. Papacostas, C. S., & Prevedouros, P. D. (2015). Transportation engineering and planning (3rd ed.). Pearson India.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain land use–transport relationships and urban travel patterns.		2	1
CO2	Design and conduct transportation surveys and interpret data.	2		2
CO3	Apply travel demand models including trip generation and distribution.	1	2	
CO4	Perform network analysis including assignment and mode split evaluation.	2		2
CO5	Assess environmental impacts and propose sustainable transport strategies.	3	2	2

Course Code	**:**	AR758
Course Title	:	**INFRASTRUCTURE PLANNING**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand sustainable development, infrastructure systems, governance frameworks, and planning standards.
CLO2	To examine integrated infrastructure planning, climate resilience, vulnerability assessment, and risk-sensitive planning approaches.
CLO3	To analyze utility infrastructure systems including water, energy, sanitation, communication, and environmental services.
CLO4	To evaluate urban services, infrastructure performance, environmental quality, and resilience assessment methods.
CLO5	To develop sustainable and implementation-oriented infrastructure planning strategies for urban and regional systems.

Course Content

Introduction to sustainable infrastructure planning; SDGs, climate-responsive development, infrastructure ecology, integrated physical, social, economic, ecological and utility systems; URDPFI, RADPFI, ISO standards, governance frameworks, institutional mechanisms, and stakeholder participation in sustainable infrastructure development.

Infrastructure planning systems; demand–supply assessment, accessibility, facility location, service hierarchy, infrastructure finance, PPP models, land management, regulations, resilience planning, Climate Change Risk Assessment (CCRA), vulnerability assessment, situational analysis, and risk-sensitive infrastructure planning approaches.

Utility infrastructure systems; power generation, renewable energy, ICT and smart utilities, IoT systems, water sourcing, treatment, storage, distribution, rainwater harvesting, water recycling, groundwater recharge, sewerage, sanitation, wastewater treatment, DEWATS, and stormwater management systems.

Urban environmental infrastructure and public services; Sponge City concept, WSUD, flood management, municipal solid waste management, recycling, waste-to-energy systems, emergency infrastructure, firefighting, disaster management, safety systems, and blue-green-grey resilient infrastructure integration.

Infrastructure assessment and performance evaluation; level of service analysis, infrastructure quality indicators, benchmarking, carrying capacity, environmental performance evaluation, infrastructure prioritization, GIS-based analysis, service efficiency assessment, monitoring frameworks, and Indian and global case studies.

Learning Resources & References:

1. Government of India -73rd and 74th Constitutional Amendments, Rights and Planning Acts and guidelines for infrastructure (URDPFI and RADPFI)
2. Lynch, K. (1984). Good city form. MIT Press.
3. Shukla, V. K., Maheshwari, P., Sharma, P., & Vyas, S. (2023). Computational Intelligence in Urban Infrastructure. CRC Press.
4. UN-Habitat. (2015). International guidelines on urban and territorial planning. UN-Habitat.
5. United Nations. (2015). Transforming Our World: The 2030 Agenda for Sustainable Development. United Nations, New York.

. Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain sustainable infrastructure development, infrastructure systems, standards, and governance frameworks.	2	2	1
CO2	Analyze infrastructure resilience, vulnerability, climate risk, and planning assessment approaches.	3	2	3
CO3	Evaluate utility infrastructure systems including water, energy, sanitation, and ICT networks.	2	3	3
CO4	Assess environmental infrastructu re, public services, and infrastructure performance indicators.	2	2	3
CO5	Prepare sustainable and implementation-oriented infrastructure planning and management strategies.	2	3	2

Course Code	**:**	AR760
Course Title	:	**PLANNING STUDIO - II**
Type of Course	:	Program Core
Prerequisites	:	-
Course Delivery Structure	:	0-0-6-6
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand urban and regional planning principles, spatial structure, and regional development frameworks through planning exercises.
CLO2	To apply zoning regulations, planning standards, and infrastructure planning approaches in zonal land use proposals.
CLO3	To develop planning strategies for Special Economic Zones, industrial corridors, and economic development regions.
CLO4	To analyze spatial, socio-economic, and environmental data using GIS and planning techniques for regional planning studies.
CLO5	To prepare integrated urban and regional planning proposals addressing land use, mobility, infrastructure, and environment.

Course Content

The studio introduces urban and regional planning approaches through spatial analysis, settlement hierarchy studies, regional development assessment, and preparation of urban structure frameworks. Exercises focus on regional growth patterns, resource distribution, connectivity systems, and spatial planning strategies for balanced development.

The studio emphasizes zonal land use planning through preparation of land use zoning proposals, development control frameworks, circulation systems, infrastructure networks, and environmental management strategies. Students shall undertake mapping, data analysis, and preparation of planning proposals based on statutory planning norms.

The studio focuses on the planning and development of Special Economic Zones (SEZs), industrial corridors, logistics hubs, and investment regions through projects involving economic base studies, infrastructure planning, mobility systems, environmental assessments, and economic development strategies.

The studio enables students to prepare integrated urban and regional planning proposals through field surveys, stakeholder consultations, GIS-based spatial analysis, and preparation of master plans and zonal development plans. Exercises shall strengthen analytical, technical, and policy-oriented planning skills.

The studio culminates in comprehensive planning projects integrating urban growth management, regional infrastructure systems, economic development strategies, land suitability analysis, environmental planning, and implementation frameworks. The tasks are intended to achieve competency in planning decision-making, spatial visualization, and professional planning practice aligned with the Course Outcomes.

Learning Resources & References:

1. *Gallion, A. B., & Eisner, S. (1986).* The Urban Pattern: City Planning and Design. *Van Nostrand Reinhold.*
2. Geddes, P. (1915). Cities in Evolution. Williams & Norgate.
3. Gehl, J. (2011). Life Between Buildings: Using Public Space (6th ed.). Island Press.
4. Mumford, L. (1961). The City in History: Its Origins, Its Transformations, and Its Prospects. Harcourt Brace & World.
5. United Nations Human Settlements Programme (UN-Habitat). (2020). World Cities Report 2020

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain urban and regional planning concepts, settlement hierarchy, and regional growth patterns.	3	2	2
CO2	Prepare zonal land use and infrastructure planning proposals based on planning norms and regulations.	3	3	3
CO3	Develop planning frameworks for SEZs, industrial regions, and economic development projects.	3	3	3
CO4	Apply GIS, field surveys, and spatial analysis techniques in urban and regional planning studies.	2	3	2
CO5	Produce comprehensive planning proposals integrating land use, transport, infrastructure, and environmental strategies.	3	3	3

PROGRAM ELECTIVE

Course Code	**:**	AR761
Course Title	:	**BIG DATA ANALYTICS FOR PLANNING**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	1-0-3-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Utilize GIS tools to map and analyze large spatial datasets effectively.
CLO2	Apply advanced geo-spatial analysis techniques to identify urban and regional patterns.
CLO3	Understand and evaluate the concepts and applications of Big Data in planning.
CLO4	Integrate Geoinformatics, IoT, and Big Data concepts for urban and regional planning.
CLO5	Develop 3D spatial representations and analyzes for real-world planning scenarios.

Course Content

GIS & 3D Mapping Techniques: Introduction to coordinate systems, projections, and spatial data models; use of geo-processing tools and mapping techniques including platforms such as Google Earth Engine for large-scale geospatial data processing; raster and vector data analysis; handling multi-platform data including conversion of GIS data to CAD and vice versa; 3D mapping techniques in ArcScene for visualization and urban modelling.

Spatial Analysis and Mapping Techniques: Location analysis including suitability, vulnerability, and hotspot analysis; application of spatial tools such as the Near tool and shadow analysis; pattern detection using supervised and unsupervised classification; review and application of spatial indices; digital change detection and its relevance in urban and regional planning. Integration of geospatial tools with Big Data platforms such as Google Earth Engine for processing, analysing, and visualizing large spatial datasets and time-series data relevant to urban and regional planning.

Introduction to basic data handling. Big Data Concepts: Evolution of Big Data and cloud platforms; introduction to Internet of Things (IoT) and its relevance in urban planning; types and characteristics of Big Data; applications of Big Data in urban metabolism, planning, and policy-making. Preprocessing techniques for large datasets. data cleaning and structuring. Overview of the tools and platforms for Big Data analysis in planning applications. Understanding data integration from multiple sources (spatial and non-spatial) for comprehensive urban analysis.

Urban Sensing and Real-Time Analytics: Context and availability of urban sensing datasets; monitoring land use, mobility patterns, and urban activities using real-time data; use of mobile phone network data, event-driven data, and other digital footprints for urban sensing; applications in monitoring urban dynamics, mobility, and environmental patterns.

Case Studies and Applications: Review of global and national case studies using Big Data and geoinformatics; examples include sensing urban problems, deciphering urban mobility, and evaluating urban activities; lessons for integrating Big Data and GIS tools in planning; hands-on approaches for mapping, analysis, and visualization using advanced geospatial techniques.

Learning Resources & References:

1. Ferrari, E., & Rae, A. (2019). GIS for planning and the built environment: An introduction to spatial analysis. Bloomsbury Academic.
2. Masser, I. (Ed.). (2020). Geographic information systems to spatial data infrastructures: A global perspective. CRC Press.
3. Stimmel, L. (2016). Building smart cities: Analytics, ICT, and design thinking. CRC Press.
4. Thakuriah, P. V., Tilahun, N., & Zellner, M. (Eds.). (2016). Seeing cities through big data: Research, methods and applications in urban informatics. Springer.
5. Townsend, A. M. (2014). Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia. W. W. Norton & Company.

Course Outcomes (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explore and apply the applicability of Big Data and cloud-based geospatial platforms in spatial and urban planning.	3	1	3
CO2	Perform different spatial analyzes including suitability, hotspot, and change detection.	3	3	3
CO3	Identify, access, and use Big Data sources for evaluating urban issues and dynamics.	3	2	3
CO4	Carry out data conversion between GIS and CAD platforms to facilitate multi-platform planning workflows.	3	1	3
CO5	Prepare and visualize 3D maps for planning and decision-making applications.	3	3	3

Course Code	**:**	AR762
Course Title	:	**Disaster Management and Resilient Urban Planning**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand key concepts of disasters and disaster management, including hazard, vulnerability, risk, and capacity in the context of urban systems.
CLO2	Examine disaster risk reduction frameworks and governance mechanisms, including global frameworks like the Sendai Framework for Disaster Risk Reduction and their application in resilient city planning.
CLO3	Analyze pre-disaster and post-disaster management strategies, including preparedness, mitigation, response, recovery, and reconstruction.
CLO4	Evaluate the role of stakeholders, community resilience, and decentralized governance in building disaster-resilient cities.
CLO5	Develop spatial planning approaches incorporating vulnerability assessment, risk analysis, and disaster management planning tools for resilient urban development.

Course Content

Introduction to Disasters & Disaster Management Disasters: Concept and definition of disasters; Hazard; Vulnerability: Risk; Capacity; Disaster management: Scope, Definition, Objectives, Elements, Terms, Phases; Recent Initiatives at international, national and state levels; Types, trends, causes and consequences of disasters - Natural disasters, Surficial Processes, Atmospheric processes, Manmade disasters; Climate change impacts and urban disasters.

Disaster Risk Reduction International disaster governance: Theory and practice from Hyogo to Sendai; Integrating the four research communities: Disasters, Development, Climate change and Poverty alleviation; Social capital; Adaptation and Socio- political transformation; Human security; Community resilience and Decentralized disaster governance.

Pre-Disaster Management Measures Preparedness: The nature of preparedness; Problem areas in preparedness; Summary of preparedness needs; Maintenance of preparedness levels; Early warning aspects; Precautionary measures prior to disaster impact; Resources relevant to preparedness arrangements; Components of prevention and mitigation.

Post-Disaster Management Measures Response: Essential Components; Stakeholders' co-ordination; Human Behaviour and response management; Relief measures; Recovery: Reconstruction and rehabilitation as means of development; Damage assessment;

Nature of damage to houses and infrastructure due to disasters; Development of physical and economic infrastructure; Disaster resistant house construction.

Disaster Management Plan Components of disaster management plan: Vulnerability assessment and risk analysis; Preventive measures and mitigation plan; Preparedness measures; Response plan; Recovery plan; Exemplary Case Studies.

Learning Resources & References:

1. Lindell, M. (Ed.). (2019). The Routledge handbook of urban disaster resilience: Integrating mitigation, preparedness, and recovery planning. Routledge.
2. Paton, D., & Johnston, D. (2017). Disaster resilience: an integrated approach. Charles C Thomas Publisher.
3. Paul, B. K. (2011). Environmental hazards and disasters: Contexts, perspectives and management. John Wiley & Sons.
4. Penna, A. N., & Rivers, J. S. (2013). Natural disasters in a global environment. Wiley-Blackwell.
5. Sharma, V. R. (Ed.). (2019). Making cities resilient. Springer.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Apply disaster management concepts and frameworks to urban and regional planning contexts with a focus on resilience.	3	3	2
CO2	Analyze disaster risks using vulnerability mapping, risk assessment techniques, and spatial planning tools.	3	2	2
CO3	Design comprehensive Disaster Management Plans incorporating mitigation, preparedness, response, and recovery strategies.	3	2	3
CO4	Evaluate the effectiveness of governance systems, stakeholder coordination, and community participation in disaster risk reduction and resilient city development.	3	3	3
CO5	Propose planning and design interventions for disaster-resilient cities, including resilient infrastructure, housing, and climate-adaptive urban systems.	3	3	3

Course Code	**:**	AR763
Course Title	:	**ENVIRONMENT AND SUSTAINABLE BEHAVIOR IN PLANNING**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To develop an understanding of environmental psychology principles related to sustainable behaviour, perception, cognition, and attitudes.
CLO2	To examine theories of environment behaviour relationships and their relevance in shaping human interaction with the physical environment.
CLO3	To analyze environmental awareness, responsibility, and decision-making processes including collective action and communication.
CLO4	To understand behaviour, change models, pro-environmental strategies, and intervention approaches for sustainability.
CLO5	To integrate environmental psychology with physical planning concepts aligned with the UN framework and Sustainable Development.

Course Content

Overview to environmental psychology of sustainable behavior. Environmental Perception and cognition environmental attitudes and behavior. Environmental awareness, environmental concern, environmental responsibility, Environmental commitment environmental assessment.

Ecological world views, Global values, Ecological self. environmentally relevant behavior and attitudes, applied behavior analysis, Theory of planned behavior, commons dilemma, collective decision environmental communication.

Introduction to the theories of Environment-Behavior relationships. The nature and function of theories. Gerald Weisman, key concepts of the relationship between human behavior and the physical environment. Arousal approach, stimulation approach, Adaptation level, Brunswick's Lens model, Warren and Warren's Neighborhood types, Brunswick's Lens model, James J Gibson's ecological approach to visual perception.

Changes in the Human Physical environment and the ecological revolution, psychology of interdependence, challenge of increasing Pro- Environmental and Behavior, lack of environmental impact, the DO IT Process, Three stages of behavior, three basic interventions. Behavior change model with intervention approaches.

Overview of UN mandate for sustainable development. Physical Planning Process. Challenges in Physical Planning Process. Theories by C. West Churchman & Morris Ginsberg, and Aaron Wildavsky. Planning for people's lives. Population, culture, lifestyle, demographics assessment as the context variables. Density, Perceived Density and Crowding. Quality of Life. Building types as response to the socio-cultural-demographic

needs. Types of open spaces, streets. Concepts & concerns of Environmental Psychology and Urban Planning. Challenges in integration.

Learning Resources & References:

1. Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211.
2. Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2010). Public places, urban spaces: The dimensions of urban design (2nd ed.). Oxford: Architectural Press.
3. Gifford, R. (2014). Environmental psychology: Principles and practice (5th ed.). Colville, WA: Optimal Books.
4. Steg, L., van den Berg, A. E., & de Groot, J. I. M. (Eds.). (2019). Environmental psychology: An introduction (2nd ed.). Hoboken, NJ: Wiley-Blackwell.
5. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. New York, NY: United Nations.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Ability to explain key concepts of environmental perception, cognition, attitudes, and behaviour in real-world contexts.	1	-	2
CO2	Enable to apply environment behaviour theories (e.g., arousal, adaptation, ecological approaches) in planning and design situations.	1	3	3
CO3	Enhance capacity to evaluate environmental behaviour using frameworks like the Theory of Planned Behaviour and commons dilemma.	-	2	2
CO4	Develop skills to propose behaviour change strategies and interventions for promoting sustainable and pro-environmental actions.	3	1	1
CO5	Build capacity to synthesize environmental psychology and urban planning principles to design human-centered, sustainable environments considering population, density, culture, and quality of life.	2	3	1

Course Code	**:**	AR764
Course Title	:	**Environmental Impact Assessment and Evaluation**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To provide a comprehensive understanding of the EIA framework, legal requirements, and the evolution of environmental policy.
CLO2	To train students in various assessment methodologies, including screening, scoping, and the prediction of impacts on air, water, land, and biological environments.
CLO3	To develop the ability to design Environmental Management Plans (EMP) that incorporate effective mitigation measures and monitoring protocols.
CLO4	To emphasize the importance of public participation, social impact assessment, and ethical considerations in the decision-making process.
CLO5	To evaluate the trade-offs between economic development and ecological integrity.

Course Content

Concept of environmental impact, Introduction to Environmental Impact Assessment (EIA) - definitions, terminology, and concepts, Evolution of EIA in the USA, Key features of the National Environmental Policy Act and its implementation, Role of the USEPA,

Evolution of EIA in India, Sustainable development, Generalised EIA process flow chart, Screening, Initial environmental examination (IEE), Scoping, Public participation. Environmental Risk assessment, Pollution prevention and Waste minimization, sustainable development (SD), Life cycle assessment. Global Environmental Issues.

EIA - Screening and scoping criteria, Rapid and comprehensive EIA, Impact assessment methods, checklists, matrices, quantitative methods, networks, overlay mapping, Impact prediction and evaluation, Legislative and environmental clearance procedures in India and other countries, Siting criteria, CRZ, Public participation, Resettlement and rehabilitation.

Practical applications of EIA, EIA methodologies, Baseline data collection, Prediction and assessment of impacts on physical, biological and socio-economic environment,

Environmental management plan, Post project monitoring, initial environmental examination (IEE), environmental impact statement (EIS), environmental appraisal, environmental audit (EA), Environmental impact factors and areas of consideration, measurement of environmental impact, organisation, scope and methodologies of EIA, case studies stressing physical aspects of environment, Evolution of EIA, EIA at project, Regional and policy levels, Strategic EIA, EIA process.

Learning Resources & References:

1. Environmental Impact Assessment (2nd ed.). New York, NY: McGraw-Hill Education.
2. Glasson, J., Therivel, R., & Chadwick, A. (2013). Introduction to Environmental Impact Assessment (4th ed.). London: Routledge.
3. Modak, P., & Biswas, A. K. (1999). Conducting Environmental Impact Assessment in Developing Countries. Tokyo: United Nations University Press.
4. Morris, P., & Therivel, R. (Eds.). (2009). Methods of Environmental Impact Assessment (3rd ed.). London: Routledge.
5. United Nations Environment Programme (UNEP). (2019). Global Environment Outlook – GEO-6: Healthy Planet, Healthy People. Cambridge: Cambridge University Press.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	To determine if a project requires an EIA and identify the key environmental issues that need detailed study.	1	-	2
CO2	To utilize matrices and modeling software to predict the magnitude and significance of potential environmental changes.	-	2	2
CO3	To design actionable Environmental Management Plans (EMP) to avoid, minimize, or compensate for adverse impacts.	-	3	3
CO4	To review Environmental Impact Statements for technical accuracy, compliance, and adequacy.	1	2	3
CO5	To balance the interests of various stakeholders while upholding environmental ethics and social justice.	-	-	3

Course Code	**:**	AR765
Course Title	:	**Environmental Performance of Urban Systems**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand the principles, objectives, and significance of landscape planning in sustainable development.
CLO2	Analyze physical, ecological, and socio-economic characteristics of sites for landscape planning.
CLO3	Apply mapping, GIS, and spatial analysis tools to assess landscapes and plan interventions.
CLO4	Develop design and management strategies for functional, aesthetic, and resilient landscapes.
CLO5	Evaluate policies, governance mechanisms, and case studies to inform best practices in landscape planning.

Course Content

Introduction to urban environmental performance concepts, principles, and scope; relationships between buildings, neighbourhoods, and urban systems; sustainability, resilience, liveability indicators and frameworks.

Overview of environmental performance indicators including thermal comfort, visual environment, air quality, acoustics, and energy; role of architects and planners in decision-making.

Field measurement techniques for environmental parameters including temperature, humidity, wind, solar radiation, daylight, and noise; use of instruments, sensors, and surveys.

Environmental data collection methods, user perception studies, data recording, validation, analysis; application of field-based studies for real-time performance assessment of urban spaces.

Urban microclimate understanding, heat island effects, street canyon dynamics, shading patterns; outdoor thermal comfort, environmental quality, land use, mobility, and planning interventions.

Learning Resources & References:

1. Anjaneyulu Y. , Environmental impact assessment methodologies (2008), B.S. Publications
2. Canter L. (1995), Environmental Impact Assessment, McGraw Hill.
3. Santamouris, M. (Ed.). (2013). Energy and climate in the urban built environment. Routledge.
4. Sayre D., Inside ISO 14000: Competitive Advantage of Environmental Management, St. Louis Press, Florida.
5. World Bank Environmental Assessment Source Book (1996) , Environment Dept., Washington D.C.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Interpret the physical, ecological, and socio-economic attributes of landscapes for planning purposes.	2	1	-
CO2	Assess landscape resources, environmental constraints, and opportunities for sustainable design.	2	2	1
CO3	Apply spatial analysis, mapping, and visualization tools in landscape planning projects.	3	2	-
CO4	Prepare landscape planning and design proposals for urban, rural, and special areas.	3	2	2
CO5	Evaluate policy frameworks, governance structures, and stakeholder roles in implementing landscape plans.	2	3	3

Course Code	**:**	AR766
Course Title	:	**Environmental Planning**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand environmental and ecological system in relation to urban and regional development.
CLO2	To examine environmental resources, environmental degradation, pollution, and climate-related challenges influencing planning decisions.
CLO3	To analyze environmental planning tools, resource assessment methods, environmental policies, and regulatory frameworks.
CLO4	To develop environmentally sensitive strategies integrating sustainability, resource management, and environmental impact considerations.
CLO5	To evaluate environmental planning approaches for sustainable settlement development, ecological conservation, and climate-responsive planning.

Course Content

Introduction to environmental planning; aims, objectives and scope of environmental planning in urban and regional development; concepts and components of environment; types of environments and ecological systems; environmental planning process, interventions and implementation approaches; environmental degradation, pollution and ecological imbalance; population as an environmental resource; low-carbon development strategies and sustainable planning approaches; environmental impacts of planning and development activities.

Natural resources and environmental systems; scarcity and exploitation of natural resources; ecosystem services, planning approaches for optimizing resource utilization; water harvesting, wasteland management and carbon management techniques; air environment and associated environmental issues including pollution, global warming, climate change and ozone depletion; water resources, sanitation and water resource renewal systems; soil environment, soil types, soil pollution and land degradation; evaluation of energy resources including renewable, non-renewable, conventional and non-conventional energy systems.

Environmental resources assessment and planning tools; environmental resource mapping, inventories and matrices; resource regions in India and their environmental potentials and challenges; integrated resource planning approaches; environmental sustainability principles and environmental criteria for locating human settlements; ecological parameters and environmental suitability analysis for site planning, settlement planning and regional planning; GIS and spatial analysis applications in environmental planning.

Environmental planning methods and management approaches; environmental impact assessment and environmental statements; integration of environmental assessment with planning options and development proposals; environmental quality standards and environmental indicators; planning strategies for minimizing environmental impacts and improving ecological quality; environmental management systems and sustainable urban infrastructure approaches; disaster resilience and climate-responsive planning strategies.

Environmental governance and policy frameworks; global environmental concerns, biodiversity conservation and ecosystem management; environmental policies, protocols and regulatory mechanisms; overview of environmental acts and legislation; Rio Earth Summit, Stockholm Conference and Kyoto Protocol; Government of India environmental policies and planning frameworks; case studies of environmental planning and sustainable development initiatives at national and international levels.

Learning Resources & References:

1. Cunningham, W. P., & Cunningham, M. A. (2018). Environmental Science: A Global Concern (15th ed.). McGraw Hill Education.
2. Intergovernmental Panel on Climate Change (IPCC). (2023). Climate Change 2023: Synthesis Report. Geneva: IPCC.
3. Khanna, D. D. (1997). Sustainable Development: Environmental Security, Disarmament, and Development Interface in South Asia. Macmillan India.
4. Miller, G. T., & Spoolman, S. (2016). Environmental Science (15th ed.). Cengage
5. United Nations Human Settlements Programme (UN-Habitat). (2020). World Cities Report 2020: The Value of Sustainable Urbanization. Nairobi: UN-Habitat.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain environmental systems, resources and planning principles in development contexts.	2	1	2
CO2	Analyze environmental degradation, pollution and climate-related planning challenges.	3	2	2
CO3	Evaluate environmental resources, ecological parameters and planning assessment methods.	3	3	2
CO4	Apply environmentally sensitive planning strategies integrating sustainability and impact management.	2	3	3
CO5	Prepare sustainable environmental planning approaches for settlements and regional systems.	2	3	3

Course Code	**:**	AR767
Course Title	:	**LAND MARKET AND REAL ESTATE MANAGEMENT**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To develop a comprehensive understanding of economic principles of land use, including rent theory, land demand–supply dynamics, and market structures.
CLO2	To analyze land policy instruments and regulatory frameworks, including planning, fiscal, financial, and institutional mechanisms, and their impacts on land markets and access.
CLO3	To examine property rights systems and land development processes, including ownership patterns, land assembly techniques, PPPs, and land management tools.
CLO4	To evaluate land market behaviour and valuation techniques, including pricing methods, real estate cycles, risk, and forecasting approaches.
CLO5	To understand governance, transparency, and ethical issues in land markets, including corruption, land information systems, and regulatory reforms.

Course Content

Land use is shaped by rent, demand–supply, and market forces. Demand depends on population, income, and growth, while supply is limited and policy-driven. Markets exist in formal/informal and legal/illegal forms. Government tools influence pricing, access, and equity.

Property rights (ownership, use, exchange) affect land supply and efficiency. Development occurs through sale, lease, and PPPs with varying costs and methods. Corruption and speculation distort markets and raise prices. Planning tools like zoning and master plans regulate distribution and social justice.

Techniques include land pooling, TDR, land sharing, cooperatives, and FDI. These improve land assembly and planned development. Policy instruments-planning, fiscal, and financial-guide market behavior. They balance public control with private participation.

Land demand is driven by income elasticity, growth, and business cycles. Externalities, infrastructure, and mega projects create induced demand. Lifestyle changes and affordability influence land use patterns. Incentives help regulate or promote land demand.

Land valuation uses pricing methods like auctions and hedonic models. Markets show cycles, risks, and issues like cartelization and speculation. Regulations such as Real Estate (Regulation and Development) Act, 2016 improve transparency. Land Information Systems enable better records, monitoring, and informed decisions.

Learning Resources & References:

1. Alonso, W. (1964). Location and Land Use: Toward a General Theory of Land Rent. Harvard University Press.
2. Brueggeman, W. B., & Fisher, J. D. (latest ed.). Real Estate Finance and Investments. McGraw-Hill Education.
3. Dowall, D. E. (1991). The Land Market Assessment: A New Tool for Urban Management. World Bank.
4. UN-Habitat. (2015). International Guidelines on Urban and Territorial Planning. United Nations, Nairobi.
5. World Bank. (2013). Planning, Connecting, and Financing Cities-Now. World Bank Publications.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Apply concepts of rent, demand–supply dynamics, income elasticity, and business cycles to analyze land use patterns and demand forecasting.	3	3	3
CO2	Analyze formal/informal market conditions, and evaluate the impact of planning, fiscal, financial, and regulatory instruments on land supply, pricing, and accessibility.	3	3	3
CO3	Evaluate implications of property rights systems and compare land development techniques such as land pooling, TDR, PPP, and cooperative approaches.	3	3	3
CO4	Apply land valuation methods and analyze real estate cycles, risks, and market behavior in urban contexts.	3	3	3
CO5	Assess issues of corruption, transparency, and regulation, and evaluate the role of Land Information Systems and policy reforms in improving land market efficiency and equity.	3	3	3

Course Code	**:**	AR768
Course Title	:	**LANDSCAPE PLANNING**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand concepts, principles, and scope of urban environmental performance across building and urban systems
CLO2	To identify and interpret environmental performance indicators related to comfort, quality, and energy
CLO3	To develop skills in field measurement techniques and environmental data collection methods
CLO4	To analyze environmental data and assess performance of urban spaces using field-based approaches
CLO5	To evaluate urban microclimate conditions and propose performance-based planning and design strategies

Course Content

Introduction to Landscape Planning: Concepts, principles, and objectives of landscape planning; importance of landscapes in ecological balance, urban-rural integration, and socio-cultural identity; historical evolution and contemporary approaches blue-green networks, sponge city concepts, and climate-responsive planning to landscape planning; roles of planners, architects, ecologists, and communities in shaping landscapes.

Physical, Ecological, and Socio-Economic Attributes: Analysis of physical, geographical, and ecological characteristics of landscapes; assessment of soil, water, vegetation, and topography; understanding socio-economic, cultural, and demographic attributes; role of urban forestry, identification of natural and human-induced constraints in landscape development.

Planning Tools, Techniques, and Assessment Methods: Surveying and mapping techniques including GIS, remote sensing, and participatory mapping; tools for spatial analysis and visualization; landscape assessment frameworks for biodiversity, aesthetics, and ecological services; assessment of blue-green infrastructure networks, urban hydrology, scenario modeling for alternative planning strategies; ecosystem-based planning methods.

Landscape Design and Implementation Strategies: Planning and design of urban green spaces, parks, streetscapes, waterfronts, and recreational areas; principles of urban park planning, open space systems, and open space management, restoration and conservation of natural landscapes; integration of infrastructure, accessibility, and connectivity; sustainable design approaches incorporating renewable energy, water management, and climate resilience.

Policy, Governance, and Case Studies: Landscape-related policies, regulations, and guidelines at local, regional, and national levels; governance frameworks for urban forestry, open space planning, and blue-green infrastructure; stakeholder engagement, public-private partnerships, and community participation; evaluation of exemplary landscape planning projects; monitoring and management of landscapes for long-term sustainability; landscape planning for heritage sites, tourism areas, and special economic zones.

Learning Resources & References:

1. Bell, S. (2012). Landscape: Pattern, Perception and Process. Routledge.
2. Forman, R. T. T. (1995). Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press.
3. McHarg, I. L. (1969). Design with Nature. Doubleday.
4. Steiner, F. R. (2011). Landscape Planning: A Systems Approach. Island Press.
5. UN-Habitat. (2020). Nature-Based Solutions for Urban Sustainability. United Nations Human Settlements Programme.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain urban environmental performance concepts and their relevance to sustainability, resilience, and liveability	2	2	3
CO2	Interpret environmental indicators including thermal, visual, acoustic, air quality, and energy performance.	3	2	2
CO3	Conduct field measurements and collect environmental data using appropriate tools and techniques	2	3	3
CO4	Analyze and evaluate environmental data to assess performance of buildings and urban environments	3	2	2
CO5	Apply microclimate understanding to develop planning and design interventions for improved environmental performance	2	3	3

Course Code	**:**	AR769
Course Title	:	**NATURAL RESOURCE MANAGEMENT**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand the meaning, concepts, and classification of natural resources and methods of resource appraisal.
CLO2	To explain the approaches to natural resource management, including utilization, conservation, and management strategies.
CLO3	To examine the issues and challenges associated with land, soil, water, forest, and energy resources.
CLO4	To explore sustainable resource development, including alternate energy resources and conservation practices.
CLO5	To analyze natural resource governance frameworks and policies.

Course Content

Natural resources form the foundation of human survival and development. This course begins with an understanding of the meaning, concepts, and classification of natural resources, along with techniques for resource appraisal to assess their availability, quality, and potential use.

Explores different approaches to natural resource management, focusing on efficient utilization and long-term sustainability. Emphasis is placed on balancing human needs with ecological limits through appropriate management strategies.

The course examines key issues and challenges associated with the use of natural resources, including degradation, overexploitation, and inequitable access. It also highlights methods for conservation and sustainable management of land, soil, water, and forest resources.

With increasing global demand for energy, the course addresses growing energy needs and promotes the use of alternative and renewable energy resources. It also discusses strategies for energy conservation and efficient resource use.

The course focuses on sustainable resource development, supported by governance frameworks and policy instruments. It emphasizes the role of institutions, regulations, and policies in ensuring responsible management and long-term sustainability of natural resources.

Learning Resources & References:

1. Dash, M. C. (2013). Concepts of environmental management for sustainable development. I. K. International Publishing House Pvt. Ltd.
2. Lynch, D. R. (2009). Sustainable natural resource management: For scientists and engineers. Cambridge University Press.
3. Potter, K. (2022). Natural resources exploitation, depletion and conservation. Callisto
4. Rogers, P., Jalal, K. F., & Boyd, J. A. (2007). An introduction to sustainable development. Routledge.
5. Shivakoti, G., Pradhan, U., & Helmi, H. (Eds.). (2016). Redefining diversity and dynamics of natural resources management in Asia: Sustainable natural resources management in dynamic Asia (Vol. 1). Elsevier.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Comprehend and explain the concepts, classification, and appraisal techniques of natural resources.	2	2	3
CO2	Analyze various approaches to natural resource management, including utilization, conservation, and efficiency strategies.	3	3	3
CO3	Assess the key issues and challenges in managing land, soil, water, forest, and energy resources.	3	3	3
CO4	Apply concepts of sustainability, alternative energy, and conservation in resource development planning.	2	2	2
CO5	Evaluate natural resource governance systems and policies and their effectiveness in achieving sustainable outcomes.	3	3	3

Course Code	**:**	AR770
Course Title	:	**PLANNING FOR SMART CITIES**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand the evolution, concepts, components, and planning frameworks of smart cities in relation to sustainable urban development.
CLO2	To examine smart urban systems, infrastructure services, governance models, and ICT-enabled planning approaches.
CLO3	To analyze smart mobility, smart energy, smart environment, and smart utility systems for efficient urban management.
CLO4	To develop strategies for smart city planning, retrofitting, redevelopment, and integrated urban infrastructure development.
CLO5	To evaluate smart city policies, standards, participatory governance systems, and implementation frameworks in Indian and global contexts.

Course Content

Introduction to cities and urban transformation; evolution of urban settlements, industrial revolution and changing city structures; urbanization trends, opportunities and challenges; sustainable development and urban prosperity; concepts and evolution of smart cities; principles, characteristics and components of smart cities; smart city indicators, standards and performance frameworks; role of governance, innovation and digital transformation in urban planning.

Smart city planning process and policy framework; predictive modelling and data-driven planning; prerequisites and categories of smart cities; integrated planning approaches, citizen participation and collaborative governance; open data systems and urban analytics; institutional frameworks and smart city governance; smart city mission of India; challenges, limitations and ethical concerns in smart city planning and implementation.

Smart infrastructure and urban systems; smart mobility systems, intelligent transport systems and ICT-enabled transportation; smart energy systems, renewable energy integration, smart grids and electric mobility; smart water supply, wastewater and waste management systems; smart environmental monitoring and climate-responsive urban infrastructure; disaster resilience, safety systems and sustainable infrastructure management approaches.

Smart governance, economy and urban services; e-governance, participatory governance and digital public services; smart economy, innovation ecosystems, SMEs and sharing economy; crowd sharing, co-creation and entrepreneurship; smart buildings and intelligent infrastructure systems; urban informatics, IoT applications and ICT architecture

for smart cities; applications of artificial intelligence (AI), GIS, sensors and real-time monitoring technologies in planning and urban management.

Smart city development strategies and implementation frameworks; retrofitting, redevelopment and greenfield development approaches; pan-city smart solutions and area-based development; financing mechanisms, PPP models and investment strategies; monitoring and evaluation frameworks for smart city performance; national and international case studies of smart city planning, governance and infrastructure systems with special reference to Indian smart cities.

Learning Resources & References:

1. Batty, M. (2018). Inventing Future Cities. MIT Press.
2. Bureau of Indian Standards (BIS). (2021). Smart City Assessment Framework for Indian Cities. New Delhi: BIS.
3. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach (4th ed.). Pearson.
4. Stimmel, C. L. (2016). Building Smart Cities: Analytics, ICT, and Design Thinking. CRC Press.
5. United Nations Human Settlements Programme (UN-Habitat). (2022). World Cities Report 2022: Envisaging the Future of Cities. Nairobi: UN-Habitat.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain concepts, components and planning frameworks of smart cities.	2	2	1
CO2	Analyze smart urban systems, ICT infrastructure and governance approaches.	3	2	2
CO3	Evaluate smart mobility, energy, environment and utility infrastructure systems.	2	3	3
CO4	Apply smart city planning strategies including retrofitting and redevelopment approaches.	2	3	3
CO5	Prepare integrated and implementation-oriented smart city development proposals.	3	3	3

Course Code	**:**	AR771
Course Title	:	**PLANNING FOR SPECIAL AREA**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand the concept, evolution, and typology of special areas in planning practice.
CLO2	Analyze the characteristics and development dynamics of special areas and mega projects.
CLO3	Evaluate the relationship between mega projects and urban/regional development systems.
CLO4	Examine governance, legal frameworks, and land management practices in special areas.
CLO5	Assess infrastructure requirements and planning strategies for diverse special area developments.

Course Content

Evolution and Need for Special Area Planning: Evolution and need for special area planning; defining special areas; typology of formal and functional special areas including border areas, hill areas, coastal areas, desert areas, and extremist-affected areas; emerging special areas such as Special Economic Zones (SEZ), port cities, aerotropolis, knowledge cities, heritage areas, and defence areas; contemporary approaches and frameworks for special area planning.

Characteristics and Mega Project Concepts: Socio-economic, physiographic, geographic, and political features of special areas; mega projects- concepts including investment-based and activity-based approaches; mega projects, types and nature such as buildings, transportation, environmental, and irrigation projects; related concepts including SEZs, Free Trade Zones, and their strategic importance; relationship between mega projects and urban development.

Mega Projects and Urban Systems: Mega projects and the Indian urbanization system; trends of urbanization in India in relation to mega projects; national-level guidelines for mega projects; infrastructure requirements for mega projects; integration of mega projects with city infrastructure systems; mega projects vis-à-vis city development; specific infrastructure requirements for different categories of mega projects.

Governance, Legislation, and Planning Framework: Legislation and governance frameworks for special areas; land management practices in special areas; survey of statutes governing special areas; meaning, nature, types, and scale of special areas and projects; role of special areas in urban and regional planning and development; issues,

challenges, resources, and constraints; infrastructure challenges associated with mega special area projects.

Infrastructure Planning and Case Studies: Unique infrastructural needs and planning standards for special areas; capital investment standards, funding mechanisms, and public-private partnerships; infrastructure requirements for contemporary special areas including historic cores, heritage areas, airport regions, ports and terminals, IT parks, theme parks, SEZs, free enterprise zones, dry ports, and free ports; survey of programmes and best practices in special area planning; case studies including preparation of infrastructure inventory for various mega projects; specific infrastructure detailing.

Learning Resources & References:

1. Farole, T., & Akinci, G. (Eds.). (2011). *Special economic zones: progress, emerging challenges, and future directions*. World Bank Publications.
2. Hall, P., & Tewdwr-Jones, M. (2019). *Urban and regional planning*. Routledge.
3. Ministry of Environment and Forests. (2011). *Coastal Regulation Zone (CRZ) notification, 2011*. Government of India.
4. Ministry of Urban Development. (2015). *Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines* (Vols. I & II). GoI.
5. Tantri, M. L. (2016). *Special economic zones in India: Policy, performance and prospects*. Cambridge University Press.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain different types of special areas and their relevance in urban and regional planning.	3	2	2
CO2	Analyze mega projects in terms of concepts, typologies, infrastructure needs, and impacts.	2	3	3
CO3	Evaluate urbanization trends and the integration of mega projects with city systems.	3	2	2
CO4	Assess policy, legal, and governance frameworks related to special area development.	3	2	3
CO5	Prepare infrastructure planning inputs and case-based analysis for special area projects.	3	3	3

Course Code	**:**	AR772
Course Title	:	**REGIONAL PLANNING**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand the physical, geographical, demographic, and economic characteristics of a region and their influence on regional development.
CLO2	Analyze regional settlement patterns, resource distribution, and spatial disparities using appropriate analytical tools.
CLO3	Apply spatial data collection, mapping, and representation techniques for regional analysis.
CLO4	Evaluate regional connectivity, infrastructure systems, and institutional frameworks to identify development issues and potentials.
CLO5	Formulate strategic planning approaches and management frameworks for balanced regional development.

Course Content

Physical and geographical attributes of the region; Regional demographic profile; Regional economic scenario.

Settlement pattern in the region; Special characteristics of the region

Resource mapping; regional diversity in resource endowment; Regional disparity in development

Inter and intra-regional connectivity; Mapping of social, physical and economic infrastructures

Identification of sectoral and spatial development issues; Identification of potential thrust areas and constraints; Understanding the institutional mechanisms and statutory framework; Designing of alternative planning strategies and management plans.

Learning Resources & References:

1. Chand, M., & Puri, V. K. (1983). *Regional planning in India* (Vol. 1). Allied Publishers.
2. Glasson, J., & Marshall, T. (2007). *Regional planning*. Routledge.
3. Kumar, A., Meshram, D. S., & Gowda, K. (Eds.). (2016). *Urban and regional planning education: Learning for India*. Springer Singapore.
4. Mishra, R. S. M., Chatterjee, S., de Lucena, A. J., & Singh, R. B. (2022). *Regional Development Planning and Practice*. Springer Singapore.
5. Nath, V. (2009). *Regional development and planning in India*. Concept Publishing Company.

COURSE OUTCOMES (CO)		Program Outcomes(PO)		
		1	2	3
CO1	Appreciate and critically analyze settlement patterns and regional characteristics in both urban and rural contexts.	3	2	2
CO2	Collect, document, and represent socio-economic, physical, and infrastructural data spatially using mapping and visualization techniques.	2	2	2
CO3	Envision and evaluate the spatio-economic growth trajectory of the region, identifying opportunities and challenges.	2	2	3
CO4	Propose spatial and sectoral interventions at the regional scale to enhance balanced development, considering institutional and statutory frameworks.	3	2	3
CO5	Prepare and present a comprehensive regional development report following prescribed formats and standards.	3	3	3

Course Code	**:**	AR773
Course Title	:	**RESEARCH METHODS AND STATISTICS**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand research philosophies, paradigms, and methodologies relevant to architecture, planning, and built environment studies.
CLO2	To examine literature review methods, research gaps, scholarly communication, and academic writing practices.
CLO3	To analyze qualitative, quantitative, and mixed-method research approaches including sampling, data collection, and experimental methods.
CLO4	To develop research frameworks using behavioural, physical, and spatial research techniques for architecture and planning applications.
CLO5	To evaluate research findings through data analysis, interpretation, academic presentation, and research dissemination methods.

Course Content

Research aims and questions; research philosophy and paradigms in architectural and planning inquiry. Literature search and review; use of libraries, databases, and digital repositories; identification of research gaps; aim and structure of a literature review. Scholarly communication; introduction to academic writing; writing and publishing journal papers; preparation and presentation of conference papers; visual and oral presentation of research.

Analysis of research problems; formulation of hypotheses and variables; principles of research design; sampling strategies; experimental and quasi-experimental approaches; field surveys, observational studies, simulations, and theoretical models; laboratory investigations relevant to building science and urban systems.

Behavioural research: data collection methods including questionnaires, interviews, and structured and unstructured observation; unobtrusive and obtrusive measures; scaling techniques such as Likert and semantic differentials; issues of reliability, validity, and bias.

Physical research: laboratory and field-based measurements; instrumentation and resources; environmental data acquisition related to thermal, acoustic, and air quality parameters.

Data analysis and interpretation; integration of qualitative and quantitative findings; development of coherent research narratives for application in architecture and planning contexts.

Learning Resources & References:

1. Bryman, A. (2016). Social Research Methods (5th ed.). Oxford University Press.
2. Forrester, J. W. (1969). Urban Dynamics. MIT Press
3. Groat, L. N., & Wang, D. (2013). Architectural Research Methods (2nd ed.). John Wiley & Sons.
4. Mitchell, W. J. (1995). City of Bits: Space, Place, and the Infobahn. MIT Press.
5. United Nations Educational, Scientific and Cultural Organization (UNESCO). (2021). Open Science Recommendation. Paris: UNESCO.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain research paradigms and methodologies in built environment studies.	3	1	1
CO2	Conduct literature reviews and identify research gaps using academic resources.	3	2	1
CO3	Develop research designs using qualitative, quantitative and mixed methods.	3	3	2
CO4	Apply behavioural, physical and spatial research techniques for planning and architectural studies.	2	3	3
CO5	Present and interpret research findings through academic writing and professional communication.	2	3	2

Course Code	**:**	AR774
Course Title	:	**RURAL DEVELOPMENT PLANNING AND GOVERNANCE**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand the structure and dynamics of rural society and livelihood systems in India.
CLO2	Analyze the role and importance of natural resources in sustainable rural development.
CLO3	Examine the interlinkages between rural and urban systems and their implications for development planning.
CLO4	Evaluate rural governance structures, institutional mechanisms, and policy frameworks.
CLO5	Assess key issues, challenges, and planning approaches for effective rural development and management.

Course Content

Historical perspective: Rural Development Programmes in India - evolution of rural development thinking; problem identification, perception, and targeting of beneficiaries; rural area planning approaches; major programmes, policies, and schemes for rural development, their coverage, performance, and outcomes. Key initiatives including Bharat Nirman for rural infrastructure; Rural Building Centres; Pradhan Mantri Gram Sadak Yojana; Indira Awaas Yojana; Rajiv Gandhi Technology Mission; Central Rural Sanitation Programme; Provision of Urban Amenities in Rural Area- objectives, implementation mechanisms, and impacts.

Rural livelihood and employment: MGNREGA Act, 2005; Sampoorna Grameen Rozgar Yojana; National Food for Work Programme; Swarna Jayanti Gram Swarozgar Yojana; National Social Assistance Programme; design, coverage, livelihood generation, and socio-economic outcomes. Rural livelihood- socio-economic scenario of rural settlement, skills, non-farm activities, rural-urban linkages; Source of livelihood - land, water, forest, agriculture, and allied sector; Rural settlement pattern - factors, types.

Pre- and post-independence rural policies: Five-Year Plans (FYP) and their rural development focus; natural resource management policies; livelihood enhancement programmes; institutional structure of rural governance including Panchayati Raj Institutions, rural finance systems, and e-governance initiatives. Rural Development Policies and Governance: Pre- and post-independence rural policies; FYP and their rural development focus; natural resource management policies; livelihood enhancement

programmes; institutional structure of rural governance including Panchayati Raj Institutions, rural finance systems, and e-governance initiatives.

Issues in rural development: Agricultural crisis, rural poverty, education, health, employment, infrastructure deficits, drinking water and sanitation; capacity building; peri-urbanization; project implementation challenges; irrigation management; watershed and soil conservation; wetland management; floodplain zoning; water management including rainwater harvesting; integrated energy management with renewable energy; forest resource management; case studies.

Spatial Village Development Plan: Baseline assessment, identification of issues and challenges; data collection methods and analysis; planning approaches including stakeholder participation and participatory rural development; tools and techniques for spatial assessment; preparation of village development plans; programmes (Command Area Programme, Drought Prone Area Programme, Backward Area Development Programme, and North Eastern Development Programme).

Learning Resources & References:

1. Dixon, C. (2015). Rural development in the third world. Routledge.
2. Leigh, N. G. (2024).*Planning local economic development: Theory and practice*. SAGE publications.
3. Mayer, A. (2022).Pilot project, India: the story of rural development at Etawah, Uttar Pradesh. Univ of California Press.
4. Narayanasamy, N. (2009). Participatory rural appraisal: Principles, methods and application. SAGE Publications Ltd.
5. Van Assche, K., & Hornidge, A. K. (2023).Rural development: knowledge and expertise in governance. BRILL.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain the evolution and performance of rural development programmes and policies in India.	2	3	2
CO2	Analyze rural infrastructure and employment schemes in terms of design, implementation, and outcomes.	2	3	3
CO3	Assess rural livelihood patterns, settlement structures, and resource dependencies.	2	2	2
CO4	Evaluate rural governance systems including Panchayati Raj Institutions, finance, and e-governance mechanisms.	3	3	3
CO5	Prepare a basic spatial village development plan using participatory approaches and planning tools.	3	2	3

Course Code	**:**	AR775
Course Title	:	**SPACE PLACE AND SOCIETY**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand concepts of space, place, society, and their interdisciplinary relationships in architecture and urbanism.
CLO2	To examine spatial perception, public space, human behaviour, and socio-cultural dimensions influencing urban environments.
CLO3	To analyze theories of urban design, spatial transformation, identity, and complexity in relation to cities and societies.
CLO4	To explore semiotics, landscapes of power, political systems, and socio-spatial production processes in urban contexts.
CLO5	To evaluate globalization, gentrification, and contemporary socio-spatial changes affecting urban environments and planning practices.

Course Content

Introduction to concepts of space, place and society; interdisciplinary understanding of architecture, urbanism and social theory; conceptualization of place and perception of space; notions of space across fields of knowledge; investigation and design of place; variations in perception of place; naturally evolved and unplanned environments; relationships between people, place and urban form; spatial narratives and socio-cultural interpretations of built environments.

Language of space and human dimensions; space, distance and proxemics; territory and behavioural environments; public space concepts, psychology and social relevance; aesthetics and sensory perception of urban environments; character and imageability of urban areas; typologies of public spaces and factors influencing their use; inclusiveness, accessibility and social interaction in public realms; public life and urban experience.

Pattern language and spatial systems; psychological, ecological, behavioural, geomorphological, growth, visual and design patterns; classification of primary, secondary, tertiary and quaternary patterns; urban morphology and pattern interpretation; semiotics of landscape and non-representational theories; site matters including urban sites, site reach, mobile reach, site construction and urban constellation; socio-legal concepts of ownership, property and territoriality; transitions from place to site and narrative complexity in urban environments.

Traditions and dimensions of urban design; organic, formalist and modernist traditions; morphological, perceptual, social, visual, functional and temporal dimensions of urban form; urban transformations and spatial restructuring; cultural support systems and spatial production; identity theories including place identity, social identity and identity process

theory; complexity theories of cities, city systems and implications for urban planning and design; achievements, limitations and future potentials of complex urban systems approaches.

Society, politics and urban space; individuality and society, cooperation and conflict, urban–rural contrasts and social interaction; family, state and political systems; biological, technological and cultural factors influencing social change; production of space and landscapes of power; urban semiotics and spaces of difference; globalization, gentrification and socio-spatial inequality; contemporary urban transformations and implications for inclusive, equitable and culturally responsive planning and urban design practices.

Learning Resources & References:

1. Bentley, I. (1999). Urban Transformations: Power, People and Urban Design. Routledge.
2. Carmona, M., Heath, T., Oc, T., & Tiesdell, S. (2003). Public Places – Urban Spaces: The Dimensions of Urban Design. Architectural Press.
3. Castello, L. (2010). Rethinking the Meaning of Place: Conceiving Place in Architecture-Urbanism. Ashgate Publishing.
4. Lawson, B. (2001). The Language of Space. Architectural Press.
5. UN-Habitat. (2020). World Cities Report 2020: The Value of Sustainable Urbanization. Nairobi: United Nations Human Settlements Programme.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain concepts of space, place, society and spatial perception in urban environments.	2	1	1
CO2	Analyze public space, behavioural environments and socio-cultural dimensions of urban form.	3	2	2
CO3	Evaluate urban design traditions, identity theories and complexity approaches in cities.	3	2	3
CO4	Apply socio-spatial theories, semiotics and political dimensions in urban analysis and planning.	2	3	2
CO5	Assess globalization, gentrification and socio-spatial transformations in contemporary cities.	2	3	3

Course Code	**:**	AR776
Course Title	:	**TOURISM PLANNING**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	Understand the structure, dynamics, and impacts of the tourism industry at local, national, and global levels.
CLO2	Analyze tourism destinations using the Butler destination life cycle and other assessment models.
CLO3	Evaluate the economic, social, and environmental impacts of tourism development and plans.
CLO4	Examine the roles of stakeholders, communities, and institutions in tourism planning and management.
CLO5	Apply planning tools and techniques to design sustainable and responsible tourism strategies for destinations

Course Content

Introduction to the tourism industry and tourist destinations; understanding tourism as an industry and basic terminologies used in tourism; study of Butler's destination life cycle and its application to various tourist destinations; comparison of tourism industry dynamics in developed and developing countries; economic, social, and environmental impacts of tourism; rationale and need for tourism planning.

Value chain of the tourism industry; identification of various stakeholders and their roles in tourism planning and management; key concepts and issues including management of host communities, visitors, and natural resources; partnerships, collaborations, and stakeholder engagement in sustainable tourism development.

Techniques for tourism value upgradation using Value Chain Assessment (VCA); economic impact assessment models including forecasting techniques, tourism multipliers, and input–output models; methods to evaluate destination carrying capacity; green economic development, carbon credit and management, the role of community education, self-regulation, and community participation in tourism planning.

Nature and scope of tourism plans; tourism plans and policies at local, regional, and national levels; key issues in policy formulation, survey requirements, and data collection; role of stakeholders in plan formulation, implementation, and management; contemporary approaches including sustainable tourism, SMART tourism, and responsible tourism.

Role of e-commerce and technology in tourism; changing dynamics of host communities and hospitality services; addressing challenges posed by new tourism trends; balancing

economic growth with social and environmental responsibility; strategies for integrating sustainability, community participation, and innovation in tourism planning.

Learning Resources & References:

1. Bhatia, K. (2020). *Tourism development: Principles and practices* (2nd ed.). Sterling Publishers.
2. Gunn, C. A., & Var, T. (2010). *Tourism planning: Basics, concepts, and cases*. Routledge.
3. Mowforth, M., & Munt, I. (2015). *Tourism and sustainability: Development, globalisation, and new tourism in the Third World* (4th ed.). Routledge.
4. Page, S. (2020). Urban tourism (5th ed.). Routledge.
5. Shaw, G., & Williams, A. M. (2013). *Critical issues in tourism: A geographical perspective* (2nd ed.). Blackwell Publishing.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Interpret development trends and patterns in the tourism industry.	3	2	3
CO2	Assess the economic, social, and environmental impacts of tourism plans and policies.	3	3	3
CO3	Comprehend and analyze the roles of stakeholders in tourism planning and destination management.	3	3	3
CO4	Prepare tourism plans and strategies for specific destinations incorporating sustainability and stakeholder collaboration.	3	3	3
CO5	Apply assessment tools, value chain analysis, and carrying capacity methods to support tourism planning decisions.	3	3	3

Course Code	**:**	AR777
Course Title	:	**URBAN DESIGN AND RENEWAL**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand principles, theories, and practices of urban design and renewal.
CLO2	To examine urban form, morphology, public spaces, and spatial structure.
CLO3	To analyze regeneration, redevelopment, conservation, and adaptive reuse strategies.
CLO4	To evaluate contemporary urban issues including resilience, mobility, and inclusivity.
CLO5	To prepare context-sensitive urban design and renewal proposals for sustainable urban development.

Course Content

Introduction to urban design: scope, role, and relationship with architecture, planning, and urban development. Elements of urban form including streets, blocks, public spaces, urban edges, landmarks, nodes, and urban fabric. Theories and principles of urban design; imageability, place-making, walkability, inclusivity, and public realm.

Urban morphology and analysis of settlements. Study of urban structure, density, land use, mobility, streetscape, infrastructure, and environmental systems. Techniques for urban analysis including visual surveys, mapping, spatial analysis, behavioural studies, and documentation methods.

Urban renewal: concepts, need, and approaches. Urban regeneration, redevelopment, revitalization, rehabilitation, conservation, adaptive reuse, brownfield redevelopment, waterfront development, transit-oriented development, and smart growth strategies. Policies and programmes related to urban renewal in India and international contexts.

Contemporary issues in urban renewal including housing, informal settlements, heritage conservation, climate resilience, sustainable mobility, green infrastructure, and inclusive public spaces. Case studies of urban renewal and regeneration projects at national and international levels.

Preparation of urban design proposals and renewal strategies for selected urban areas through site analysis, conceptual frameworks, spatial planning, public space design, mobility integration, and sustainability considerations.

Learning Resources & References:

1. Carmona, M. (2021). Public Places Urban Spaces: The Dimensions of Urban Design (3rd ed.). Routledge.
2. Jacobs, J. (1961). The death and life of great American cities. Random House.
3. Lang, J. (2017). Urban Design: A Typology of Procedures and Products. Routledge.
4. Loukaitou-Sideris, A., & Banerjee, T. (1998). Urban Design Downtown: Poetics and Politics of Form. University of California Press.
5. Lynch, K. (1960). The Image of the City. MIT Press.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain principles, theories, and foundations of urban design and urban renewal.	2	1	2
CO2	Analyze urban form, spatial structure, public spaces, and settlement morphology.	3	2	2
CO3	Evaluate urban issues and propose sustainable urban renewal strategies.	2	3	3
CO4	Apply urban analysis, mapping, and spatial planning techniques in renewal projects.	3	2	3
CO5	Prepare and communicate context-sensitive urban design and renewal proposals.	2	3	3

Course Code	**:**	AR778
Course Title	:	**URBAN HERITAGE AND CONSERVATION**
Type of Course	:	Program Elective
Prerequisites	:	-
Course Delivery Structure	:	3-0-0-3
Course Assessment Methods	:	Continuous Assessment, End Assessment

Course Learning Objectives (CLO)	
CLO1	To understand concepts, principles, evolution, significance of urban heritage conservation.
CLO2	To examine cultural, historical, architectural, social, environmental values of heritage settlements.
CLO3	To analyze conservation approaches, documentation methods, policies, legislation, institutional frameworks.
CLO4	To develop sustainable conservation strategies using adaptive reuse, regeneration, participation.
CLO5	To prepare conservation planning proposals integrating urban character, infrastructure, mobility systems.

Course Content

Introduction to heritage conservation: definitions, scope, evolution, and significance of urban heritage. Concepts of tangible and intangible heritage, cultural landscapes, historic urban landscapes and heritage values. Role of heritage in identity, tourism, economy, and sustainable urban development.

Urban heritage and historic settlements: morphology, streetscape, public spaces, traditional neighbourhoods, and architectural character. Documentation and inventory techniques for heritage areas including mapping, photographic documentation, condition assessment, and heritage listing.

Principles and approaches to conservation: preservation, restoration, rehabilitation, adaptive reuse, regeneration, revitalization, and redevelopment. International charters and guidelines including UNESCO recommendations, Venice Charter, Burra Charter, and Historic Urban Landscape approach.

Heritage legislation, governance, and institutional frameworks in India and international contexts. Role of agencies such as ASI, INTACH, UNESCO, and urban local bodies. Community participation and stakeholder engagement in heritage conservation.

Contemporary issues in urban conservation including heritage-sensitive planning, tourism pressures, climate change impacts, disaster risk management, gentrification and sustainable development. Case studies of heritage cities, conservation projects and urban revitalization initiatives in India and abroad.

Preparation of conservation-oriented planning strategies for selected heritage areas through analysis of urban character, land use, mobility, public spaces, infrastructure and socio-cultural aspects.

Learning Resources & References:

1. Bandarin, F., & van Oers, R. (2012). The Historic Urban Landscape: Managing Heritage in an Urban Century. Wiley-Blackwell.
2. Feilden, B. M. (2003). Conservation of Historic Buildings (3rd ed.). Routledge.
3. ICOMOS. (1964). International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter). Paris: International Council on Monuments and Sites.
4. Pendlebury, J. (2013). Conservation in the Age of Consensus. Routledge.
5. UNESCO. (2011). Recommendation on the Historic Urban Landscape (HUL). Paris: United Nations Educational, Scientific and Cultural Organization.

COURSE OUTCOMES (CO)		**Program Outcomes(PO)**		
		1	**2**	**3**
CO1	Explain principles, values and significance of urban heritage and conservation.	2	1	2
CO2	Analyze historic urban areas using documentation and heritage assessment techniques.	3	2	2
CO3	Evaluate conservation issues and formulate sustainable heritage management strategies.	2	3	3
CO4	Apply conservation, adaptive reuse and revitalization approaches in heritage contexts.	2	3	3
CO5	Prepare heritage-sensitive planning and conservation proposals integrating socio-cultural and environmental considerations.	3	3	3