

Section 2: Course Curriculum

The Masters of Planning (with specialization in Urban Planning) programme of the Department of Urban Planning is designed to prepare students in the skills of analyzing the physical, social, cultural, economic and ecological dimensions of urban settlements, comprehending their problems, and evolving measures to address the issues and emerging challenges in a planned manner. Along with a group of core courses common to all planning programmes, specializations are built around courses such as city and metropolitan planning, urban infrastructure, municipal finance, urban information system, GIS, community participation, disaster risk reduction and resilience, planning for heritage areas, urban development management and governance, project planning, policies and laws, professional practice and ethics. The programme includes studio exercises in plan preparation through live case studies related to comprehensive and micro level urban development issues, and problems related to various cities and towns in the country.

The first semester is a foundation course in the format of an integrated program with four other planning departments (Regional Planning, Environment Planning, Housing and Transport Planning). The program include studio exercise for formulation of Master Plan and Zonal Development Plans for a selected city (Second Semester Studio), formulation of Infrastructure Plan and DPR (of infrastructure sectors) for a selected city (Third Semester Studio) and individual thesis project on any urban issues (Fourth And Final Semester).

Core Courses

2nd SEMESTER

UPC-2.1: City and Metropolitan Planning

Module 1: Urban Structure and Growth Implications:

Growth of cities; cities as engine of growth; urban sprawl; land value, economic attributes of activity location, economic forces in urban development; Structure of City Regions, area of influence, Impact of technology on urban forms; Transportation and urban form; location characteristics and impact of urban settlements.

Module 2: Theories of Development and Emerging Concepts

Theories of urban structure and land use- Centre place theory, urban realm model, core frame theory; New urbanism; Territorial Development Theory – Growth pole theory, urban bias critique, secondary cities and urban diffusion; Emerging Rural Urban Relationship models – urban rural linkage, expanding city, globalization and extended metropolitan region, Desakota model, Networked model; Territoriality of rural – urban interaction; Peri-urban Interface (PUI) case studies.

Module 3: Planning Norms and Standards

Spatial standards for residential, industrial, commercial, institutional, transport, ecological spaces, recreational areas etc.; space standards for facility areas, utilities and networks; performance standards.

Module 4: Plan Preparation Approaches and Techniques

Approaches for preparation of urban development plans, Master Plans, Structure plans and Strategy Plan; Public Participation and plan implementation; technique of urban renewal and redevelopment; System approaches to planning; Threshold analysis, retail location and industrial location analysis; transport system analysis

Module 5: Planning Approaches for Special Areas

Special area planning-definition, types, attributes, requirements, planning process; inner areas, peri-urban areas issues and planning approaches; smart city- concepts, elements, features, planning approaches and strategies, policy efforts in India; inclusive planning- concepts and components, essential dimension of inclusive planning; growth of informal sector, characteristics, linkages with formal sector, planning interventions, inclusive zoning, development and building regulation, slum improvement;

Module 6: Best Practices in City and Metropolitan Planning

Best practices of city and metropolitan in India and abroad, inter- disciplinary policy issues and public actions for guiding metropolitan development.

UPC-2.2: Infrastructure Planning

Module 1: Water Supply System:

Water supply systems and networks, networks mapping; water sources, quality and quantity requirements, collection and conveyance techniques; water requirement for various land uses; Factors affecting water demand; Storage facilities; Distribution Systems; rain water harvesting system- Locational Criteria , Implications on Land Use and Density of Water Harvesting System; Innovation Methods and successful urban supply system practices; policies, land requirements and phasing of water supply systems

Module 2: Storm Water, Sanitation and Sewer System:

Storm water drainage networks, network mapping; general considerations and principles, physical layout, design principles, Data requirement, estimations of sewer generation and network requirements; Sanitation and Sewer System : General considerations and principal , Sewage Disposal and treatment Methods; Characteristics of Waste Water, Industrial Pollutants and their Effects, Innovation Approaches of Sewage disposal in urban area and low cost appropriate technologies for sanitation

Module 3: Solid Waste Disposal and Management:

Elements of Solid Waste Management, Classification and Characteristics of Solid Wastes; Methods for Solid waste Collection, Storage, transport and disposal ; Processing and Treatment of Solid Wastes; Land Filling methods of Solid Waste Management; Best practices for solid waste management.

Module 4: Energy, Telecommunication and Fire Fighting Services:

Power Supply- Sources of Electricity; Transmission, Distribution and Supply network; Sustainable Energy Planning; Telecommunications – Infrastructure and Network Systems; Digital Infrastructure Fire Fighting Services- Planning for Fire Protection Services and Space Standards;

Module 5: Transport System:

Types and characteristics of transport systems; determinants of transport demand; planning norms and standards; Principals of transport infrastructure planning and design- roads and intersection, street infrastructure elements; pedestrian and cyclist infrastructure; parking facilities; principles of traffic management.

Module 6: Social Infrastructure:

Social infrastructure – Typologies; Planning norms and space standards for educational, health, recreational and social- cultural facilities; amenities for urban settlements.

UPC-2.3: Sustainable Planning and Development

Module 1: Introduction to Sustainable Development:

Sustainable Development- Definitions, concepts and Parameters; Eco- City Approach; Kyoto Protocol, Intergovernmental Panel on Climate Change (IPCC), united nations framework convention on climate change; Indian network of climate change assessment, global environment facility , and clean development mechanism; UNHABITAT policies, sustainable development goals, new urban agenda, sustainable cities programme (UNEP and UN-Habitat), Localizing 21 (UN- Habitat)

Module 2: Principle of Sustainable Planning:

Concepts of sustainable planning, three pillars of sustainability and its implication in planning process; Environmental preservation; commerce and livability; Walkability and Connectivity; Integration of diverse community features; Strong sense of place.

Module 3: Ecological Principals in Planning:

Natural drainage and water bodies; Application of Ecological Principles in Sustainability; Carrying Capacity Based Planning – Concept, Parameters and Indicator Measures; Models and Case Studies in Urban and Regional Development

Module 4: Climate Changes and its Impact:

Basic concepts and definitions of Climate Change; Urban Heat Islands; Climatic Change and Human History; Impacts of Climate Change; Climate as Forcing Variable, Locational Attributes, Sensitivity and Vulnerability of Different Sectors; Extreme events and their effects

Module 5: Urban Environmental Management:

Urban Environment and Planning ; Human activities and energy in Cities; contribution to GHGs; Environmental Impact and Strategic Environmental assessment for Urban area; Ecological Footprint Analysis of Cities; Sustainable Lifestyle Assessment.

Module 6: Low Carbon Urban Development:

Low carbon urban development strategies- concept of 3-Rs: “Recycle-Reuse and Recovery”; Low carbon transport modes and mobility options; Land Capability and Suitability Analysis; Compact City Concepts Use of Non-Conventional Energy Sources; Urban Water Treatment, Recycling, Recycling and Harvesting; Pollution Control Measures for Industrial Wastes, Hazardous Wastes, Biomedical Wastes, Domestic Waste Water, Air Pollutants and Noise.

UPC-2.4: Project Planning and Management

Module 1: Importance of Project Management:

Definition of Project, Project Management – Definition and its importance; Stages of Project Life Cycle; cause of Project Delay; Role of Project Manager; Attributes of a Successful Project Management

Module 2: Project Appraisal:

Introduction to Project Appraisal – Types of Feasibility, Financial and Economical Appraisals, Project Financial Appraisal Techniques; Market Analysis- survey methods, market characterization, demand forecasting; Technical analysis- material, equipment, factors of production availability, implementation schedule, suitability of the plans, layout and design; supporting infrastructure requirements, capital budgeting, estimating, estimation of casting of components; social cost benefit analysis.

Module 3: Project Planning and Scheduling:

Introduction to Project Planning- Process, Investment Phase; Project Work (Work Breakdown Structure), Manpower and Organization, Project Finance, Information System; Process of Project Formulation and constraints; Breakeven Analysis; Sensitivity Analysis; Project Budgeting; Project Scheduling – definition and steps; Network techniques and activity on Arc/Node; Forward Pass and Backward Pass; Critical Path and Slack; PERT; concept of Gabtt Chart

Module 4: Project Financing:

Project financing need assessment; sources of funds; disposition of funds, planning for project financing

Module 5: Project Monitoring:

Project Monitoring and criteria for decision making; Parameters and Tools of Control; Use of Network Analysis in Project Monitoring; Reporting and Corrective Actions; Resource Management and Project Reporting

Module 6: Project Evaluation:

Project Evaluation- Methods, tools, time frame and results; Project Cash Flows; Principals of Cash Flow Estimation; Project Benefits; Financial Closure, Presentation of evaluation findings.

Department Electives (DE)

DE-2.1: Urban Information System and Spatial Analysis

Module 1: Importance of Urban Information System

Information Scales and Levels; Pre- Conditions for Using Planning Information Systems; Representing, Modelling and Impact Analysis of the Data; Query Measurement and Transformations, Summary Statistics and Inference

Module 2: Urban Information Systems for Plan Preparation and Policy Planning

Information needs for plan preparation and policy planning; Tools for spatial data handling-type, system, nature, hierarchy and value; raster and vector data structures; Analysis tools and software; Spatial data models, Geo-database; geospatial information regulation Bill 2016

Module 3: Urban Information Sources

Planning Information Systems- National Natural Resources Management System (NNRMS), National Urban Information System, National Observatory, Municipal Information Systems, Land Information Systems, Land Information Systems; Global Navigation Satellite Systems, NUIS Guidelines & Design Standards;

Module 4: Geographic Information System (GIS) and Remote Sensing Techniques

Geographic Information Systems- concept, components, benefits; spatial data entry into GIS, Data structure for GIS; Mapping and spatial analysis software, Linking of attribute data, Spatial data aggregation, Spatial data generalization; Raster data capture; Cloud based GIS on Bhuvan platform; GIS based Master Plans; Resource Satellite, Sensing Capabilities; Aerial Photography; Digital Survey; Raster Data Processing and Analysis; Resolutions; Geo-Rectification; Geometric Distortions, Image Enhancement, Transformation, Segmentation; Image interpretation and analysis, 3 D Terrain Modelling

Module 5: Urban Information Management

Data base management system; big data analysis and applications, Internet of Things (IOT) and its application in urban sector; management of tabular data, spread sheets, introduction to statistical packages with advantages and limitations; municipal information system- definition, need scope, limitations;

Module 6: Spatial Analysis Techniques

Spatial data and analysis unit, Spatial data techniques- spatial interaction measure, population and job density decay curve, urban concentration and land use diversity measure, measures of urban structure analysis, facility location analysis, Gini's coefficient, Accessibility measure

DE-2.2: Land use and Transport Planning

Module 1: Importance of Land use-Transport Integration

Land use and mobility patterns in cities, implications of land use patterns on transport and mobility, land use and transport decisions, need for sustainable development and sustainable transport; need and benefit of land use transport integration, case cities of land use- transport integration.

Module 2: Principles of Land use- Transport Integration

Land use transport integration- definition and concept, land use transport cycle, importance of accessibility, factors affecting land use transport integration, tools and land use – Transport Integration, key elements of integration, Integration land use and transport in the planning process, Institutional integration and legal mechanism.

Module 3: Land Use-Transport Model

Components of Land use transport model, accessibility – concept, measures and quantification, types of land use transport model- Density saturation gradient method, Hansen’s accessibility model, intervening opportunity model, Grain Lowry model; strategic land use transport model

Module 4: Traffic Impact of land Development

Principles of traffic impact analysis, land development attributes, traffic generation rates of different land uses, land development impact on traffic congestion on road segment, intersections and parking , impact on public transportation, pedestrian traffic and safety

Module 5: Transit Oriented Development (TOD)

Transit Oriented Development- Definition, concepts and key components; principals of TOD, planning norms and standards of TOD, pre-requisites of TOD , financing TOD, role of stakeholder, case studies of TOD

Module 6: Case Studies on Land use-Transport Integration

Best practices of Land use transport integration in India and abroad, inter-disciplinary policy issues and public action for guiding land use transport integration.

S 1 STUDIO

S1.1. Preparation of a statutory Development Plan of a City interfaced with city-region/zonal level plan studies

S1.2. Course on Quantitative Methods and GIS Applications focusing on statistical data analysis and use of GIS for spatial analysis

3rd Semester

Core Courses

C3.1 Urban Development Management and Governance

Module 1: Introduction to Development Management

Definition, objectives and scope of management; Role of management in developing economy; Decision making process and corporate activity in urban development; Application of management techniques in urban planning and development.

Module 2: Land Economics and Real Estate Development

Economic concepts of land, land pricing/ valuation; economic principles of land use; demand forecasting for land use: factors affecting land supply and demand; land development methods,

supply management, Demand side management; real estate markets, type of property development and its impact on supply and demand, method of development, environmental considerations.

Module 3: Urban Redevelopment

Strategies and evaluation of redevelopment; role of public sector agencies in redevelopment; Area based redevelopment Initiatives; Property led redevelopment policies; Investment and Funding of Urban Redevelopment Schemes; Role of private sector; Development Potential and Pricing; Plot reconstitution; Renewal through Housing and Mixed Use Development; Community Participation

Module 4: Urban Governance, Institutions and Organizations

Urban Governance- Definition, concepts and components; hierarchy and structure, form of governance; Institutional and organizational framework, existing institutional and organizational setting for urban management in India; distribution of responsibilities ; special purpose vehicles (SPV's) in the urban sector ; significance of organizational framework; Difference between institutions and organizations;

Module 5: Urban Local Governance and its Reforms

Urban local governance- type, organization, power , functions, resource, state supervision control and their working; improvement trust- organizations, scope of their powers and functions and their working; City development authorities: organizations, scope of their power and functions, resources, and their working; administrative reforms in local governance; Organisational Restructuring of Local Governments; capacity building; NGO's.

Module 6: Participatory Process in Urban Governance

Stakeholder participation- roles and responsibilities, access to governments; Citizen Participation in urban development and management; Inter-organisational relations and coordination at local level; role of digital engagement and social media

C 3.2 Development Finance

Module 1: Overview of Development Finance

Development Finance- approaches, concepts, components, process, credits rating; Role of Improvement Trusts, Development Authorities, SEZs and Special Purpose Vehicles(SPV) in Urban finance Management.

Module 2: State and Municipal Finance

Central Finance Commission (CFC) and State Finance Commission (SFC)- Constitution, Powers and Functions; Consolidated Fund (Central and State); Centrally Sponsored Schemes; Municipal Finance- Categorisation of Municipal Sources of Revenue, Internal Vs. External Revenue, Capital Vs. Revenue

Receipt; Municipal Finance Assessment Framework; Reforms in Municipal Finance- Unit Area Method in Property Tax Calculation, Rationalisation of User Charges; Streamlining Municipal Tax Administration

Module 3: Investment Planning and Appraisal

Investment Planning- Process, components and investment needs; budgeting, finance investments in infrastructure and services; Manpower planning- performance appraisal, motivational aspects; Integrated reporting system, works standard oriented cost control, turnkey system, inventory cost control technique, unified status index technique.

Module 4: Public Private Partnership (PPP)

Concept, need, preconditions for Partnerships; Advantages of Collaboration, Methods of Promoting Participation, Regulations and Administrative Procedures; Role of Government as Partner, Regulator and Enforcer; Principles of PPP- Contractual Framework, Selection of Service Provider, Payment Mechanism, Monitoring and Evaluation; Risk and Revenue Sharing; Regulatory Authority for PPP; Model Contract Agreement.

Module 5: Innovative Methods of Financing Urban Development

Monetary Exaction- Betterment Levy, Impact Fee, External Development Charges and Vacant Land Development Tax; Land Exactions- TDR, Town Planning Scheme, Monetisation of Underutilised Public Assets; Valorisation Charges; External Finance- Debt Financing, PPP, Financial Intermediaries, Municipal Bond, Pooled Finance.

C 3.3 Urban Risk and Disaster Management

Module 1: Urbanisation and Associated Risks

Urbanisation patterns, resource consumption and environment versus economy and their impacts; Resource Depletion and Pollution; Environmental Concerns and Challenges, impact of human activity on environment; Inter-relation with urban risks; Causative factors; role of land-use planning, zoning and development control regulations in managing urban risks

Module 2: Urban Risks and Climate Change

Urban Risks- Definitions, Types and nature, Magnitude; Hazard, vulnerability and risks; Climate Change- Risks and Resilience in cities

Module 3: Urban Risks Assessment

Methods and approaches to urban risk assessment; hazard impact assessment, institutional assessment; socioeconomic assessment, Risk Mitigation and Risk Transfer; Causes and risk mitigation strategies for industrial, chemical and biological disasters

Module 4: Disaster Types and Impacts

Disasters- Definitions, types and examples of disasters across the World; Natural disasters and manmade Calamities, Degree of Damage, Frequency of Occurrences and Other Historical Facts; Classification of Disasters in India; Impacts of disasters, land use planning, building bye laws and disaster safe construction practices for different types of disasters

Module 5: Disaster Vulnerability Preparedness

Identification of Disaster prone areas; Forecasting and early warning systems for various types of disasters; communication and information technology in disaster management; Disaster Vulnerability Mapping; Disaster Preparedness, Response and Post Disaster Recovery and Rehabilitation Measures; Disaster management principles; local, district and State disaster management groups , structures and functions; prevention and preparedness activities; response and recovery activities; disaster declaration arrangements

Module 6: Disaster Mitigation and Management

Kyoto Framework of Disaster Mitigation and Management; Disaster Management Policies and Act — National and States; Select Global Practices. Disaster Coordination Centres — functions, logistics, operations and planning; Developing and Assessing Disaster Management Plans; Community engagement; Standard Emergency Warning Signal (SEWS); and the Emergency Alert System, Basic Principles of Incident Command System — Facilities, Resource Management, Event Planning Process, Emergency response management principles and concepts; ICT in emergency responses and management;

Department Electives (DE)

DE 3.1 Community Planning and Participation

Module 1: Overview of Communities

Overview of communities — definition, type, attributes, activity patterns , locational patterns; socio-cultural aspects; community needs and spatial requirements ; socio-economic implication,

Module 2: Principles of Community Planning

Community planning- Principles, approaches and key considerations; spatial-socio-economic linkages; inclusion and quality of life; neighbourhood planning; local area planning

Module 3: Local planning Tools and Techniques

Participatory Learning (PLA) tools: Mapping local context and problem identification, Focus Group Discussions, ; Audit of communities and its facilities; rapid assessment of community needs and planning intervention

Module 4: Role of Community Participation

Participatory process in housing and community development; Community participation- community involvement, community action; role of CBOs, NGOs, SHGs, etc.

Module 5: Process of People's Participation

Participatory approaches, Typology of participation, Key principles of applying participatory methods and tools, Participatory attitudes and behaviour, Teamwork skills in the context of participation, PLA/PID Tools, Participation as a process, Participatory Monitoring and Evaluation, Beneficiary Assessment, social assessment, stakeholder analysis,

Module 6: Case Studies on Community Participation

Detailed cases of community participation in areas of provision of housing/shelter, electricity, water supply, sanitation, solid waste disposal, transport , social infrastructure — health , education and cultural facilities; economic upliftment, resource mobilisation; maintenance and management of community assets

DE 3.2 Urban Design and Heritage

Module 1: Elements of Urban Design

Elements of urban form; Organization of spaces and their articulation in the form of square, streets, vistas and focal points; Image of the city and its components - edges, paths, landmark, street features, skyline, etc., Elements of urban design.

Module 2: Urban spaces and Urban Form

Hierarchy and nature, sense of enclosure, isolation and continuity; determinants of urban form; urban massing in built form; landscape elements, open spaces, water bodies.

Module 3: Urban Design in Human Habitation

Social/cultural/ecological/energy Determinants of design; image ability of the city; Structure of urban spaces-Location criteria of activities and urban uses; urban regeneration, renewal, rehabilitation, revitalization, reconstruction and redevelopment- concepts, interventions, processes, approaches and methods, tools.

Module 4: Heritage Conservation Typologies

Natural heritage conservation- types, policies for conservation, regulatory measures, community participation; built heritage conservation- determinants of built form on heritage; historical urban infrastructure and traditional water harvesting system.; intangible cultural heritage and development issues; conservation strategies- old city, inner areas; Integration of historic monuments, areas, cores, urban system in the development process and land use; regulatory measures and community involvement

Module 5: Principles of Conservation

Basic concepts of conservation values- overview and introduction; Principles for judging the conservation importance of sites, area and related typology; scope and basic technique of urban conservation; national policies and programmes

Module 6: Management of Urban Conservation Assets

Legal and administrative aspects, archaeological acts/charters pertaining to conservation, development and conservation; case studies on management of urban conservation of sites/ area in India and abroad.

Institutional Elective (1E)

I E 3.1 Inclusive Cities

Module 1: Importance of Inclusive Development

Urban development patterns, inequities and need for Inclusive development, growth of informal sector , Needs, access to shelter, services and livelihoods of informal sector ; Understanding inclusive growth- concept, theories and components; essential dimensions of inclusive planning

Module 2: Stakeholders in Inclusive Urban Development

Disadvantaged groups —urban poor, informal sector, gender, children, elderly, disabled, displaced people; Causative factors, determinants, informal sector- location characteristics, functions, economic contributions, linkages with formal sector; impact of informal sector on urban development

Module 3: Principle of Inclusive City Planning

Inclusive city planning- Need, concept and pre-requisites, Affordable housing; resilient and sustainable urban form; social and economic development; key principles- Sustainability and Resilience, Accessibility, Diversity, Open Spaces, Compatibility, Incentives, Adaptability and Identity

Module 4: Participatory Planning for Inclusive Development

Importance of participatory planning for inclusive development; approaches and methods, of participatory planning, role of stakeholders (including civil society organizations) , constraints, pre-requisites

Module 5: Management of Inclusive Cities

Management of inclusive cities- need and approaches- Inclusive zoning, development and building regulations, slum improvement; related acts; five year plans, policies and programmes.

Module 6: Best Practices of Inclusive City Planning

Policies for inclusive city planning; Best practices of inclusive Planning in India and abroad- planning approach, procedures and impacts, inter-disciplinary policy issues , public action and participation for guiding inclusive planning in cities.

S 2: STUDIO

- i. Preparation of Strategic Urban Infrastructure Plan for a case city along with Pre-feasibility studies of various sectors / infrastructure projects/schemes of the Plan (DPR)
- ii. Thesis related research seminars

4th Semester

Core Courses

C4.1 Planning Legislation and Professional Practice

Module 1: 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 & Development;

Module 2: Planning Legislation

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.

Module 3: Planning and Development Organizations

Town & Country Planning Organization, Urban Development Departments , City Improvement Trust, Development Authorities, Municipal Corporation etc. — objectives, functions and duties, organisational structure, technical capacity , statutory obligations, budgetary outlays; coordination and implementation issues

Module 4: Public Participation in Planning Process

Role of interdisciplinary groups; community participation process in planning; Appreciation of the decision-making processes, process in relation to varied consultancy assignments of planning.

Module 5: 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 general public; Scope of services for different projects; Consultancy agreements and safeguards; Fees and scales of professional charges; negotiation, liability, code of conduct, arbitration

Module 6: Project Formulation and Implementation

Project context; Project rationale and objectives; Bid documents, Tenders, Contracts ;

Implementation approaches and methods, Work plan, Budget, Assumptions, risks and sustainability; Implementation arrangements; Organizational structure and stakeholder involvement mechanisms; Reporting, review, monitoring and evaluation; Dissemination and mainstreaming of project learning

C 4.2 Urban Development Policies

Module 1: Public Policy and Planning

Nature of public problems, planning as a public issue, policy process, limitations in public and private Sector; Strategic policy planning; Overview of policy analysis- scope, significance and contextual perspectives, Public policy delivery agencies and Implementers; Public policy implementation: Gaps and problems

Module 2: Policy Making Process

Policy Process - problem definition, policy objectives and options, policy implementation, policy evaluation and maintenance; Policy making approaches- Power approaches, Institutional approaches, Strategic Planning, Rational approach and Simon's Rationality Model; Decision-making process and techniques; Policy monitoring- approaches and techniques; Role of non-officials in policy making; Intergovernmental relations and public policy issues; Public policy implementation- Approaches and models; Inter-organizational relations and public policy implementation;

Module 3: Policy Scenario Building and Evaluation

Techniques and approaches to policy building; policy evaluation Indicators; policy scenarios formulation; Policy evaluation- role, process and criteria; Policy implementation; performance evaluation and impact.

Module 4: Urban Development Policies in India

National **Urban** Sanitation Policy, National Urban Housing & Habitat Policy , National Policy for Urban Street Vendors , National Environmental Policy , National Urban Transport Policy , National Water Policy , National Policy on Energy; Emerging policies and programmes of government- JNNURM, AMRUT , HRIDAY etc.

Module 5: Emerging Policy Thrust Areas

Policies to promote efficient urban spatial development ; development of eco-friendly neighbourhoods; flexible FSI in urban design and planning; transport and land use integration ; integrated spatial and economic planning; inclusionary zoning regulations; renewal of neglected historic districts and derelict inner city areas ; integrating environment in urban planning and development; green urban economy approach; environment and social opportunities of densities; green urban infrastructure ; green urban governance

Module 6: Case Studies on Urban Development Policies

Best practices of urban development and planning policies- approach and impacts; procedure and interdisciplinary issues related to policies.

Institutional Elective (IE)

IE 4.1 Climate Resilient Urban Development

Module 1: Global Climate Change

Basics of Climate Change- Greenhouse Gases, Anthropogenic Causes, Carbon Cycle, Global Warming, key associated planning terms- climate variability, Exposure, mitigation, resilience, adaptation; Inventory of GHGs; Climatic Change and Human History

Module 2: Urbanisation and Climate Change

Urbanisation patterns , resource intensities, energy consumption in cities , determinants of energy demand ; Urban Heat Islands; phenomenon of climate change, factors influencing climate change, climate risks to cities- floods, storm, sea levels rise, water supply, high temperature, heat waves, health risks ; environment issues for cities

Module 3: Climate Change Impacts

Impacts of Climate Change, Climate as forcing variable, locational attributes , sensitivity and vulnerability assessment of different sectors, Extreme events and their effects; cities as drivers of climate change; impact of climate change on cities; need for mainstreaming climate change in city development strategies

Module 4: Climate Resilient Policies for cities

Urban vulnerability to climate change; Need for city resilience, Policies related to energy planning, conservation, climate change mitigation and adaptation; paradigm shift to resilient cities- renewable energy cities, carbon neutral cities, distributed cities, eco-efficient cities, sustainable transport cities; Low carbon urban development strategies- Concept of 3-Rs: Recycle-Reuse and Recovery; Compact City Concept; strategies for integrating environment in urban planning and management

Module 5: Climate Change in India and Policy Efforts

Trends of climate change in India, policy efforts, mechanism and measures for mitigating and adapting to climate change; impacts of policy efforts

Module 6: Best Practices of Climate Resilient Cities

Case studies on climate resilience in cities of the world; policy guidelines for integrating climate change into city development strategies, guiding principles for city climate action planning

THESIS

The students in this semester are expected to continue work on their research area finalised in 3rd semester (as part of Thesis Research Seminar) and complete stages of data collection, data analysis, issues identification, impact assessment and formulation of strategies/proposals before completing their thesis and defending their thesis at viva voce examination.