MODEL CURRICULUM

for

M. Plan / M. Tech (Planning)

2011

ALL INDIA COUNCIL FOR TECHNICAL EDUCATION
7th Floor, Chandralok Building, Janpath
New Delhi – 110 001

PREFACE

1

Town and Country Planning being a multi-disciplinary discipline, the curriculum for the Postgraduate Programmes need to take into consideration the various basic qualifications eligible for post-graduation in town and country planning viz. (i) Bachelor of Architecture, or (ii) Bachelor of Engineering (Civil), or (iii) Bachelor of Planning, or (iv) Postgraduation in Geography or Economics or Sociology. Besides the model curriculum for postgraduate programmes in Town and Country Planning also needs to impart such basic skills that would help students later in their careers to serve in various professional capacities in planning, development and management agencies in the public sector as well as in private consultancy organizations. During the programme, the students are also required to be equipped with critical knowledge of basic theories, techniques, and design concepts so that they can assume their assigned professional roles as members of multi-disciplinary teams which invokes survey, analysis and plan making be it in the area of urban planning, development and management, regional planning, housing, transport planning, infrastructure planning, environmental planning and other related disciplines.

At present, M. Plan / M. Tech. (Planning), being offered by various Schools of Planning, university departments, and IITs impart general education in town and country planning, However, the School of Planning and Architecture, New Delhi provides specializations in Urban Planning, Regional Planning, Environmental Planning, Housing, Transportation Planning while the CEPT University, Ahemedabad, provides specializations in Urban and Regional Planning, Environmental Planning, Housing; and Infrastructure Planning and Management, etc. The course curriculum of these programmes is spread over four semesters during which the students attain in their respective fields of specialization in planning and managing projects of all magnitudes. The programme culminates in the fourth semester with two to three theory subjects and mandatory thesis presentation whereby a student is trained in research methodologies, as well.

The Task Force was constituted by the All India Board of Town Planning Education, AICTE in its meeting held on 1st May, 2008 under the convenership in Prof. (Dr.) A.N. Sachithanandan with Prof. (Dr.) Najammuuddin; Prof. Shivanandwsamy; Prof. (Dr.) Ashok Kumar; Shri J.B. Kshirsagar; and Dr. S.K. Kulshrestha as Members. The First meeting of the Task Force was held on 23rd September, 2008 whereby the overall perspective for postgraduate in planning was formulated. The member of Task Force desired that the existing curriculum may be thoroughly examined before the new one is framed. Accordingly, in the second meeting of Task Force held on 29th May, 2009; a draft framework of curriculum was discussed and deliberated in detail, and the distribution of courses and studio projects for each of the specialization were finalized. The draft curriculum, so prepared was presented and discussed at the second meeting of the AIB-TCP held on 25th November, 2010 at AICTE, NBCC Building, and it was suggested that the same may be circulated to the Schools of Planning for their suggestions.

The draft curriculum of postgraduate programmes in town and country planning was accordingly circulated to all the Schools of Planning by the Institute of Town Planners, India for their suggestions. The Institute of Town Planners, India; then organized one-day Workshop in

which faculty members of all the Schools of Planning; State and Central Government representatives besides other stake-holders were invited on 18th December, 2010 at the Conference Hall of the Institute of Town Planners, India, New Delhi, so that necessary variations either location specific or market drawn can be suitably incorporated within the larger framework. Shri Sundeep Sarin, Adviser (Academic), AICTE and Shri D.S. Meshram, Chairman, All India Board of Town and Country Planning Education, AICTE participated in the discussions.

In addition to the points emerged during the discussions, the faculty members representing various specializations from different Schools of Planning were requested to send further details and suggestions about their programmes and curriculum. Accordingly, the additional updated version of curriculum along with their comments was received from various Schools by January 2011 by the ITPI. To finalize the curriculum and syllabus a meeting of all Head of the Departments of School of Planning was again convened by the Institute of Town Planners, India on 14th March, 2011 at the Conference Hall of the Institute of Town Planners, India, New Delhi.

We would like to place on record the assistance rendered and facilities provided by the Institute of Town Planners, India for the finalization of the curriculum. Besides, the untiring efforts of Prof. (Dr.) Ashok Kumar for compiling all the information received from various Schools and Departments. The AIB-TCP would like to thank Prof. (Dr.) A.N. Sachithanandan, Convener, and the members of the Task Force for their hard work in finalization of the curriculum.

Model curriculum comprises of nine sections in all. The Section - 1 gives the introduction and background while Section - 2 gives various specializations and subjects being offered and Section - 3 gives the Integrated First Semester which will be common to all the specialization. Section - 4 deals with specialization in Urban Planning, Section - 5 deals with specialization in Regional Planning, Section - 6 deals with specialization in Environmental Planning, Section - 7 deals with Specialization in Housing, Section - 8 deals with Specialization in Transportation Planning, and Section - 9 deals with specialization in Infrastructure Planning and Management. It is hoped that various Schools of Planning and IITs will adopt this curriculum to suit to their specific local requirements and framework of the universities to which they may be affiliated.

(D.S. Meshram)

M. PLAN/ M. TECH. (PLANNING) – SPECIALIZATIONS OFFERED

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(1) SPECIALIZATION IN URBAN PLANNING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
UP. C.2.1 : City and Metropolitan Planning
UP. C.2.2 : Infrastructure Planning
UP. C.2.3 : Urban Heritage Conservation
UP. C.2.4 : Advanced Planning Techniques
UP. C.2.5 : Studio Course
Elective Subjects (Select any one)
UP. E.2.1 : Inclusive Urban Planning
UP. E.2.2 : Planning for Tourism

Second Year: Third Semester
Core Subjects
UP. C.3.1 : Urban Development Management
UP. C.3.2 : Project Planning and Management
UP. C.3.3 : Urban Governance
UP. C.3.4 : Politics and Planning
UP. C.3.5 : Studio
Elective Subjects (Select any one)
UP. E.3.1 : Environment, Development and Disaster Management
UP. E.3.2 : Energy, Climate change and Urban Development

Second Year: Fourth Semester
Core Subjects
UP. C.4.1 : Development Finance
UP. C.4.2 : Legal Issues and Professional Practice
UP. C.4.3 : Thesis

(2) SPECIALIZATION IN REGIONAL PLANNING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
RP. C.2.1 : Planning for Regions
RP. C.2.2 : Infrastructure Management
RP. C.2.3 : District Planning and Rural Development
RP. C.2.4 : Land Markets and Management
RP. C.2.5 : Poverty and Development
RP. C.2.6 : Studio

Second Year: Third Semester
Core Subjects
RP. C.3.1 : Environment and Development
RP. C.3.2 : Project Planning
RP. C.3.3 : Institutional Analysis and Governance
RP. C.3.4 : Politics and Public Policy
RP. C.3.5 : Resettlement and Rehabilitation
RP. C.3.6 : Studio

Second Year: Fourth Semester
Core Subjects
RP. C.4.1 : Financing Development
RP. C.4.2 : Legal Issues in Planning
RP. C.4.3 : Thesis

(3) SPECIALIZATION IN ENVIRONMENTAL PLANNING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
EP. C.2.1 : Theory of Environmental Planning
EP. C.2.2 : Environmental Design
EP. C.2.3 : Environmental Monitoring and Assessment
EP. C.2.4 : Environmental Impact Assessment
EP. C.2.5 : Environmental Monitoring and Assessment (Laboratory)
EP. C.2.6 : Studio

Second Year: Third Semester
Core Subjects
EP. C.3.1 : Environmental Economics and Auditing
EP. C.3.2 : Environmental Protection and Management
EP. C.3.3 : Environmental Legislation, Evaluation and Practices
EP. C.3.4 : Advanced EIA Techniques
EP. C.3.5 : Planning Legislation
EP. C.3.6 : Studio

Second Year: Fourth Semester
Core Subjects
EP. C.4.1 : Formulation, Financing and Management of Developed Projects
EP. C.4.2 : Seminar on Emerging Environmental Concepts
EP. C.4.3 : Thesis

(4) SPECIALIZATION IN HOUSING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
H. C.2.1 : Urban and Rural Housing Policies and Programmes
H. C.2.2 : Housing Standards, Design and Projects
H. C.2.3 : Materials, Technology and Infrastructure
H. C.2.4 : Urbanization and Land Management
H. C.2.5 : Housing Finance and Project Formulation
H. C.2.6 : Studio

Second Year: Third Semester
H. C.3.1 : Real Estate and Housing Markets
H. C.3.2 : Informal Housing, Slums and Poverty
H. C.3.3 : Disasters and Settlements
H. C.3.4 : Legislation and Professional Practice
H. C.3.5 : Inclusion, Participation and Communication
H. C.3.6 : Housing Studio

Second Year: Fourth Semester
H. C.4.1 : Governance and Management for Housing
H. C.4.2 : Housing for Special Area
H. C.4.3 : Thesis

(5) SPECIALIZATION IN TRANSPORTATION PLANNING

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
TP. C.2.1 : Traffic Engineering
TP. C.2.2 : Public Transport Planning
TP. C.2.3 : Urban Transport Planning
TP. C.2.4 : Highway Planning and Design
TP. C.2.5 : Transport Economics
TP. C.2.6 : Studio

Second Year: Third Semester
Core Subjects
TP. C.3.1 : Transport Infrastructure Design
TP. C.3.2 : Analytical Transport Planning
TP. C.3.3 : Logistics and Freight Distribution
TP. C.3.4 : Traffic Control system and Road Safety
TP. C.3.5 : Studio

Elective Subjects (Select any one)
TP. E.3.1 : Intelligent Transport System
TP. E.3.2 : Advanced Transportation Economics
TP. E.3.3 : Financing Transport system
TP. E.3.4 : Regional Transport Planning
TP. E.3.5 : Pavement Materials and Design

Second Year: Fourth Semester
TP. C.4.1 : Transport Policy, Legislation and Institutional Framework
TP. C.4.2 : Project Formulation and Appraisal
TP. C.4.3 : Thesis

(6) SPECIALIZATION IN INFRASTRUCTURE PLANNING AND MANAGEMENT

First Year: Integrated First Semester
Core Subjects
In. C.1.1 : Planning History and Theory
In. C.1.2 : Socio-economic basis for Planning
In. C.1.3 : Planning Techniques
In. C.1.4 : Infrastructure and Transport Planning
In. C.1.5 : Housing and Environmental Planning
In. C.1.6 : Studio course

First Year: Second Semester
Core Subjects
IPM. C.2.1 : Project Formulation, Appraisal, Monitoring and Evaluation
IPM. C.2.2 : Transport Networks and Terminals
IPM. C.2.3 : Infrastructure Pricing and Financing
IPM. C.2.4 : Infrastructure Development Policies
IPM. C.2.5 : Information Systems for Infrastructure Planning
IPM. C.2.6 : Studio

Second Year: Third Semester
Core Subjects
IPM. C.3.1 : Infrastructure for Regional Development
IPM. C.3.2 : Telecommunications and Information Technology
IPM. C.3.3 : Regional Development Policies
IPM. C.3.4 : Infrastructure Management
IPM. C.3.5 : Planning for Special Areas and Mega Projects
IPM. C.3.6 : Studio

Second Year: Fourth Semester
Core Subjects
IPM. C.4.1 : Infrastructure Management
IPM. C.4.2 : Research Methods and Quantitative Techniques
IPM. C.4.3 : Thesis

Note:
In. stands for Integrated First Semester.
UP. Stands for Urban Planning.
RP. Stands for Regional Planning.
EP. Stands for Environmental Planning.
H. stands for Housing
TP. Stands for Transportation Planning
IPM. Stands for Infrastructure Planning and Management.
C. stands for Core Subjects and E. stands for Elective Subjects.

M. PLAN / M. TECH. (PLANNING) – INTEGRATED FIRST SEMESTER

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Scheme of Examinations

Name of the Subject		Hours Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
Core Subjects						
In. C.1.1 :	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2 :	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3 :	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4 :	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5 :	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6 :	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**

In. stands for Integrated First Semester.
C. stands for Core Subjects and E stands for Elective Subjects.
* L stands for Lectures and T stands for Tutorials or Studio.

M. Plan / M. Tech. (Planning) - Integrated First Semester

In. C.1.1 : PLANNING HISTORY AND THEORY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Evolution of City Building

Relevance of the study of evolution of settlements; Hunter, gatherer, farmer and formation of organized society; Cosmological and other influences, origins and growth of cities, effects of cultural influence on physical form; Human settlements as an expression of civilizations; Basic elements of the city; Concepts of space, time, scale of cities.

Module 2: Planning History

Town planning in ancient India; Medieval, renaissance, industrial and post industrial cities; City as a living spatial entity; Concepts of landmark, axis, orientation; City form as a living space; City as a political statement: New Delhi, Chandigarh, Washington D.C. Brasilia etc; Contribution of individuals to city planning: Lewis Mumford, Patrick Geddes, Peter Hall, etc; Dynamics of the growing city, impact of industrialization and urbanization, metropolis and megalopolis.

Module 3: Definitions and Objectives of Planning

Definitions of town and country planning; Orthodoxies of planning; Goal formulation, objective, scope, limitations; Sustainability and rationality in planning; Components of sustainable urban and regional development.

Module 4: Theories of City Development and Planning Theories

Theories of city development including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories; Land use and land value theory of William Alonso*;* Ebenezer Howard's Garden City Concept; and Green Belt Concept; City as an organism: a physical, social, economic and political entity; Emerging Concepts: global city, inclusive city, safe city, etc.; City of the future and future of the city; Shadow cities, divided cities; Models of planning: Advocacy and Pluralism in Planning; Systems approach to planning: rationalistic and incremental approaches, mixed scanning and middle range planning; Equity planning; Political Economy Model; Types of development plans, plan making process.

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In. C.1.2 : SOCIO - ECONOMIC BASIS FOR PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Nature and Scope of Sociology

Sociological concepts and methods, man and environment relationships; Socio-cultural profile of Indian society and urban transformation; Tradition and modernity in the context of urban and rural settlements; Issues related to caste, age, sex, gender, health safety, and marginalized groups; Displacement, resettlement and rehabilitation due to compulsory land acquisition.

Module 2: Community and Settlements

Social problems of slums and squatters communities, urban and rural social transformation and their impact on social life, safety, security; Crimes in urban areas and their spatial planning implications, social structure and spatial planning; Role of socio-cultural aspects on growth patterns of city and neighbourhood communities; Social planning and policy, and community participation; Marginalization and concepts of inclusive planning, and gender concerns in planning. Settlement Policy: National Commission on Urbanization, Rural Habitat Policy and experiences from developing countries regarding settlement structure, growth and spatial distribution.

Module 3: Elements of Micro and Macro Economics

Concepts of demand, supply, elasticity and consumer markets; concept of revenue costs; Economies of scale, economic and social costs, production and factor market; Different market structures and price determination; market failures, cost-benefit analysis, public sector pricing; Determinants of national income, consumption, investment, inflation, unemployment, capital budgeting, risk and uncertainty, and long-term investment planning.

Module 4: Development Economics and Lessons from Indian Experiences

Economic growth and development, quality of life; Human development index, poverty and income distribution, employment and livelihood; Economic principles in land use planning; Policies and strategies in economic planning, balanced versus unbalanced growth, public sector dominance; changing economic policies, implications on land.

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In.C.1.3 : PLANNING TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Survey Techniques and Mapping

Data base for physical surveys including land use, building use, density, building age, etc., and socio-economic surveys; Survey techniques; Land use classification or coding and expected outputs; Techniques of preparing base maps including understanding the concepts of scales, components and detailing for various levels of plans like regional plan, city plan, zoning plan, and local area plan.

Module 2: Analytical Methods

Classification of regions, delineation techniques of various types of regions, analysis of structure of nodes, hierarchy, nesting and rank size; Scalogram, sociogram, etc.; Planning balance sheet; Threshold analysis; Input output analysis, SWOT analysis;

Module 3: Demographic Methods

Methods of population forecasts and projections; Lorenz Curve, Ginni Ratio, Theil's index, rations: urban – rural, urban concentration, metropolitan concentration; Location dimensions of population groups – social area and strategic choice approach – inter connected decision area analysis.

Module 4: Planning Standards

Spatial standards, performance standards and benchmarks, and variable standards; UDPFI guidelines, zoning regulations and development control rules and regulations.

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In.C.1.4 : INFRASTRUCTURE AND TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Role of Infrastructure in Development

Elements of Infrastructure (physical, social, utilities and services); Basic definitions, concepts, significance and importance; Data required for provision and planning of urban networks and services; Resource analysis, provision of infrastructure, and land requirements; Principles of resource distribution in space; Types, hierarchical distribution of facilities, Access to facilities, provision and location criteria, Norms and standards, etc.

Module 2: Planning and Management of Water, Sanitation and Storm Water

Water – sources of water, treatment and storage, transportation and distribution, quality, networks, distribution losses, water harvesting, recycling and reuse, norms and standards of provision, institutional arrangements, planning provisions and management issues; Sanitation – points of generation, collection, treatment, disposal, norms and standards, grey water disposal, DEWATS, institutional arrangements, planning provisions and management issues.

Storm water – rainfall data interpretation, points of water stagnation, system of natural drains, surface topography and soil characteristics, ground water replenishment, storm water collection and disposal, norms and standards, institutional arrangements, planning provisions and management issues;

Module 3: Planning and Management of Municipal Wastes, Power and Fire

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

Power – Sources of power procurement, distribution networks, demand assessment, norms and standards, planning provisions and management issues. Fire – History of fire hazards, vulnerable locations, methods of fire fighting, norms and standards, planning provisions and management issues.

Module 4: City Development and Transport Infrastructure Planning, Management and Design

Role of transport, types of transport systems, evolution of transport modes, transport problems and mobility issues**;** Urban form and Transport patterns, land use – transport cycle, concept of accessibility; Hierarchy, capacity and geometric design elements of roads and intersections**;** Basic principles of Transport infrastructure design; Traffic and transportation surveys and studies, traffic and travel characteristics; Urban transport planning process – stages, study area, zoning, data base, concept of trip generation Transport, environment and safety issues; principles and approaches of traffic management, transport system management.

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In.C.1.5 : HOUSING AND ENVIRONMENTAL PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concepts and Definitions

Shelter as a basic requirement, determinants of housing form, Census of India definitions, Introduction to policies, housing need, demand and supply, dilapidation, structural conditions, materials of constructions, housing age, occupancy rate, crowding, housing shortage, income and affordability, poverty and slums, houseless population

Various housing typologies viz. traditional houses, plotted development, group housing, multi-storied housing, villas, *chawls*, etc., slums and squatters, night shelters, public health issues related to housing, various theories of housing, concept of green housing, green rating of housing projects.

Module 2: Social and Economic Dimensions

Housing as social security, role of housing in development of family and community well being, status and prestige related to housing, safety, crime and insecurity, deprivation and social vulnerability, ghettoism, gender issues, housing for the elderly.

Contribution of housing to micro and macro economy, contribution to national wealth and GDP, housing taxation, national budgets, fiscal concessions, forward and backward linkages.

Module 3: Housing and the City

Understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions; Suitability of land for housing, housing stress identification, projecting housing requirements, calculating housing shortages, housing allocation.

Module 4: Planning for Neighbourhoods

Approaches to neighbourhood living in traditional and contemporary societies, elements of neighbourhood structure, Planning and design criteria for modern neighbourhoods, norms and criteria for area distribution, housing and area planning standards, net residential density and gross residential density, development controls and building byelaws, UDPFI guidelines, NBC 2005 provisions and Case studies of neighbourhood planning.

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In.C.1.6 : STUDIO COURSE

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	--
Internal Assessment	100
Total Marks	100

The studio program is divided into two parts. The first part involves learning of basic techniques such as GIS applications, remote sensing and statistical applications. The second part contains a number of plan preparation assignments.

Module 1: GIS Applications

Coordinate system and geo-coding, vector data structure and algorithms, raster data structure and algorithms, data bases for GIS – concepts, error modeling and data uncertainty, decision making through GIS, constructing spatial data infrastructure and spatial information system; National Urban Information system.

Module 2: Remote Sensing

Why remote sensing, aerial and satellite remote sensing, principles of aerial remote sensing, Aerial photo-interpretation, photogrammetry, stereovision, measurement of heights / depths by relief displacement and parallax displacement. Principles of satellite remote sensing, spatial, spectral, temporal resolutions. Applications in planning, population estimation, identification of squatter / unauthorized areas, sources of pollution, etc., spatial resolution related to level of Planning

Module 3: Demography

Sources of demographic data in India, Settlement type, growth pattern and structure: urban settlement analysis, Concentration: spatial, vertical and size, peri-urban sprawl, economic base; Rural Settlements – Size, occurrence and character, transformation, Policies towards various size class settlements.

Population structure and composition – Age, sex, gender, marital status, caste, religion, literacy level, etc.; Age - sex ratio, structure, pyramid; dependency ratio; occupational structure; Fertility; mortality, migration analysis, natural growth of population, migration and its implications in spatial planning;

Module 4: Statistical Applications

General concepts - statistical interference, population and samples variables, Sampling, simple statistical models, Measures of central Tendency, Measures of Dispersion, Measures of shape of distribution, Correlation and regression

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STUDIO ASSIGNMENTS

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

First Assignment

Film Appreciation (individual assignment)

Films related to city development and socio-economic issues will be screened for students. The purpose of these films is to educate the students' understanding of various development issues and to absorb them in the planning practice. At the end of the film, a discourse around the film will also be held.

After viewing the films, each student is expected to write about its main focus, city / region context, its applicability to Indian environment by answering the given questions in not more than half a page.

Second Assignment

Literature Review (individual assignment)

Each student is expected to read the article given from a journal/book and write a summary of not more than a page (250 words only) highlighting the problem, approach, methodology, analysis, how the author arrived at the conclusion and its relevance to Indian context. There will be a negative marking for writing the same text as in the original (that is copying from the original text given to them).

Third Assignment

Area Appreciation (individual assignment)

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

Due to the size of the area, this exercise is done in groups of students being assigned to a particular area.

The following planning issues at area level should be identified:

- Review of the Master Plan / Zonal / Area plan in relation to the selected areas.
- Appreciation / Analysis of ward level data.
- Perception of areas in terms of legal / illegal / authorized / unauthorized, Slums, Urban Aesthetics.
- Social Categorizations of people - Type of population living, people's perception about area and its planning problems.

- Land use including Agriculture land and land use conflicts, extent (%) of broad land use such as commercial, industrial, residential, institutional and recreational.
- Extent of formal / informal activities present in the area including their location and conflicts.
- General land tenure of the area and land value for different uses.
- Major types of transport, type of roads, hierarchy of roads, type of transport modes used.
- Amenities: Location of Social and Physical infrastructure and their problems as perceived by local population. Look for specific infrastructure such as Water supply, drainage (water logging areas), waste collection and disposal system, sanitation, etc.
- Environmental Issues: Open Spaces – Availability and extent of open space to built-up area, garbage disposal, encroachment (through photographic evidences and sketches).
- Locating the study area in the zone, city and regional context with respect to all the above aspects.

Fourth Assignment

Site Planning (individual assignment)

Site planning is a process whereby the optimum utilization of potential of site is considered recognizing the constraints the site has. It uses 3 dimensional space of the site and the associated locational advantages, human activities and the regulations that are assigned to a particular site.

The site is developed using a set of standards / norms in a given context which varies from location to location. A student is expected to understand the intricacies and interface between various variables such as soil conditions, topography, environmental dimensions, location, spatial standards applicable to the site, etc.

Fifth Assignment

City Development Plan (Group assignment)

A City is a multi-dimensional, dynamic and a futuristic space. Understanding city involves appreciating this multi direction, and include them in the city making process. A job of physical planner does not merely understand the current conflict in development but to emerge out of this and to come out with a vision for the city. To arrive at this vision, a planner needs to understand the dynamics of various components of the city and how and what level interventions can be made to achieve that vision.

A group of students are expected to study a city in terms its present problems and issues and project a futuristic vision in terms of scenario building.

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M. PLAN / M. TECH. (PLANNING) – SPECIALIZATION IN URBAN PLANNING

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Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3 + 0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
UP.C.2.1	City and Metropolitan Planning	2 + 1	2	50	50	100
UP.C.2.2	Infrastructure Planning	2 + 1	2	50	50	100
UP.C.2.3	Urban Heritage Conservation	2 + 1	2	50	50	100
UP.C.2.4	Advanced Planning Techniques	2 + 1	2	50	50	100
Elective Subjects (Select any one)						
UP.E.2.1	Inclusive Urban Planning	2 + 1	2	50	50	100
UP.E.2.2	Planning for Tourism					
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
UP.C.2.5	**Studio**					
	Project I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Project II: Development Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 13**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
UP.C.3.1	Urban Development Management	2 + 1	2	50	50	100
UP.C.3.2	Project Planning and Management	2 + 1	2	50	50	100
UP.C.3.3	Urban Governance	2 + 1	2	50	50	100
UP.C.3.4	Politics and Planning	2 + 1	2	50	50	100
Elective Subjects ((Select any one)						
UP.E.3.1	Environment, Development and Disaster Management	2 + 1	2	50	50	100
UP.E.3.2	Energy, Climate Change and Urban Development					
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

UP.C.3.5	**Studio**					
	Project I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Project II: Management and Governance Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
UP.C.4.1	Development Finance	2 + 1	2	50	50	100
UP.C.4.2	Legal Issues and Professional Practice	2 + 1	2	50	50	100
UP.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**40 + 80**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

* L stands for Lectures and T stands for Tutorials or Studio.

** All students are required to undertake internship after Second Semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate satisfactory performance.

M. Plan / M. Tech. (Planning) - Specialization in Urban Planning

SECOND SEMESTER

UP.C.2.1 : CITY AND METROPOLITAN PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Urban Growth and System of Cities

Growth of cities scale, complexity and its impact on national development, cities as engines of growth, cities as ecosystems, resources in cities.

Module 2: City – Region Linkages

City, fringe and the periphery - physical and functional linkages, peri-urban development.

Module 3: Metro and Mega Cities: Problems and Issues

Growth trends and processes, characteristics, problems, concepts and concerns of urban sustainability, issues related to diversity and unintended growth, economic, social and environmental sustainability, quality of life, inclusivity and equity, climate change, transit oriented development, participatory planning. Inner city – issues and problems, approach to development.

Module 4: Human Settlement Planning, Urban Development Policies and Programmes

Concepts, approaches, strategies and tools; Policies and programmes at various levels, impact on metro and mega city development.

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UP.C.2.2 : INFRASTRUCTURE PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Water Supply and Sanitation

Quantity and quality, source of supply, transmission and distribution, treatment methods, design guidelines.
Sanitation – concepts, disposal systems, low cost sanitation options; engineering aspects of sewage disposal;
Wastewater – generation, disposal system
Storm water drainage – systems

Module 2: Solid Waste Disposal and Management

Basic principles, generation, characteristics, collection, disposal, management.

Module 3: **Fire and Electrification, and Social Infrastructure**

Planning for fire protection, services and space standards, location criteria; Planning for Education, health, civic, cultural infrastructure

Module 4: Traffic and Transportation

Planning for infrastructure and facilities for transport

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UP.C.2.3 : URBAN HERITAGE CONSERVATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Urban Heritage

Typology / classification, inventories, mapping; Human habitation in historical context; Heritage as a motivating force in sustainable urban conservation and development,

Module 2: Heritage Conservation

Natural heritage conservation - typologies, policies for conservation, regulatory measures, community participation; Concept of Historic Urban Landscapes; Built heritage conservation - determinants of built form on heritage; Historic urban infrastructure and traditional water harvesting systems. Integration of historic monuments / areas / cores / urban systems in the developmental process and land use, regulatory measures and community involvement; Intangible cultural heritage and development: issues, conservation strategies. Preparation of conservation and heritage management plans.

Module 3: Heritage and Tourism, Policies and Programmes, Legislation

Cultural and heritage based tourism - nature, potential and prospects, marketing aspects; Acts and laws recognizing conservation / regeneration; Heritage toolkit; Implications of 74th Constitution Amendment Act.

Module 4: Design in Human Habitation

Social / cultural / ecological / energy determinants of design; Imagibility 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.

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UP.C.2.4 : ADVANCED PLANNING TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Survey Techniques

Data Base for Physical surveys (including land use / building use / density / building age, etc.) and Socio-economic surveys; Questionnaire formulation, Sampling and survey techniques, etc. Land use classification / coding.

Module 2: GIS Mapping

Coordinate system, Georeferencing and geo-coding; GIS data processing (Digitization, topology building and metadata creation), Data structures and modeling, GIS analysis (Buffer, proximity and overlay), Decision making through GIS, Information systems (Land Information system, Urban Information system for various activity sectors).

Module 3: Research Design and implementation

Approaches in research, developing a method for research; Questionnaire Design, Types of data, sampling methods; developing aims, objectives, scope, limitations; and literature research – using library, accessing the Internet

Module 4: Analytical Techniques, Presentation and Report Writing

Data tabulation; Interpretation of information; Graphical presentation of data; Spatial representation of data; Types of reports with specific focus on technical report writing; Organizing the report, structure chapter organization, Writing the report (analytical findings); Referencing in text, use of software in referencing

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UP.E.2.1 : ELECTIVES (SELECT ANY ONE)

INCLUSIVE URBAN PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Understanding Inclusive Planning

Definitions and components

Module 2: Stakeholders Profile and Needs, Access to Shelter, Services and Livelihoods

Urban Poor, Informal Sector, Gender, Children, Elderly, Disabled, Displaced people, etc.; Slums - dimensions, causative factors, determinants, location characteristics of settlements; Informal sector - growth, characteristics, functions, economic contributions, linkages with formal sector, impact on Urban Development

Module 3: Participatory Planning Process and Policies, Programmes and Legislation

Methods, role of stakeholders (including civil society organizations), etc.; Related Acts, Five year plans, policies and programmes at various levels.

Module 4: Planning interventions

Inclusive zoning, development and building regulations, Slum Improvement.

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UP.E.2.2 : PLANNING FOR TOURISM

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Tourism

Definitions, scope, nature, classification and dimension, tourism as an industry, tourism in developed and developing world.

Module 2: Tourism Sector – impacts

Relationship between Tourism and Urban Development, Tourism multiplier and forecasting methods: capacity building and carrying capacity planning for tourism projects, tourism and cultural and social change: Socio-cultural problems, environmental degradation.

Module 3: Planning for Tourism

Nature and scope of a tourism plan- key issues and stages, data requirements, surveys, role of key players / stake holders in tourism policy and planning, sustainable tourism development planning; community planning and tourism; implementation and management, role of travel and tourism promoting agencies, monitoring the tourism development; Tourism marketing - concept, techniques and strategies.

Module 4: Policies and Programmes

Tourism policies at various levels.

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UP.C.2.5 : STUDIO

Studio Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Project I: Geo-Informatics Laboratory Training

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Introduction to Geo-informatics, introduction to Remote Sensing – Aerial and Satellite; introduction to GIS, Spatial data and Attribute data; Satellite images as input to GIS; Collection and presentation of baseline information.

(b) Project II: Development Plan

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The first studio exercise focuses on the planning, development and design aspect (in line with the other core and elective courses offered in the semester). The exercise pertains to large cities and emerging metropolitan cities and ranges from preparation of sustainable development plans to sector specific themes pertaining to tourism, SEZs, etc. The studio exercise enables them to develop an approach/ framework for the task; it is field based as a database is generated that is analyzed and the plan and strategies are formulated.

Initial study involves understanding of the exercise through theories, study of similar case studies, awareness of relevant norms and standards through extensive literature search. Students are required to prepare a comprehensive list of required data and identify probable sources before making a field visit to the case study town/city. Students are encouraged to translate learning from the core and elective subjects to the studio exercise. The introduction of GIS in the studio enables them to apply it in the studio exercise. Students are expected to analyze the data collected and come out with proposals and recommendations for planned development of the city. The entire exercise is also documented in the form of a technical report.

The second exercise is a short and intensive exercise of one-month duration. It pertains to topical issues i.e. property tax reforms, informal sector, development of railway land, etc. The study is based on primary surveys and students are expected to analyze the information and arrive at recommendations.

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THIRD SEMESTER

UP.C.3.1 : URBAN DEVELOPMENT MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Development Management

Concept, approaches, components, interface with national goals and political economic system.

Module 2: Urban Development Management

Strategies, Tools and Techniques; organizations involved

Module 3: Land 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 4: Information System and Urban Reforms

Spatial and Non - spatial information systems; Urban reforms and acts and policies.

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UP.C.3.2 : PROJECT PLANNING AND MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Project planning

Introduction to Projects; Nature of planning projects; Project Life Cycle; Identification of projects

Module 2: Project Formulation and Appraisal

Relationship between projects and planning issues including sectoral policy at: Local, State and National levels Project appraisal: Market analysis – Macro environment survey, survey methods, market characterization, demand forecasting; Technical Analysis – Magnitude, processes, materials, equipment, factors of production availability, implementation schedule; suitability of the plans, layout and design, location of the project; location analysis; supporting infrastructure requirements- Capital Budgeting – Estimation of costing of components; developing over project cost; Social cost benefit analysis – UNIDO, Merles, ZOPP/GOPP, etc

Module 3: Project Management and Implementation, and Project Evaluation and Monitoring

Project characteristics - pitfalls in management of a project; Techniques of management; Planning milestones - responsibility charts and principle responsibility, principles of activity planning; Project Implementation – methods, hurdles, facilitative factors; Project culture: line management, steering committee, role of project manager; Project Control: cost and time, quality - ISI standards and its application to Indian context; Introduction to Project Management Software (Ms Projects) and its usage. Types of evaluation - concurrent, ex-ante and ex-post. Methods of evaluation, techniques of evaluation, end results, Presentation of evaluation findings, Techniques of Monitoring of Development Works.

Module 4: Regulatory Frameworks Governing Projects

National Rehabilitation and Resettlement Policy (2007) - Social Impact mitigation; National Environmental Policy (2006) – Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)

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UP.C.3.3 : URBAN GOVERNANCE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Urban Governance

Definition, concepts, components, government and governance, hierarchy and structure, forms of governance, process of inclusion and exclusion,

Module 2: Legislations pertaining to Urban Governance

Institutional frame and mechanism for urban governance as envisaged in the 73rd and 74th Constitution Amendment Acts.

Module 3: Institutions and Organizations

Differences between institutions and organizations; approaches to understanding organizations; types, structure and functions, their interface and conflicts, reach, and their effectiveness; Methods, process and evaluation; Present organizations and involved in urban governance.

Module 4: Urban Local Governance and Participatory Processes

System, structure, functions, powers, process and resource, performance, interface with NGO's, other agencies. Stakeholders' participation, roles and responsibilities, access to government by various stakeholders.

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UP.C.3.4 : POLITICS AND PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Interface between Politics and Planning

Social and economic context; State in India – political culture of the Indian State – Centre – State – Local political economy: 74th Constitution Amendment Act, State Finance Commissions; Emergence of the State in the federal set up.

Module 2: City and the State

State as a manager of resources – property rights, norms and standards – Government market and market by Government – Regulatory State, Reforming State, and Rent Seeking State – their spatial implications; Development planning and the Indian state – Centralization, powerlessness and decentralization; spatial politics and competition; Politics of the State and bureaucracy; New State spaces, invited and contested spaces – changing role of the state

Module 3: Politics related to Planning and Development

Politics related to land, shelter, urban infrastructure, resources; Regeneration and redevelopment politics; politics of provision, financing and pricing; decision-making and decision taking

Module 4: Politics and Civil Society

Politics and emergence of civil society – NGO, CBO and their role in planning, development and management, collective bargaining and collective action

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ELECTIVES (SELECT ANY ONE)

UP.E.3.1 : ENVIRONMENT, DEVELOPMENT AND DISASTER MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Environment, Development and Disaster Management – Interface

Resource use, exploitation and conservation; Impact of human activities on environment; Environment and economy interaction, introduction to environmental accounting.

Module 2: Environmental Management

Environmental Impact Assessment, thresholds, indicators, audits, environmental certification, lifecycle analysis, environment and poverty links, environmental policy, Acts and regulations; Environmental education, participatory approaches, emerging concepts. Disaster classification, concepts, hazards, vulnerability, risks, human response to disaster, impacts

Module 3: Disaster Mitigation and Management

Relevance of disaster management in development and environment, disaster preparedness, prevention, displacement and development, Role and responsibilities of government and non–government organizations, Disaster Education – awareness of individuals, communities and participation at various levels; Integrating disaster mitigation in the spatial planning process, provision of infrastructure for disaster mitigation.

Module 4: Policies and Legislation Pertaining to Environment and Disaster Management

Policies and Legislation at various levels.

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UP.E.3.2 : ENERGY, CLIMATE CHANGE AND URBAN DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Energy, Climate change and Urban Development – Interface.

Module 2: Energy Generation and Consumption.

Energy Supply and Demand, Energy Consumption in cities, determinants of energy demand, phenomenon of climate change, factors influencing climate change, impacts of climate change

Module 3: Energy Planning and Management, and Mitigation and Adaptation to Climate Change.

Energy efficient development, Compact city form, Transit oriented development. Mechanisms and measures for mitigating and adapting to climate change at various levels

Module 4: Plans, Policies and Strategies.

Related to energy planning, conservation, climate change mitigation and adaptation.

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UP.C.3.5 : STUDIO

Studio Hours Per Week	(L) 0+ (T) 15*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Project I: Geo-Informatics Laboratory Training

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Introduction to Geo-informatics, introduction to Remote Sensing – Aerial and Satellite; introduction to GIS, Spatial data and Attribute data; Satellite images as input to GIS; Collection and presentation of baseline information.

(b) Management and Governance Plans

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	10
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The focus of the studio is on management and governance aspects (in line with the other core and elective courses offered in the semester). The exercise pertains to metropolitan cities and mega cities and ranges from preparing management plans and projects related to various sectors pertaining to infrastructure, disaster risk, riverfront development etc. Students are also required to identify and formulate projects, work out the appraisals and do the feasibility, viability and implementation mechanisms of the projects. Students work on a case study town/city and have to visit the field for collection of data and interaction with city officials and stakeholders. Although planning continues to be an important aspect of the exercise, students are also exposed to project identification, formulation, and appraisal, financing mechanisms and institutional framework. Students draw from the theoretical knowledge provided in the core and elective subjects related to management, finance and governance offered in the semester and translate them in their studio exercise. The culmination of the exercise is in the form of group presentations and studio report.

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FOURTH SEMESTER

UP.C.4.1 : DEVELOPMENT FINANCE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Development Finance

Approaches, concepts, components, process, credit rating.

Module 2: State Finance

Finance Commissions, functions, relationship between Central, State and Urban Local Government.

Module 3: Municipal Finance

Urban reform incentive fund, Sources of revenues; Equities; Loans; Debt financing; City challenge fund, Pooled finance development fund, National urban infrastructure fund, Municipal Bonds, Miscellaneous sources; Structure of finances, fiscal problems and issues of financial management, implications of 74^{th} Constitution Amendment Act for municipal finance, expenditure pattern, Bilateral and multi lateral lending intuitions mobilizing resources for a project - financial resources, land resources, project resources, and other resources.

Module 4: Investment Planning and Financing Mechanism

Link with spatial plans, process, components, investment needs, budgeting, financial investments in infrastructure and services. Financing of urban development, infrastructure and services – mechanisms and instruments, subsidy reduction, cost recovery, public private partnerships; Financial appraisal, investment appraisal; Financial Risk – Sources, Measures and perspectives on risk, Sensitivity analysis.

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UP.C.4.2 : LEGAL ISSUES AND PROFESSIONAL PRACTICE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Interface between policy and legislation pertaining to urban development.

Module 2: Understanding of Law

Concepts, sources, terminologies, significance of law and its relationship to Urban Planning benefits of statutory backing for schemes - eminent domain and police powers; Indian Constitution: concept and contents; 73rd and 74th Constitution Amendment Act, provision regarding property rights.

Module 3: Planning Legislation and Policy Formulation and Appraisal

Evolution; An over view of legal tools connected with Urban Planning and Development, Town and Country Planning Act, 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, planning and development organizations, land resources, environment protection, and public participation in statutory planning process; Approaches of formulation of policies, appraisal of policies.

Module 4: Professional Practice

Aims and objectives of professional Institutes, sister bodies, professional role and responsibility of planning consultants, professional ethics, code of conduct and scale of professional charges; Formulation of project proposal and outlines, consultancy agreements and contracts, managerial aspects; Role in inter disciplinary groups: Appreciation of the decision-making processes and the process in relation to varied consultancy assignments of planning.

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UP.C.4.3 : THESIS

Lecture Hours Per Week	(L) 0+ (T) 24*
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

The students are required to carry out independent research and prepare a thesis on a topic on urban planning selected by them and approved the faculty under the supervision of a research guide allocated by the department.

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M. PLAN / M. TECH. (PLANNING) – SPECIALIZATION IN REGIONAL PLANNING

5

Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
RP.C.2.1	Planning for Regions	2 + 1	2	50	50	100
RP.C.2.2	Infrastructure Management	2 + 1	2	50	50	100
RP.C.2.3	District Planning and Rural Development	2 + 1	2	50	50	100
RP.C.2.4	Land Markets and Management	2 + 1	2	50	50	100
RP.C.2.5	Poverty and Development	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
RP.C.2.6	**Studio**					
	Module I: Applied GIS and Spatial Data Infrastructure	3 + 0	2	50	50	100
	Module II: Block or Tehsil Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
RP.C.3.1	Environment and Development	2 + 1	2	50	50	100
RP.C.3.2	Project Planning	2 + 1	2	50	50	100
RP.C.3.3	Institutional Analysis and Governance	2 + 1	2	50	50	100
RP.C.3.4	Politics and Public Policy	2 + 1	2	50	50	100
RP.C.3.5	Resettlement and Rehabilitation	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

RP.C.3.6	**Studio**					
	Module I: Spatial Data Infrastructure	3 + 0	2	50	50	100
	Module II: District Planning / Regional Planning	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
RP.C.4.1	Financing Development	2 + 1	2	50	50	100
RP.C.4.2	Legal Issues in Planning	2 + 1	2	50	50	100
RP.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**42 + 78**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

* L stands for Lectures and T stands for Tutorials or Studio.

** All students are required to undertake internship after second semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate satisfactory performance.

M. Plan / M. Tech. (Planning) - Specialization in Regional Planning

SECOND SEMESTER

RP.C.2.1 : PLANNING FOR REGIONS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concepts and Typology of Regions and Regional Dynamics

Basic Concepts in Regions, Defining a region: fluidity and purposiveness, Typology of Regions: Resource Regions, Mega, Macro, Meso, and Micro Regions; Regional Dynamics: Growth of Mega and Metro Regions: Scale, Complexity and its impact on national and international scenario, convergence and divergence. Regional Economy, competitiveness among regions, backward and leading regions in development; Special Regions: SEZ, Agro Regions, Ecological regions, etc.

Module 2: Regions in India and Its Planning

Regions in Indian Context: Resource Regions, Corridors as regions, National, sub-national and State as a region, macro, meso and micro regions in India. Case Studies from India: NCR and Delhi Mega Region, Mumbai Mega Region, Kolkata Metro Region, Chennai Metro Region, and other Metro Regions in India.

Module 3: Resource Regions in India

Western and Eastern Ghats, North Eastern Region, Coastal Regions, and River Valley Regions; Corridors: Golden Quadrilateral, Delhi-Mumbai, Chennai-Bangalore Industrial Corridor, North-South and East-West Corridor Regions.

Module 4: Core and Periphery in a Region in Indian Context

Core, Fringe and Periphery in a Region and its planning; Tools and techniques available for planning regions in India; Role of 73rd and 74th Constitution Amendment Acts in regional plan preparation and implementation.

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RP.C.2.2 : INFRASTRUCTURE MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Infrastructure Planning and Importance of Regional Infrastructure

Equity, Access, level and Efficiency, Quality of Service, Paying Capacity, Pricing of Infrastructure Services; Ownership and Control: Public, Private, SPV, and PPP Models in infrastructure provision, Multi-service providers and their operation at various levels. Infrastructure Policy: Regulatory and Facilitative, Investment Requirement at various levels and actual investments in Infrastructure; Role of Infrastructure in regional development, Critical Infrastructure in regional development, and Indicators of infrastructure development in defining regional development, standards and bench marks for infrastructure provision and delivery at various levels; Role of Spatial Information Technology (SDI) in the planning, provision, and monitoring infrastructure.

Module 2: Water

Introduction: Sources of water, current scenario: Conflicts and Co-operation – Trans boundary water conflicts: inter-state, international water treaties, National Water Policy, Water Rights: Excess and under utilization of water. Access standards, demand and supply analysis, pricing parameters, conservation issues, technology: extraction, cleansing, recycling and reuse. Pollutions associated with water. Institutions in Water provision: PPP, SPV in water. Role of Community in water provision. Conflicting use of water: Agriculture vs. Water harvesting; Water for Irrigation: Source, Access, Trans-boundary conflicts and co-operation, pricing, demand and supply conditions. Regulatory and Facilitative policies, Investments in Irrigation: Minor, Major irrigation and issues related to these. Technology in irrigation (systems); equity, efficiency and pricing issues in irrigation; Drinking / Potable Water: Source, provision at various levels (Village, City and District) equity, efficiency, leakages and unaccounted water and its minimization. Privatization of Water and its implications. Pricing and access. Spatial variations in standards and provisions.

Module 3: Sanitation and Solid Waste Management

Policies and Programmes in the provision of Sanitation at various levels: Rajiv Gandhi Technology Mission on Water supply and Sanitation (Rural), City Sanitation Plan, and State Sanitation Strategies; Sanitation and MDG, Resource Commitment for Sanitation. Access to Sanitation: Cost and Coverage, role of institutions: Public, Private, PPP, community involvement; Sanitation and environment, Sanitation and health; Wastes in Rural Areas: types of waste, Problems and reuse; community involvement in collection, treatment and reuse. Wastes in Urban areas: collection and disposal, technological innovations, formal and informal institutions in waste collection. Role of ULBs, NGOs, informal networks, rag-pickers, Solid waste as an economy issue, cost recovery in solid waste.

Module 4: Regional Roads and Energy

Hierarchy of Roads: National, State, District, Other District Roads, and Village Roads: standards, provision and institutions involved. Investment, pricing and maintenance; Access, Coverage and conditions; National, State and District Policies towards Roads; National Highway Project: Golden Quadrilateral, North-South and East-West Corridors and its impact on regional space, PMGSY and its impact on village connectivity. BRDO: border roads and backward regions; Forward and Backward regions in terms of road provision; Conventional and Alternative Energy Sources and Policies and programmes towards energy at various levels. Demand and Supply projections, investment and pricing; Trans-boundary issues in production, sharing; privatization issues. Nuclear Energy: issues involved and probable spatial impact.

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RP.C.2.3 : DISTRICT PLANNING AND RURAL DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Decentralized Planning in India – Historical perspective: Current Scenario – Recent Development in decentralized district level planning. 73rd and 74th Constitution Amendment Acts, Participative District Planning; Role of Planning Commission and Finance Commissions, and ICT in District Planning.

Module 2: District Planning

Data Management and District Level Visioning, Institutional and other support for District Planning Committee, Bridging gap through district planning, resource mapping and determination of funding sources, consolidation of urban and rural plans; Multi-Sector and multi-level integrated approach to planning (vertical and horizontal spatial integration); Rural-Urban spatial relationship; District Development Plans – Guidelines for District Planning: Content and context and methodologies, Village Development Plans – an Integrated approach, rural norms and standards (spatial). Capacity Building for Decentralized Planning; Democratizing Information: using media for district development.

Module 3: Rural Development - I

Introduction: Meaning and Scope and overview of rural development: Historical perspective – Rural Development Programmes in India. Problem / perception and identification; Rural Area Planning – Programmes / Policies / Schemes for rural development, their coverage and outcomes; Rural Infrastructure Development: Bharat Nirman – A business plan for rural infrastructure, Rural Building Centers, PMGSY, IAY, Rajiv Gandhi Technology Mission, Central Rural Sanitation Programme, PURA. Rural Employment Schemes: Mahatma Gandhi National Rural Employment Guarantee Act, 2005, *Sampoorna Grameen Yojana*, National Food for work programme, *Swarna Jayanty Gram Swarozgar yojana,* National Social Assistance Programme. Programmes: Command Area Programme, Drought Prone Area Programme, Backward Area Development Programme, North Eastern Development Programme. Technology Missions: Water, Sanitation, etc.

Module 4: Rural Development - II

Changing Profile of the Rural areas of India: Consumption pattern changes, land utilization changes, cropping pattern changes, holding size change, living standard changes, changes in asset ownership – its implication in the planning process; Rural Settlement Analysis: Types, activity, environment and economic interface in rural habitat, technology in rural settlement; Land Utilization: Types of land utilization and its relevance to planning; Land conversions and its regulation / facilitation in peri-urban areas; Land utilization analysis; Common property and its use, tenancy and ownership, holding size and its relevance, irrigated and non-irrigated and land values; Sources of information for land information; Technology in Rural Development: ICT in rural development, Rural Information system, Weather forecasting, disaster minimization, market information, etc. E-Panchayats, energy efficient technologies and alternative technologies; Inclusive Development: Special Component Plan - Tribal Sub Plan and Weaker Sector Plan allocation, implementation, monitoring and evaluation; North Eastern Plan.

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RP.C.2.4 : LAND MARKETS AND MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Land Economics, Land Policy and Land Markets

Economic Principles of Land use, Concept of Rent and its application. Demand forecasting for land, factors affecting land supply and demand; Market Conditions – formal and informal, legal and illegal; Instruments of land policy and impact on markets: Planning instruments, market development instruments, financial development instruments, fiscal instruments, and other supportive instruments: Market by Government and Government by Markets: Regulation, monopoly power and its use, private development, rent-seeking and its impact on land supply, access to land by various segments of population, and PPP in land.

Module 2: Supply Side Management

Property Rights: ownership, user and exchange rights: Its implication on land supply, Land Development: Type, cost, methods of disposal. Corruption and land markets: Corruption, black money and land markets; Relation between land, share and gold markets.

Regulation in Land Markets: Social justice and land distribution: public domain, social-democratic regulation and corporatist regulation, collective action of the state and regulation of its supply of land – overall impact of regulation on land prices: Master Plan, Zoning and other planning regulations and their impact on supply.

Land Management Techniques: Private land assembly, co-operatives in land development, FDI in land development, land pooling and plot reconstitution, Transfer of development rights, land sharing and land lease.

Module 3: Demand Side Management

Income elasticity of land, business cycles and its impact on demand for land, externalities and internalities in land development and induced demand, economic growth and demand for land; Changes in tastes and preferences and its effect on type of land; Poor and their demand; Physical, fiscal, financial and legal incentives for inducing or restricting the demand for land; Mega investments and its effect on land.

Module 4: Land Pricing and **Real Estate Markets**

Land valuation techniques, land pricing, subsidies, auctions; type of development: plotted, flatted system, and their effect on land pricing. Hedonistic pricing, land price behavior in urban centers; constructing the land price index; Market Conditions – real estate cycles, market efficiency, market forecasting, Cartels, collusion, and rent seekers in real estate market, agents in real estate markets, risks; Real estate regulatory bill and its likely impact.

Land Information System (LIS): Land records in rural areas (examples from Karnataka, Andhra, etc), transparency in land transaction, methods of publicizing land prices and land price monitoring.

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UP.C.2.5 : POVERTY AND DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Understanding Poverty

Definition, concept of poverty, new definitions of poverty and its likely impact: relative poverty, absolute poverty, over all poverty, extreme poverty, physical poverty, income poverty, rural and urban poverty; poverty data base in India, data sources used for estimating poverty in India (household surveys and household consumption surveys); Globalization of poverty.

Module 2: Measures of Poverty

Evolution of poverty line, consumption expenditure data: per capita consumer expenditure, distribution of expenditure; source of Data: National Sample Survey (NSS), National Accounts Statistics, identification of poor; how identification is done in India, food and land as a substitute, slum centric views and other methods. Approaches: livelihood approach, consumption based approaches, etc.

Module 3: Indicators of Poverty

Methodology: Poverty Lines, Rural and urban poverty lines, national poverty lines, poverty ratio, sub-national indicators: MDG indicators, income and non-income indicators (Education and health, etc); Quality of life indicators, empowerment indicators, gender indicators, and human development indicators.

Module 4: Rural and Urban Poverty

Over view: incidence and dynamics of rural poverty: causes of rural poverty: dimensions of rural poverty, estimates of rural poverty in india, issues related to rural poverty; reviews of development strategies of past decade, ways to overcome the risk and reducing their vulnerability to climate change – double effect of poverty and vulnerability to risks; Spatial targeting of poverty; Government programmes; Multi-dimensional aspects of poverty, urban poverty matrix, vulnerability and asset ownership, Informal sector and poverty, role of National Commission for enterprises in the organized sector (NCEUS), Programmes to address the poverty issues: policy based (tenure regularization), sector based (slum up gradation, access to housing), finance based (Micro finance, compulsory municipal fund allocation); Monitoring and Evaluation of anti-poverty programmes. Best Practices in poverty alleviation across the global.

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RP.C.2.6 : STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Application of GIS and SDI in Planning

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

In this module, the students will be trained in the aspects of GIS and SDI that includes digitization, 3D modeling, overlays, interface with statistical packages into GIS and how to use them. This will be applied to the studio project and the students will be required to do all their analyses at various levels based on the data collected from the field.

(b) Block or Taluka Planning

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

Block or Taluka Planning has been practiced in India since Independence. After the 73rd and 74th CAA, the emphasis has been placed on district planning which in turn has given scope to do Block or Taluka planning so as to achieve inclusive development. Not many village level officials know about the process of block level plan making except in some states. The students are required to prepare a detailed Block or Taluka Plan for a selected block(s) in a district and come out with a detailed analysis, proposals for development and written report.

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THIRD SEMESTER

RP.C.3.1 : Environment and Development

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Environment and Development

Environment and Development interface: Resource Use, exploitation and conservation: Land, water, air and green spaces including forest cover. Impact of various human activities on environment including recreation, tourism, urban waste, and impact on environment.

Module 2: Emerging Concepts

Emerging Concepts: smart growth, clustered cities, ecological foot prints, green development, sustainable cities and inclusive cities for sustainable livelihood; Environment and poverty links; Environment and Economy interaction: Kuznet curve, Green GDP, Carbon Trading, carbon sequencing, environmental accounting, and Green Budgeting.

Module 3: Environmental Risks and Impact and Role of Institutions in Environment Management

Environmental Risks in rural and urban areas, health and environmental links, sustainable growth, carrying capacity, optimum city, Environmental Impact Assessment: project specific, universal; Acts and Regulations; Role of various levels of governments in environmental management; NGOs and other agencies in environmental management; Case studies from developing and developed countries. Political commitment and environmental policy; Local Agenda 21, MDGs, environmental standards.

Module 4: Disaster Preparedness, Prevention and Mitigation

Concepts, processes and perceptions of Disasters – natural and manmade – causes and consequences. Disaster and natural environment: flooding and drainage, landslides, soil erosion, earth quakes, tremor, tsunami, cloud bursts, etc. Damage to people and property due to disaster; Case studies from across the world; Disaster Recovery. Disaster Mitigation Planning and resource management: Disaster preparedness, prevention, displacement and development. Government structure and disaster mitigation, disaster mitigation measures at individual, group and community level. Human response to disaster – short term and long term effects. Integrating disaster mitigation in spatial planning process: micro zoning, building bye-laws, norms and standards, density variations, provisions of infrastructure for disaster mitigation. Disaster insurance at various levels: village, district, and town / city level; Community awareness and participation at various levels; Role of NGOs / CBOs and communities in disaster education. Relevance of disaster management with relevant to development and environment; Use of technology and media for spreading disaster awareness.

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RP.C.3.2 : PROJECT PLANNING

Lecture Hours Per Week	(L) 2+(T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: **Introduction to Project Planning and Policy Parameters**

Introduction to Project, nature of planning projects – Project Life Cycle: Identification, issues involved in identification including source of projects, Formulation: links between projects and local, district, state and national level planning including sectoral policies; pre-feasibility studies; feasibility studies; Concept of Appraisal: Definition, need and aspects; Appraisal Methods: UNIDO, Little-Mirrlees, ZOPP, GOPP, etc.; Finance, cost recovery, standards, operational maintenance, institutional arrangement, design viability, density and cost, public participation, etc., and how these affect a project. Planning projects: Scale, cost, space and time variations; Demand Analysis and forecasting; market analysis; with and without project scenario analysis.

Module 2: Technical, Financial and Economic Appraisal

Magnitude of the project, processes, materials, equipment, reliability of the system to be used, suitability of the plan, layout and design, location of the project, necessary infrastructure, factors of production, methods of implementation, procurement, phasing and implementation schedule; Project profitability at market price; techniques of financial appraisal (methods not based on time value of money and use of time value of money in appraisal); financial effects on the intended beneficiaries, financial risk and sensitivity to price changes, adequacy, autonomy and financial standards and overall financial viability of project through Internal Rate of Return (IRR) and sensitivity analysis; Efficiency pricing: a) Market distortions- shadow pricing: labor, foreign exchange, land and capital; b) Income distribution effect; c) consumption, savings and investment adjustments, d)adjustments for poverty, e)adjustment for merit and demerit goods; calculation of Economic Rate of Return (ERR)

Module 3: **Risk and Uncertainty**

Types of Risk: Systematic and unsystematic, integrating risks in project NPV criterion. Methods: Conservative estimates, project classification, shorter pay back period, certainty equivalent approach, Risk adjusted return, Capital Asset Pricing Model (CAPM), Monte Carlo Simulation, Decision Tree Analysis, Cost and Time over runs in project.

Module 4: Social, Commercial, Environmental and Institutional Appraisal and Evaluation

Socio-cultural context of a project, five entry points to social analysis of a project and how to do that, Use of social assessment methods: PRA, SARAR, etc, Social-Cost-Benefit Analysis and Returns (SRR); Country Specific and Project Specific Procurement: compulsory contract tendering, e- tendering and transparency; Marketing of the project Output; Resource Pricing: Methods of identifying environmental costs and benefits of a project- travel cost, replacement cost, bequest pricing, hedonic pricing, contingent valuation, land values, preventive / mitigation expenses, benefit transfers, productivity changes. Preparation of EIA/EIS in terms of costs and benefits; Institutional Commitment towards a project, Capacity Enhancement Need Assessment (CENA); Five aspects of institutional appraisal: prior experience in the sector, interface between participating institutions, power, responsibility and cost and benefit sharing, institutional covenants, and relevant regional, state and local level actors / agents in a project. Policy level issues: National, Sectoral, State, and local: Fiscal, legal and other policies that affect the projects; Technology usage in a project and its impact; Monitoring a project: Techniques and software's for project monitoring; Evaluation: Types of evaluation and its effectiveness. Problem Solving: Cost effective, cost-benefit analysis, discounted cash-flow techniques, calculation of IRR and ERR.

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RP.C.3.3 : INSTITUTIONAL ANALYSIS AND GOVERNANCE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Institutions in Planning

Type of institutions, their role and relevance (legal, political, social, cultural and economic institutions), formal and informal institutions and spaces – their interface, conflicts, reach, and their effectiveness in planning: Analyzing the institutions: Methods, process and evaluation. Role of the State in Planning: Market facilitative, regulatory and monopoly power.

Module 2: Institutions and Organizations

Formal and informal institutions such as constitutions, electoral rules, property rights, and civil rights. How and why people in different groups, countries, and cultural context of institutions to facilitate collective action. Whether different groups construct distinctly different institutions to deal with similar problems and why similar institutions seem to work differently in differently in distinct societies; Different between organizations and institutions, government and governance; Organizations: types, concepts, theories, structure and functions: approaches to understanding organizations. Institutional building: factors and processes, institution Process and networks – how the network operates; Present organizations dealing with urban and regional planning. Post 73rd and 74th Constitution Amendment Act environment and the modified role and functions of local bodies, local authorities, district authorities and state level agencies; Case studies.

Module 3: Decentralization of Powers

Development Planning and Indian state-centralization, powerlessness, decentralization; the institutional frame and mechanism for urban governance as envisaged in 73rd and 74th Constitution Amendment Act. Transfer of Power from Centre to State and State to Local government, role of the existing planning and development agencies in various states in the light of Constitution Amendment Act; role of various institutions in the governance process and access to government by various stakeholders.

Module 4: Network Governance

Role of the state in relation to other Stakeholders (NGOs, Private Sector, Scientific Network and international institutions), New State Spaces: Invited and contested spaces: changing role of the state- emergence of middle class and its socio-political space, collective bargaining and collective action; role of donor agencies; Advanced Locality Management, Resident Welfare Associations and other agencies in the governance system. Role of People's participation in planning process: Process of inclusion and exclusion in governance. E- Governance and Grievances Redresses system.

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RP.C.3.4 : POLITICS AND PUBLIC POLICY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: State as a manager of resources and Politics of Provision

Political culture of Indian State: Center, State and Local political economy, emergence of state in the federal set up; politics of the state and bureaucracy; politics and emergence of civil society; regeneration and redevelopment politics; Property rights, norms and standards, government market and market by government; regulatory state, reforming state, rent-seeking state and their spatial implications; Land use Politics, politics of provision of housing in urban and rural areas, infrastructure; Decision Making, Decision-Taking process. Financing and Pricing; Case studies from India and abroad on planning and political decisions in their impact on rural and urban development. Examples from: South Korea: conversion of rural land to urban land, FSI changes and resultant changes in land use and form: China, USA and other countries.

Module 2: Nature and Making of Public Policy

The Nature of public problems, planning as a public issue – policy analysis and process: Six Steps in Policy Analysis: how are policies made, who influences the policy agenda and what issues affect policy's 'success' and 'failure'?, what can we learn from how different countries approach similar policy problems? Theoretical frameworks, the role of institutions in the policy process, and the motivation of policy actors. Classical Rational Problem Solving Model. Limitations in Public Sector and the Private Sector, Establishing Analysis.

Module 3: Public Policy Analysis and Strategic Policy Planning

Overview of Policy Process Models, Policy Initiation: Multi-Stream Approaches, policy implementation analysis, life-course approach to policy analysis, Case studies in Policy Process Analysis, Policy Integration: possible areas of integration in Planning; Differences between strategic planning and management in the public and private sectors, Mission statements and goal-setting techniques. Strategic decisions and evaluation, strategic leadership. Co-ordination and networks. Crisis Management. Transformational strategic Management.

Module 4: Public Policy Management and Delivery

How are new information and communication technologies shaping public service delivery?: E-Governance, E-Panchayats, E-Market, etc. Transparency, Accountability, Accessibility, and participatory mechanisms; Trends and Pressures that affect public service organizations, Market based arrangements, Multi-service provider arrangements in public sector setting, and benchmarks in policy management; Land, Environment, Health, Water and other policies – Integration and disintegration of policies – Frequency and commitments to change; Global Commitments: MDG, Environment, etc, and its commitment at the National, State and Local Level. Land Policy: Interest Groups, Acts / agents and policy making process.

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RP.C.3.5 : RESETTLEMENT AND REHABILITATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Land Development and Resultant Resettlement

Land Acquisition Models and Practices in India and elsewhere for projects. Compulsory Acquisition, land sharing and adjustment models, land pooling, negotiated land acquisition. Development induced relocation – voluntary and involuntary resettlement; Resettlement and Rehabilitation Policies. Policies of multi-lateral / bilateral funding institutions: World Bank, Asian Development Bank Policies, National Policy on Resettlement and Rehabilitation and State Policies on R and R and Sector Specific Policies in large projects such as Multi-Purpose Dam Projects, Mining projects, Highway projects, SEZ, etc.

Module 2: Impact of Resettlement and Rehabilitation (R and R) Plan

Poverty and Social Impact Assessment for Development projects: Linear Projects (Roads, railways, etc), vis-à-vis non-linear projects (Township / industrial area development, dams, forests). Impact on vulnerable and indigenous groups: Project Affected People and Project Affected Assets, Impact on Women and Children, Gender Action Plans. Resettlement Plan: Context, content, structure, principles and practices: Economic, social and physical implications of resettlement and rehabilitation. Resettlement options and strategies, Self-relocation and project facilitated relocation; Case studies in Resettlement and Rehabilitation in Development Sectors: Mining, Highways, Power, industrial and township development. Flood affected areas and other infrastructure projects such as Mumbai Transport Project.

Module 3: Rehabilitation

Rehabilitation: Policies, Assessing the livelihood looses, livelihood impact assessment and skill mapping surveys, income restoration strategies, training strategy for skill upgradation and meeting demands for shifting economic profiles in the development area.

Module 4: Participation as an Important Tool for Resettlement and Rehabilitation

Use of Participatory tools for Resettlement Planning. Institutional arrangements for R and R – Role of NGOs / CBOs and other local, state, national and international organizations in resettlement and rehabilitation, Monitoring and Evaluation of R and R interventions.

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RP.C.3.6 : STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) SPATIAL DATA INFRASTRUCTURE

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concepts and Hierarchy

Spatial Data Infrastructure: Concepts, Contents, Nature and SDI hierarchy; Global, National, Regional and Local SDI initiatives. Building a SDI and using it in planning and decision making process. Open Geospatial Consortium – ISO standards (TC211). Data streaming and mining in spatial data infrastructure.

Module 2: From Global to Local SDI applications

National SDI Initiatives: NRDMS: Multi-level spatial data infrastructure, NSDI: Assimilation and Dissemination and Data warehouse; State SDI: NCT Delhi SDI, Karnataka and Kerala Portals; Case studies from various levels. Karnataka's Land Management Programme: Bhoomi, geo portal assisting local to state level planning process; Gujarat's Tax programme, etc.; Application to coastal area planning – Tamil Nadu coast.

Module 3: SDI application in Planning and Decision Support

SDI – Location based technology development, Interoperability arrangement for geospatial data and ontology mapping; Application in Population Data Sets, Natural Resource Repository, Integrated Water Resource Management, mKrishi – application in agriculture and rural development, geospatial application in transportation, disaster management and conservation. Spatio-temporal data modeling and analysis; 3 - D mapping of land and its use in city and regional planning; Geo visualization of landscapes: rural and urban.

Module 4: Technology in SDI and decision support system

Real time technologies and their application: landslides monitoring in Himalayan region, web based spatio-temporal prediction of landslides, decentralization planning in Uttarakhand- web based model. Satellite based and other real time technologies and their use in identifying physical transformation. Its application in urban and rural areas: slum formation, illegal colonies, flash flood warning system in river and coastal belt, etc.

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(b) DISTRICT PLANNING/REGIONAL PLANNING

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The objective of this studio is to expose the students in the practical ways of planning for a region (district / mega / metro Region). The students will be given a live case study to understand the complexities of planning the region, inter-sector, scalar interface, integration, etc. The focus will be to understand the scale of the problem and how to tackle them. It is expected that the approach will be mostly in terms of governance, which the students have acquired through theory subjects in second semester. It is also expected that the students after preparing the plan will present it to the stakeholders to get their viewpoint.

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FOURTH SEMESTER

RP.C.4.1 : FINANCING DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Financing: Introduction

Methods of Financing: Fiscal Transfers under Constitution, 73rd and 74th Constitution Amendment Act and funding, Central and State Finance Commissions. Own Source funding, Equities, debt financing, sell out, refinancing, co-financing, and venture capital issues in Project financing.

Module 2: Role of Finance Commissions

Distribution of revenues between union and state: Finance Commissions- Historical perspective, role of CFCs (First to 13th CFC). Deviations in sharing formula by 13th CFC and its impact on urban and rural infrastructure provision. Service level Bench marks in infrastructure and related funds transfer. State Finance Commissions and fund transfers to local bodies: Issues and recommendations.

Module 3: Reforms at Local Level

Property Tax Reforms, Accounting Reforms and Accounting Standards, Own Source Financing. Credit Rating of Bonds, Pooled Financing of projects: Standards and regulations.

Module 4: PPP as a Funding Option and PPP Management

Conditionality for PPP, Contract Architecture, PPP Design and execution, Responsibility, cost and benefit sharing, types of PPP. PPP Case studies from various sectors: Best and worst practices. Legal issues in PPP. PPP and inclusive development.

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RP.C.4.2 : LEGAL ISSUES IN PLANNING

Lecture Hours Per Week	(L) 2+ (T)1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Law, Indian Constitution Evolution of Planning Legislation

Sources of law: custom, legislation and precedent; Meaning and terms of law: legislation, ordinance, bill, act, regulation, and bye-laws; Significance of law and its relationship to urban and regional planning, benefit of statutory backing, eminent domain powers and police powers; Concepts and contents related to planning, provision regarding property rights, legislative competence of Local, State and Central government to deal with various matters concerning Town and Country Planning; An over view of legal tools connected with urban and regional planning and development. Town and Country Planning Act, Improvement Trust Act, Development Authorities Act: objectives, content, procedures for provision an implementation of regional plans, master plans and town planning schemes; Concept of Arbitration, betterment levy development charges and public participation in statutory planning process, concept of structure plan, local plan and action plan under the Law.

Module 2: Policy and Acts

National Environmental Policy Act; Environmental Protection Act; Land Acquisition Act: Concepts, procedure for compulsory acquisition of property and determination of compensation.

Acts pertaining to SEZ; disaster management, and legal aspects of innovative techniques such as Transfer of Development Rights, Accommodation Reservation (AR), Air Rights, etc.

Module 3: Habitat Laws and Significance of Land Development Control

Laws relating to Slum Clearance, environment, housing, landscape and traffic, Laws relating to conservation and restoration, historical monuments, archaeological sites and remnants of national importance; contract management and execution of projects; Objectives of legal tools, critical evaluation of zoning, sub-division regulations, building regulations and bye-laws, development code zoning, periphery control, land conversion in the peri-urban areas.

Module 4: Professional Practice

Aims and objectives of professional institute, sister bodies, professional role and responsibility of planning consultants, professional ethics and code of conduct and scale of professional charges. International Agreements (GATT and WTO) and its impact in India. Formulation of Consultancy project proposal and outlines (EOI, RFP, etc); Formulation of Consultancy Contract Agreement and Contract Management Scale of Professional Charges, and Collaborative projects; Role of Inter-Disciplinary groups; appreciation of decision making process and the process in relation to varied consultancy assignments in planning. Management of office and personnel.

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RP.C.4.3 : THESIS

Lecture Hours Per Week	(L) 0+ (T) 24*
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

Students are expected to write a thesis on the topic selected by them with the constant guidance from faculty members. Students are expected to have obtained the skills in understanding the various aspects of regional planning and apply them in their thesis work.

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M. PLAN / M. TECH. (PLANNING) – SPECIALIZATION IN ENVIRONMENTAL PLANNING

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Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
EP.C.2.1	Theory of Environmental Planning	2 + 1	2	50	50	100
EP.C.2.2	Environmental Design	2 + 1	2	50	50	100
EP.C.2.3	Environmental Monitoring and Assessment	2 + 1	2	50	50	100
EP.C.2.4	Environmental Impact Assessment	2 + 1	2	50	50	100
EP.C.2.5	Environmental Monitoring and Assessment (Laboratory)	0 + 3	2	50	50	100
Sub-Total		**4 + 7**	**10**	**250**	**250**	**500**
EP.C.2.6	**Planning and Design Studio**					
	Module I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Module II: Environmental Planning and Assessment	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**11 + 19**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
EP.C.3.1	Environmental Economics and Auditing	2 + 1	2	50	50	100
EP.C.3.2	Environmental Protection and Management	2 + 1	2	50	50	100
EP.C.3.3	Environmental Legislation, Evaluation and Practices	2 + 1	2	50	50	100
EP.C.3.4	Advanced EIA Techniques	2 + 1	2	50	50	100
EP.C.3.5	Planning Legislation	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

EP.C.3.6	**Planning and Design Studio**					
	Module I: Geo-Informatics Laboratory Training	3 + 0	2	50	50	100
	Module II: Management and Conservation Plan	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
EP.C.4.1	Formulation, Financing and Management of Developed Projects	2 + 1	2	50	50	100
EP.C.4.2	Seminar on Emerging Environmental Concepts	2 + 1	2	50	50	100
EP.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**38 + 82**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

* L stands for Lectures and T stands for Tutorials or Studio.

** All students are required to undertake internship after second semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate satisfactory performance.

M. Plan / M. Tech. (Planning) – Specialization in Environmental Planning

SECOND SEMESTER

EP.C.2.1 : THEORY OF ENVIRONMENTAL PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concepts of Ecology, Ecosystem and Environmental Planning

History of Environmental Planning, Development of habitat patterns, settlement structure and form in response to environmental challenges; Concepts of Ecology and Ecosystem, Urban Ecosystem.

Module 2: Resource Analysis and Conservation

Resource analysis for various ecosystems and development imperatives (land, geology, soil, climate, water, vegetation) characteristics, exploitation, causative factors for degradation, analytical techniques.

Module 3: Environmental Zones

Environmental Zones (Hill, coastal, arid, characteristics, resources, settlements pattern, problems and potentials, regulating mechanisms for development.

Module 4: Environmental Policies, Significant Conventions, Conferences

Environmental Policies and initiatives including policies, strategies, protocols, treaties and agreements.

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EP.C.2.2 : ENVIRONMENTAL DESIGN

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Evolution of Environmental Design, Theory and Practice

Design as a determinant of Environmental quality; evolution of Environmental design, theories and practice of design.

Module 2: Approach of Environmental Design as Applicable to Built Environment

Criteria of Urban Environmental design issues-pedestrian-vehicular conflict, City Centre Environment, Housing areas, dereliction, environmental upgradation programmes; built environment aesthetics of ensemble of buildings, techniques of study of building condition, conservation aspects of built-up areas. Environmental approaches to design and planning of rural settlements, use of alternate technology in design of human settlements.

Module 3: Approach of Environmental Design as Applicable to Landscape Development

Landscape as an environmental asset, techniques of landscape assessment at different levels, use of landscape design for environmental improvement.

Module 4: Urban Climatology, Acoustics and Climate Change

Urban climatology, effects of thermal pollution, factors causing heat sink effects, direct radiation, climatic effects on Urban areas, control techniques Urban acoustics:- source of noise, methods of control, design techniques. Climate Change and City Planning, application of Energy code, Clean Development Mechanism.

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EP.C.2.3 : ENVIRONMENTAL MONITORING AND ASSESSMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module1: Air Pollution

Air Pollution-sources, causes/pollutants and their effects, emission sources, vehicular emissions, techniques of monitoring of emissions, emission standards, and ambient air quality. Concepts of relevant meteorological parameters, and interpolation of data, wind system measurement, turbulence; mixing height, plume use, dispersion and dispersion models.

Module 2: Water Pollution

Water Pollution – sources, water quality tests, minimum standards of disposal (for different uses), performance criteria.

Module 3: Noise Pollution

Noise Pollution- sources, techniques of measurement, noise level standards, noise levels.

Module 4: Land Pollution

Land Pollution -sources, soil erodibility tests, minimum standards of disposal (minimum standards for different uses), performance criteria; interpretation of analytical trends of various parameters of quality of environment as above.

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EP.C.2.4 : ENVIRONMENTAL IMPACT ASSESSMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Role, Definition and Scope of EIA

Role of EIA in the Planning and decision making process. Definition and need, evolution and objectives, tasks and scope.

Module 2: Methods of EIA

Methods of EIA; advantages and limitations.

Module 3: Assessment of Impacts

Assessment of impacts on resources (Including air, water, flora and fauna); assessment of impacts on Land use. Assessment of social and health impacts.

Module 4: Role of Public Participation in EIA

Public Participation in EIA; definition and concepts, objectives, techniques, advantages and limitation, PRA techniques.

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EP.C.2.5 : ENVIRONMENTAL MONITORING AND ASSESSMENT (Laboratory)

Lecture Hours Per Week	(L) 0+ (T) 3*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Air Quality Parameters

Familiarization with relevant instruments/equipments and procedures (High Volume Sampler, Handy Sampler, Noise Meter, Spectrophotometer etc); TSPM, RSPM, SO_2, NO_X, Stack Monitoring, Noise Level Measurements etc.

Module 2: Water Quality Parameters

Familiarization with relevant instruments/equipments and procedures (Flame Photometer, Water Testing Kit, Digital pH meter, BOD Incubator, Dissolved Oxygen Meter) Alkalinity, Amonical Nitrogen, BOD, COD, DO, Coliform, Fluoride, Nitrate-Nitrogen, pH, SAR, etc.

Module 3: Soil Quality Parameters

Familiarization with relevant instruments/equipments and procedures (Soil Testing Kit)
pH, EC, Soil Moisture, Phosphate, Potassium, Sodium, etc.

Module 4: Weather Parameters

Familiarization with relevant instruments/equipments and procedures (Electronic Weather Station). Temperature, Relative Humidity, Rainfall, Wind Direction and Speed, etc.

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EP.C.2.6: PLANNING AND DESIGN STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Geo-Informatics Laboratory Training

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Introduction to Geo-informatics, introduction to Remote Sensing – Aerial and Satellite; introduction to GIS, Spatial data and Attribute data; Satellite images as input to GIS; Collection and presentation of baseline information.

(b) Environmental Plan and Assessment

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

Planning and Design Studio exercises pertaining to

- Environmental Status
- Environmental Impact Assessment
- Environmental Improvement/ Conservation /Safe and Healthy City

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THIRD SEMESTER

EP.C.3.1 : ENVIRONMENTAL ECONOMICS AND AUDITING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Monitory Evaluation Methodologies

Uses of monetary valuation – Cost Benefit Analysis, National Resource Accounting, Pricing, Non-use Value, Techniques of monetary evaluation / valuation methodologies.

Module 2: Economic Measures of Sustainable Development

Economic approaches of measuring sustainable development; measuring wealth, modifying GNP, savings, technological Change, Social Capital, Property right, creating global markets.

Module 3: Environmental Performance Evaluation

Environmental Certification, Performance evaluation, Environmental Auditing, Eco-labeling, ISO.

Module 4: Case Studies

National and International projects relating to environmental economics.

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EP.C.3.2 : ENVIRONMENTAL PROTECTION AND MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1 : Environnemental Protection Techniques

Air pollution mitigation and abatement; water pollution mitigation and abatement Noise attenuation; EPA Guidelines; role of Government and Non-Government Organizations in Environmental Protection; best practices in Environmental Protection and Conservation; International Co-operation for Environmental Protection.

Module 2: Environmental Management

Resource Management: Including management of land, water bodies and water channels, forests and wildlife, minerals. Management of Urban Areas; Management of sensitive areas – hills, coasts, arid, wetlands etc. (including participatory approaches); management of Watersheds.

Module 3: Appropriate Technologies and Applications

Techniques and case studies related to water harvesting, water treatment, recycling, waste disposal, waste minimization, and their implications. Low cost and cleaner technologies. Models of Collaboration Environmental Planning.

Module 4: Alternate Energy Technologies

Technologies related to alternate energy- Solar, biomass, biogas, hydro, wind and their usefulness in settlements.

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EP.C.3.3 : ENVIRONMENTAL LEGISLATION, EVOLUTION AND PRACTICES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

- EP Act 1986
- Air (Prevention and Control of pollution) Act
- Water (Prevention and Control of pollution) Act
- Mines and Mineral Act
- Factories Act
- Pesticides Act
- Indian Forest Act
- Wildlife Act
- Ancient Monuments and Archaeological Sites and Remains Act
- Hazardous Waste Management and Handling Rules / Biomedical Rules / Solid Waste Management Rules
- Environment Tribunal Act
- Climate change Protocols and Conventions
- MOEF Guidelines and Notifications
- Appellate Authority Act
- Other related Notifications

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EP.C.3.4 : ADVANCED EIA TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module1: Assessment of Development Projects

Highways, industries, construction and new townships.

Module 2: Risk Assessment / Vulnerability Assessment

International and national methodologies; Case studies.

Module 3: Strategic EA / Sustainability Appraisal

International and national methodologies; Case studies.

Module 4: Carrying Capacity / Environmental Thresholds / Ecological Footprint

International and national methodologies; Case studies.

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EP.C.3.5 : PLANNING LEGISLATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Planning Legislation –General

Concept of Law: Source of law (i.e. custom. legislation and precedent), meaning of terms of law, legislation, ordinance, Bill, Act, Regulations and Bye-laws. Significance of law and its relationship to urban planning benefit of statutory provisions-eminent domain and police powers.

Module 2: Indian Constitution and Planning Legislation

Indian Constitution: Concept and contents, provisions, regarding property rights, Legislative competence of staff and central Government to enact town planning legislation. Evolution of Planning legislation. An over view of legal tools connected with Urban Planning and Development, Town and Country Planning Act, Improvement Trusts Act, Urban Planning and Development Authorities Act -objectives, content, procedures for preparation and implementation of regional plans, Master Plans and Town Planning schemes.

Module 3: Planning Legislation –Acts and Amendments

Concept of Arbitration; Betterment levy; development charges and public participation in Statutory planning process; Concepts of Structure Plan; local plan/and action plan under the English law. Land Acquisition Act 1884 - Basic concept, procedure for compulsory acquisition of property and determination of compensation.

Module 4: Land and Other Legislation

Urban land (Ceiling and Regulation) ACL 1976 – objectives, contents and planning implications. Significance of Land Development Control – objectives, contents and legal tools, critical evolution of zoning, sub-division regulations, building regulations and bye-laws, Development Code, Zoning law and law relating to periphery control. 73rd and 74th Constitutional Amendment Act, 1992.

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EP.C.3.6 : PLANNING AND DESIGN STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Geo-Informatics Laboratory Training

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The laboratory training will be conducted in accordance with the studio exercise. Spatial data structures, vector and raster; spatial analysis and decision making using GIS; Environmental data sources; Exposure to Environmental Information System (ENVIS).

(b) Management and Conservation Plan

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

Planning and Design Studio - Exercises pertaining to: A Settlements / Region

- Management Plan
- Conservation Plan

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FOURTH SEMESTER

EP.C.4.1 : FORMULATION, FINANCING AND MANAGEMENT OF DEVELOPMENT PROJECTS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Role and Methodology of Project Identification and Formulation

The role of project formulation and appraisal in the Planning process; Methodology for project identification and formulation: Preparation of Preliminary studies, Feasibility Reports and Detailed Project Reports. Appraisal of Project, Monitoring of Projects; Reports: Review of project appraisal techniques adopted by financing agencies.

Module 2: Cost Benefit Analysis

Financial cost-benefit analysis: cash flow techniques, Net present value, internal rate of return. Benefit-cost ratio, etc., Exercises and case studies; Social cost-benefit analysis: Tradeoff between efficiency and equity goals in project appraisal, measurement of direct and indirect costs and benefits in different sectors of urban and rural development, Case studies.

Module 3: Risk and Trend Analysis

Risk and uncertainty in the project environment; sensitivity and profitability analysis in the Indian context; Emerging trends in the decision making process with respect to project appraisal and resource allocation at various levels of government.

Module 4: Logical Framework Analysis

Methodology and case studies.

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EP.C.4.2 : SEMINAR ON EMERGING ENVIRONMENTAL CONCEPTS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

- Environmental Information Systems and Models
- Sustainable Settlements
- Ecological Footprints
- Environmental Security
- Environmental Disaster
- Ecotourism
- Urban Ecology
- Energy Planning in Urban Settlements.
- Any others

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EP.C.4.3 : THESIS

Lecture Hours Per Week	(L) 0+ (T) 24*
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

Thesis incorporating aspects of environmental analysis and spatial climate will be prepared. The students are required to carry out independent research and prepare a thesis on a topic on urban planning selected by them and approved the faculty under the supervision of a research guide allocated by the department.

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M. PLAN / M. TECH. (PLANNING) - SPECIALIZATION IN HOUSING

7

Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3 + 0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
H.C.2.1	Urban and Rural Housing Policies and Programmes	2 + 1	2	50	50	100
H.C.2.2	Housing Standards, Design and Projects	2 + 1	2	50	50	100
H.C.2.3	Materials, Technology and Infrastructure	2 + 1	2	50	50	100
H.C.2.4	Urbanization and Land Management	2 + 1	2	50	50	100
H.C.2.5	Housing Finance and Project Formulation	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
H.C.2.6	**Housing Studio**					
	Module I: Survey Techniques, RS and GIS	3 + 0	2	50	50	100
	Module II: Housing Options and Strategy	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
H.C.3.1	Real Estate and Housing Markets	2 + 1	2	50	50	100
H.C.3.2	Informal Housing, Slums and Poverty	2 + 1	2	50	50	100
H.C.3.3	Disasters and Settlements	2 + 1	2	50	50	100
H.C.3.4	Legislation and Professional Practice	2 + 1	2	50	50	100
H.C.3.5	Inclusion, Participation and Communication	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

H.C.3.6	**Housing Studio**					
	Module I: GIS Applications in Housing	3 + 0	2	50	50	100
	Module II: Project Formulation and Design	0 + 12	8	250	150	400
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
H.C.4.1	Governance and Management for Housing	2 + 1	2	50	50	100
H.C.4.2	Housing for Special Area	2 + 1	2	50	50	100
H.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**40 + 80**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

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M. Plan / M. Tech. (Planning) - Specialization in Housing

SECOND SEMESTER

H.C.2.1 : URBAN AND RURAL HOUSING POLICIES AND PROGRAMMES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Urban and Rural Housing Policies and its role in national development, objectives of policy in relation to settlement planning, basic components of housing policy and programmes formulation in urban and rural areas, housing policies in India and abroad, its impact and consequences on housing development, housing policy and their focus in different developing and developed countries, their significance in provision of housing programmes for low-income groups, their formulation implementation and evaluation role of international and national funding agencies in housing programmes special housing programmes in different countries.

Module 2: Housing in Rural India

Socio-economic profile of rural India and rural housing conditions-types of traditional building materials and construction methods, house types, rural housing norms, standards and design, access to infrastructure, improvement in quality of life in rural areas, rural health and sanitation, environmental improvement in villages, concept of integrated rural housing development, rural housing schemes, impact of large development projects and community development in rural areas, special needs for housing for tribal.

Module 3: Global Overview

Review of urban and rural housing policies in various countries with particular focus on South East Asian countries

Module 4: Case Studies of Policies and Programmes

Various urban and rural housing programmes including the current JNNURM, RAY, Bharat Nirman, PURA, etc.

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H.C.2.2 : HOUSING STANDARDS, DESIGN AND PROJECTS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Neighborhood planning, design standards and their significance in housing process, socio-economic and aesthetic, environmental factors affecting layouts, various concepts of layout planning, row and multi storied housing, layout optimization techniques, appropriate DU design.

Module 2: Site Planning

Site analysis, visual design factors, consideration for infrastructure, organization of space, criteria for location of blocks and landscape elements, energy efficient design, methodology for formulation of housing projects, design considerations in housing projects.

Module 3: Infrastructure Design

Detailed analysis on water supply, sewerage, drainage solid waste disposal, electricity, roads and transportation and all community facilities, standards for physical and social infrastructure layouts, development controls and phasing, specific consideration, for plotted development and group housing site and services project.

Module 4: Case Studies

Case studies of housing projects.

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H.C.2.3 : MATERIALS, TECHNOLOGY AND INFRASTRUCTURE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Materials and Technology

Building materials traditional and conventional, low cost materials, significance of technology for housing development, conventional technologies and modern technologies, appropriate technology, technology for housing in the context of housing development in India and the third world.

Module 2: Prefabrication and Industrialization and Construction Industry

Concept of prefabrication, industrialization and system building, various open and closed systems, choice of various systems of building, concept of intelligent building; Organization of the construction industry in India-Significance of Housing construction industry, its characteristics and role of various factors involved; Small scale enterprises in the housing construction industry-building material manufacturers, sellers and small contractors. Significance of resources and manpower in housing construction, need for imparting in housing building, concept of *Nrimithi Kendras*.

Module 3: Cost Optimization

Cost reducing techniques, environmental friendly technologies, role of technology in housing projects formulation-cost time and other implications, Emerging technological perspectives for house construction, infrastructure and housing area planning.

Module 4: Alternative Technologies

Role and significance of Physical infrastructure in housing development, characteristics of various components of physical planning and design of infrastructure, appropriate technology for infrastructure development, rain-water harvesting, use of solar energy, wind energy and other appropriate technologies; Role of BMTPC and other organizations in promotion of new and alternative technologies.

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H.C.2.4 : URBANIZATION AND LAND MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Urbanization

Global population change and urbanization, Regional perspectives on population and urbanization with special reference to Asia and Pacific; Emergence of large cities; Impact of urbanization, globalization and economic policies.

Module 2: Peculiarities of Land in India

The status of land in the Constitution of India, peculiar nature of land markets; Factors affecting supply and demand of land for housing; Role of Fiscal policies and development regulations of land market.

Module 3: Land Policies

Land policy objectives and policy options for public intervention; Techniques of land assembly and expropriation, development components and financing land development; Institutional and political concerns in land management.

Module 4: Types of Land Management

Various approaches viz. land pooling/land readjustment, TP Schemes, Public Private Partnerships for land assembly, role of the private sector in land assembly, land management thru' Township Policies of various state governments, international and domestic case studies.

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H.C.2.5 : HOUSING FINANCE AND PROJECT FORMULATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Financial Environment

Financial environment at the national level, financial system and regulation, Characteristics of housing finance, policy for housing finance in national plans,

Module 2: Sources and Methods of Financing

Sources of finance, public – private sector investment in housing, finance in urban and rural sector implications of long-term and short term financing, fiscal aspects of subsidizing public and private housing, housing finance requirements of economically weaker sections; Methods of financing, specialized finance institutions, mortgage financing systems, non-institutional financing, present trend in housing finance in India and in other countries, fiscal incentives in annual budgets, direct and indirect tax proposals.

Module 3: Roles of Organizations

Role of HUDCO, NHB, HFIs, various international donor/financing agencies, micro finance institutions, rural housing finance.

Module 4: Projects and Financial Feasibility

Financial feasibility of projects, various financial instruments, concepts of IRR and NPV, basics of cash flow analysis, financial structuring of projects, preparation of DPR.

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H.C.2.6 : HOUSING STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Survey Techniques, Remote Sensing and GIS

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Introduction to aerial photography, remote sensing, images geometry, image quality etc. date acquisition aerial, false color and thermal photography and other remote sensing applications; Applications in regional planning morphology, contour building, geological formation, social classifications, settlement patterns, regional landscape features, water bodies, forest reserves, deforested areas, transport network-road, water irrigation systems, plantation areas, cropping patterns flora and fauna, sanctuary areas etc. interpretations and uses of aerial photography in locational analysis of regional networks, engineering works such as dams and reservoirs, terminal facilities such as airports strategic and military installation, regional potential recreational areas and identification of urban expansion areas. *Conceptual model of spatial and non-spatial information system, digital, editing and structuring of map data, spatial data analysis: raster* and vector based overview of GIS packages global positioning system.

(b) Housing Strategy

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

The objective of this exercise is to evolve comprehensive housing development strategy for the selected city by studying city level and housing subsystem level aspects and estimating housing shortage; projecting housing need and demand and preparing alternative scenario's for housing development. The studies need to be carried out mainly thorough secondary sources. A field visit to any town/city in India has to be made.

*** L stands for Lectures and T stands for Tutorials or Studio.**

THIRD SEMESTER

H.C.3.1 : REAL ESTATE AND HOUSING MARKETS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Introduction to real estate, definition, principles of real estate value concepts, methods of valuation, introduction to real property ownership, leasing property succession, methods of sale/ purchase, title search,

Module 2: Investment and Laws

Real estate investment analysis and portfolio management, foreign direct investment (FDI), role of NRIs and PIOs in the investment market, marketing and brokerage; Introduction to various laws related to real estate.

Module 3: Real Estate Project Formulation

Real estate project formulation, real estate development process, asset management, property insurance, real estate case studies, taxation and fiscal incentives, government policies and industry organization, public-private partnerships and JV'S, rating, risk assessment.

Module 4: Housing Markets

Concepts and definitions, housing market, area, the purpose and nature of housing market studies; factors affecting housing prices, housing market behavior, estimation of housing need, housing demand and identification of housing stress, factors affecting local housing market, housing demand and supply market process, housing search residential mobility and filtering causes and consequences, policy influence on housing market, the formal and informal housing markets and their impact on urban poor, public, Co-operative and private sector housing market, process and supply institutional frame work.

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H.C.3.2 : INFORMAL HOUSING, SLUMS AND POVERTY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Informal Housing

Emergence and growth of Informal Housing in third world cities and formal regulatory framework Diversity of housing needs of urban poor and informal housing options pavement dwelling, squatting, illegal land-subdivision, inner-city organic housing, and urban villages. Causes of growth and perpetuation and impacts of illegality.

Module 2: Informal Economy

Linkages of informal economy-supportive policies of settlement upgrading and options of tenure security. Impacts and obstacles to regularization. Integrated, participatory improvement approaches.

Module 3: Slums and Government Intervention

Process of slum formation, causes and consequences, approaches to tackle the challenge of slums, relocation, rehabilitation, in-situ upgradation, etc.

Module 4: Civil Society and Poverty

Role of NGO's and CBO's in the improvement process; Dimensions of poverty and its manifestation in the housing sector, indicators, programmes specifically targeted towards slums and the urban poor, shelterless population.

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H.C.3.3 : DISASTERS AND SETTLEMENTS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Disasters

Natural and man-made disasters, meaning, factors and significance, causes and effects, global and local disaster profile,

Module 2: Planning for Disaster Prone Areas – I

Typology of disasters in India, human behavior and response, scope and objectives of disaster mitigation / preparedness and response / prerequisites for preparedness planning; action plans and procedures, training issues and models, checklists/disaster response planning, roles and responsibilities of various agencies/emergency operations support and management, community participation, public awareness

Module 3: Planning for Disaster Prone Areas – II

Planning for disaster prone areas, disaster mapping, vulnerability analysis, vulnerability atlas, predictability, forecasting and warning, relief measures, reconstruction and rehabilitation, disaster preparedness plan land use zoning for disaster management, infrastructure management skill assessment.

Module 4: Disaster Resistant Housing

Disaster resistant housing construction practices and codes, engineered and non-engineered structures, preparedness for climate change, role of specialized agencies for disaster management.

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H.C.3.4 : LEGISLATION AND PROFESSIONAL PRACTICE

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Concept of law, legislation, ordinance, bill, Act Regulation and by-laws, provision regarding property rights, legal right, legislative competence of state and central Government to enact town planning legislation, concept of Eminent Domain and Police Powers.

Module 2: Law and Urban Planning

Significance of law and its relationship to urban planning benefits of statutory backing of planning schemes, public participation in statutory planning process, evolution of planning legislation and overview of legal tools connected with urban planning and development.

Module 3: Professional Practice

Aims and objectives of professional institute sister bodies professional role and responsibility of planning consultants, professional ethics code of conduct and scale of professional charges, formulation of project proposal and outlines, consultancy agreements and contracts, role in interdisciplinary groups, role in decision making processes and the process in relation to varied consultancy assignment of planning.

Module 4: Various Acts

Urban planning and development authority act, housing board act. Improvement trust act, Slum clearance act, Apartment act, Rent control act, Municipal act introduction to property law, property tax, assessment, lease, registration, etc., cooperative act.

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H.C.3.5 : INCLUSION, PARTICIPATION AND COMMUNICATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Importance of communication for town planners, role of effective communication in society, understanding concept of inclusion, community based organizations, NGOs, RWAs, SHGs,

Module 2: Processes and Techniques of Communication

Understanding participatory processes, techniques of participation, methods of communication, written, oral and visual communication, objective of communication, developing a communication strategy, writing technical reports,

Module 3: Mandatory Participation

Social audit, community participation law,

Module 4: Communication in Practice and Cases

Preparing maps and other documents, conducting communication with small groups, stakeholders and the masses, organization of consultative meetings, managing community / participatory processes, role of elected representatives in participatory processes, community participation in project formulation; Best practices and case studies.

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H.C.3.6 : HOUSING STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) GIS Applications in Housing

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Network analysis, digital elevation model (DEM) and digital terrain model (DTM) Geospatial analysis, internet GIS, decision support system(DSS), automated mapping and facility management (AM/FM), open GIS overview, customization of geo information; Inputs into and integration with housing project formulation and design studio exercise.

(b) Project Formulation and Design

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

Site selection, site analysis, feasibility studies, to formulate the project and design of selected area, Greenfield or redevelopment, which shall include development options concept for dwellings, plans and layout, costing, pricing, financing, phasing, implementation and management and post occupancy estate management, financial feasibility.

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FOURTH SEMESTER

H.C.4.1 : GOVERNANCE AND MANAGEMENT FOR HOUSING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Principles of good governance, Public governance in India, overview of urban governance structure in India, governance for the housing sector.

Module 2: Organizations

Definition and concepts in organization, factors affecting organizational structure administrative context of housing organization in India, organizational theories and their effectiveness, housing organizations in India at national, state and local level, role of improvement trusts, housing boards, development authorities and slum improvement boards and cooperatives.

Module 3: Partnerships

Role of private sector and NGOs, role of financing agencies and linkages with other agencies, relationship between housing and non housing organizations internal administrative problems of housing agencies public – private partnerships, joint ventures, organizational reforms and privatization, outsourcing and contracts.

Module 4: Management Concepts and Project Management

Need for housing management, basic elements of management, planning, organization, staffing, coordination and monitoring and its relevance of housing sector; Importance of leadership development, communication and motivation; National goals, political system affecting development management; Managing and monitoring housing projects. Participatory management processes and managing joint ventures. Post occupancy management of housing estates.

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H.C.4.2 : HOUSING FOR SPECIAL AREAS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Special Areas

Inner City Housing: Evolution and Historical Background, community, spatial Characteristics, housing transformation of core city, impact of transformation, Problems of inner cities, policies and programmes.

Fringes / Peri-urban / Sub-urban Housing: Rural urban linkages, characteristics of fringe areas, development process, various modes of land Supply in fringe area, case study with special emphasis on housing.

Arid / Coastal / Hilly Region Housing: Settlement and shelter characteristics, Materials and technology, design standards, climatic factors, danger of hazards, Settlement planning, development policies and programmes.

Module 2: Special Groups

Housing for Aged / Physically Challenged: Concept and definition of old age characteristics of aging population, profile and growth of elderly persons, classification of elderly population, problems of elderly planning and design considerations for elderly, case study with special reference to housing.

Module 3: Housing for Women, Children and Refugees

Importance of gender in housing, housing planning and design considerations with women perspective – hierarchy of spaces at macro and micro level, shelter for low income women, design considerations for urban and rural women, housing options for different categories for single women, government schemes, case study with special reference to housing. Concept of refuges, types of refuges, norms for treatment of refugees, refugees law, refugees and housing, problems of refugees, planning considerations for the refugees, case study areas with reference to housing.

Module 4: Shelterless and Tribal Housing

Shelterless in the context of urban poor, psychological and social implications of poverty on homeless, homeless in metropolis, problems of homelessness, various interventions, night shelters, case studies; Socio cultural and economic profile, settlement characteristics, housing typology, housing schemes, polices and programmes, for tribal upliftment, case study area.

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H.C.4.3 : THESIS

Lecture Hours Per Week	(L) 0+ (T) 24*****
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

Every student is required to prepare a thesis on a specific topic approved by the Department as per guidelines issued from time to time.

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M. PLAN / M. TECH. (PLANNING)
SPECIALIZATION IN TRANSPORTATION PLANNING

8

Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
TP.C.2.1	Traffic Engineering	2 + 1	2	50	50	100
TP.C.2.2	Public Transport Planning	2 + 1	2	50	50	100
TP.C.2.3	Urban Transport Planning	2 + 1	2	50	50	100
TP.C.2.4	Highway Planning and Design	2 + 1	2	50	50	100
TP.C.2.5	Transport Economics	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
TP.C.2.6	**Studio**					
	Module I: Traffic Laboratory and Software Applications	3 + 0	2	50	-	50
	Module II: Comprehensive Traffic and Transportation Plan for a City	0 + 12	8	250	200	450
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
TP.C.3.1	Transport Infrastructure Design	2 + 1	2	50	50	100
TP.C.3.2	Analytical Transport Planning	2 + 1	2	50	50	100
TP.C.3.3	Logistics and Freight Distribution	2 + 1	2	50	50	100
TP.C.3.4	Traffic Control System and Road Safety	2 + 1	2	50	50	100
Elective Subjects (Select any one)						
TP.E.3.1	Intelligent Transport System	2 + 1	2	50	50	100
TP.E.3.2	Advanced Transportation Economics					
TP.E.3.3	Financing Transport System					
TP.E.3.4	Regional Transport Planning					
TP.E.3.5	Pavement Materials and Design					
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

TP.C.3.5	**Studio**					
	Module I: Analytical Quantitative Techniques	3 + 0	2	50	-	50
	Module II: Project on Detailed Micro or Project Level Study on Transport Infrastructure Planning, Design and Management for a Case Study of Urban or Inter-Urban or Regional Level	0 + 12	8	250	200	450
Sub-Total		**3 + 12**	**10**	**300**	**200**	**500**
Total		**13 + 17**	**20**	**550**	**450**	**1,000**
FOURTH SEMESTER						
Core Subjects						
TP.C.4.1	Transport Policy, Legislation and Institutional Framework	2 + 1	2	50	50	100
TP.C.4.2	Project Formulation and Appraisal	2 + 1	2	50	50	100
TP.C.4.3	Thesis	0 + 24	16	500	300	800
Total		**4 + 26**	**20**	**600**	**400**	**1,000**
Grand Total		**43 + 77**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

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**All students are required to undertake internship after second semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate of satisfactory performance.

M. Plan / M. Tech. (Planning) -
Specialization in Transportation Planning

SECOND SEMESTER

TP.C.2.1 : TRAFFIC ENGINEERING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Basic Concepts

Definition, concepts, scope and utility of traffic engineering; relationship between the traffic flow variables, fundamental diagrams of traffic flow ; Definition of capacity and level of service, factors affecting capacity and level of service, static and dynamic PCU, Design service volume, capacity norms for urban roads with different widths.

Module 2: Design of Urban Road Infrastructure

Urban Road cross-sectional elements- right of way, carriageway, median, service lane, footpath, curb, camber, side slope, service road etc. for different hierarchy of urban roads; geometry of horizontal curves and vertical curves of urban roads, super elevation, sight distance, access control etc. along urban roads ; Street Lightings types and design ; guard rails; traffic signs and marking; NMT facilities, road landscape design features on urban roads.

Module 3: Design of Intersections

Types of intersections, visibility, Design principles – alignment and vertical profile, visibility, radii of curves, channelization; roundabouts- capacity and design; capacity of signalized intersection; Grade separated intersection design elements- ramp gradient, acceleration and deceleration lanes ,weaving sections, etc..

Module 4: Traffic Management Systems and Safety

Introduction to traffic signals, warrant for signals, phasing and inter green period, saturation flow, optimization of signals, Vehicle actuated signal facilities, co-ordination of traffic signal, area traffic control system; Basic principles of regulation and its enforcement; Traffic management measures, Transport System Management techniques, Road safety- collection and analysis of accident data, accident prevention strategies.

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TP.C.2.2 : PUBLIC TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Public Transport Systems

Urban passenger transport system characteristics, public transport modes, genesis of public transport system, mass transit system, Para transit system, technological features, Demand for public transport, public transport demand and supply indicators, determinants of public transport supply and demand, public transport supply and demand characteristics in cities of various sizes and socio economic setting

Module 2: Public Transport Performance and Economic Aspects

Physical and financial performance indicators for public transport, performance characteristics of various public transport modes including para-transit modes, Public transport fare types and pricing criteria, costs, services; price elasticity of demand; subsidy issues; regulation, privatization impacts and integration issues on public transport performance; public transport financing;

Module 3: Public Transport Network Planning and Scheduling

Public transport based city forms and structure, Transit Oriented Development (TOD); Impact of city density, size, activity concentration on public transport patronage. Form, type and density of bus route network, bus route network planning principles; Types of bus priority measures, merits and limitations, case studies; bus operation design; bus scheduling and time table principles. !

Module 4: Bus Stops, Terminals and Depot Infrastructure

Bus stops – types and characteristics , planning guidelines, pedestrian –public transport interface ; Bus Terminals – types, assessment of facilities and land areas for terminals; interchange- concepts, function and planning guidelines; bus depot -concepts, function, activity and land requirements, planning guidelines

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TP.C.2.3 : URBAN TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Urban Transport Trends and Policies

Urbanization trends, urban transport systems in various cities, impact of urbanization on urban transportation; mobility trends and issues; Urban transport policies and issues related to sustainability; strategies for urban transport improvement; international best practices.

Module 2: Urban Transport and Land Use

Urban forms and structure and its impact on travel pattern, land use -transport cycle, concept of accessibility and its impact on land use, Principles of Land use- transport model

Module 3: Transport Planning Surveys and Studies

Urban transport planning process; study area delineation, zoning; data needs; surveys and studies; analytical outputs and their use.

Module 4: Transport Demand Modeling

Aggregate demand modeling approach- trip generation models, trip distribution models and its calibration, modal split models and its calibration, traffic assignment techniques; calibration and validation checks; alternate scenario development, model testing and evaluation; freight generation models.

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TP.C.2.4 : HIGHWAY PLANNING AND DESIGN

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Highway Planning and Management

Trends in highway planning and road development in country, planning approaches for rural roads, highway administration and finance, Surveys and Investigations, traffic surveys, alignment and route location, drainage studies, soil investigation ; overview of Highway Asset Management

Module 2: Highway Capacity and Design Standards

Highway capacity fundamentals, norms for various types of highways; Cross sectional elements of highways- horizontal and vertical alignment, types of curves and their design – simple, compound , reverse, transition; sight distances along highways, principles of hill road design; intersections designs along highways

Module 3: Pavements and Drainage system

Types of pavement- rigid and flexible pavement, fundamental of pavement design skid resistance, pavement roughness, Highway drainage principles, surface drainage, road side drainage, subsurface Drainage; cross- drainage structure-culverts, causeway and bridges

Module 4: Highway Economics, Management System and Environment

Economics of pavement types, cost of construction and maintenance, vehicle operation cost , benefits , economic evaluation of highway projects; Highway maintenance and management system, highway asset management system; Highway environment- Noise pollution, air pollution, visual intrusion, community impacts; highway safety audit principles; highway rehabilitation.

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TP.C.2.5 : TRANSPORTATION ECONOMICS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Transport Demand and Supply

Movement, transport and location, transport and economic development; Demand for transport, factors influencing demand; elasticity of demand, measures of elasticity; supply of transport, elasticity of supply; demand forecasting.

Module 2: Costing and Pricing of Transport Services

Fixed and variable cost, joint and common cost, cost allocation, user cost internal cost, external cost, economic cost; Principle of pricing, marginal cost pricing, price discrimination ,operational objectives of pricing; revenues, transport subsidies.

Module 3: Principles of Economic Appraisal

Importance of infrastructure; basic principles of appraisal, benefit valuation, cost benefit analysis, multi criteria analysis

Module 4: Regulation of Transport

Theory of regulation, priorities in transport policies, regulatory reforms, coordination.

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TP.C.2.6 : STUDIO

Studio Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) TRAFFIC LABORATORY AND SOFTWARE APPLICATIONS

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	0
Internal Assessment	50
Total Marks	50

The intent of this course (being part of the studio) is to strengthen the capabilities of the students in use of various instruments available in traffic laboratory. In addition, the students will be trained in the field of GIS using standard software such as ARCVIEW, ARCGIS, etc. and use of standard transport planning and traffic engineering software such as TRIPS, CUBE, VISUM, VISSIM, TRANSCAD,TRANSYT, etc.

(b) COMPREHENSIVE TRAFFIC AND TRANSPORTATION PLAN FOR A CITY

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	200
Internal Assessment	250
Total Marks	450

The objective of this studio exercise is to train the students for the preparation of a comprehensive transport plan of a city. This exercise will involve field data collection on road networks, traffic and travel studies including household surveys, public transport studies, parking and terminal studies, etc. Besides secondary data collection, data collected would be analyzed to assess the existing characteristics and identify various problems and issues. Travel demand models would be developed for the base year and travel demand forecasts would be made finalized based on alternate scenarios of development, and then transport plan and proposals would be formulated.

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THIRD SEMESTER

TP.C.3.1 : TRANSPORT INFRASTRUCTURE DESIGN

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Road infrastructure

Design of roundabouts; Design of grade separated intersection and interchange; design of tunnel roads; Design of bus stops and shelters, bus bays; Parking facilities (surface and multi – level) layout design; design of pedestrian facilities (subways, foot over bridges);cycle tracks; NMT facilities.

Module 2: Rail infrastructure

Rail alignment surveys; Permanent way- rails, sleepers, ballast, sleepers; Curvature of track- types of curves, degree of curvature, super -elevation, transition curves; railway points , crossings and junctions; station yards; terminals- size, parking, circulation, platforms, passenger service and amenities area; metro rail alignment and stations design elements

Module 3: Airports

Airport location planning; Components of air port design; Air side development – runways, taxiways, aprons, air and ground navigation and traffic control aids; Land side development – passenger building, cargo facilities, internal airport circulation and parking; Design of ground access facilities and airport support facilities etc.; land side airport connectivity planning

Module 4: Ports, Docks and Harbour

Harbors - Types, layout, components of harbor- entrance, approach channel, turning basin, sheltered basin, breakwaters, wharves and quays, dry docks, Jetties and piers; Appurtenances to Harbour- Aprons, Transit Sheds, Warehouses, Moorings; Ports- types, components, Seaport location planning and land side connectivity.

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TP.C.3.2 : ANALYTICAL TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Urban Travel Demand

Demand for transportation, microeconomic demand theory, travel demand analysis, disaggregate travel demand models

Module 2: Travel Choice and Inter-city Travel Demand

Measurement of choice, stated preference techniques, willingness to pay, stated discrete choice models- probit models, logit model; calibration of choice models, abstract mode choice, value of time, generalized cost etc.; Intercity travel demand characteristics, approach to intercity demand analysis, direct demand models.

Module 3: Simplified Travel Demand Models

Sketch planning methods, demand estimation from traffic counts, Quick response techniques for travel demand estimation (QRT).

Module 4: Other important techniques and models

Vehicle ownership forecasting, Graph theory application in network analysis, Activity based travel analysis, Land use transport models (LUTM) etc.

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TP.C.3.3 : LOGISTICS AND FREIGHT DISTRIBUTION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Logistics

Logistics concepts, important decision areas in logistics, logistics service providers, legislations, policies and emerging issues affecting logistics, Third party logistics (3PL), just-in- time (JIT), benchmarking, reverse logistics, city logistics, ITS application, e -logistics

Module 2: Freight Demand and Distribution Aspects

Determinants of freight demand, freight demand models, product characteristics, supply chain, distribution channels, and distribution costs

Module 3: Warehouse and Freight Terminals

Warehousing, types of various warehouses, planning and design consideration of warehouses, warehousing cost, inventory models, inventory cost, Planning of Inland Container Depot, Container Freight Stations, Integrated Freight Complex, Logistics hubs etc.

Module 4: Facility Location and Freight Transport Planning

Historical perspectives on facility location, facility location criteria, single and multiple facility location models; Transport modes selection, vehicle route selection models (VRP), vehicle scheduling models (TSP), Transportation Problem, fleet sizing etc.

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TP.C.3.4 : TRAFFIC CONTROL SYSTEM AND ROAD SAFETY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Traffic Signs and Signals Systems

Traffic signs, control aids and street furniture; Types of traffic signal systems -Fixed, vehicle actuated; coordinated control of traffic Signals, phasing and inter green period, saturation flow, optimization of signals

Module 2: Traffic Control and Regulation

Area traffic control, urban traffic control system technology, transportation system management, highway control and incident management, intelligent vehicle highway system, highway surveillance, application of software such as TRANSYT, SCOOT etc. for traffic control and management, Traffic regulation and enforcement.

Module 3: Accident Investigation and Analysis

Overview of accident scenario- national and international; Accident data collection and investigation studies, black spots, collision and condition diagrams; statistical techniques for analysis of accident data

Module 4: Road Safety

Effects of road, vehicle and driver on accidents; safety of vulnerable road users; Planning and design for safety, safety during construction; Road Safety Audit (RSA) – principles, procedures and practice, code of good practice, Checklist, RSA at links and intersections; Traffic calming measures.

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ELECTIVES (SELECT ANY ONE)

TP.E.3.1 : INTELLIGENT TRANSPORT SYSTEM

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Technology and Architecture

Definition, concepts, types of Intelligent Transport System (ITS); ITS technology, software, equipments, architecture.

Module 2: Application in Transport Infrastructure Management

Traffic management, emergency and incident management, public transport system, terminal and depot management system, parking infrastructure management, commercial vehicle management, highway surveillance, case studies.

Module 3: Economics of ITS

Costing of ITS, ITS benefits assessment, economic and financial analysis of ITS.

Module 4: Implementation

ITS implementation, case studies, institutional and organizational issues.

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TP.E.3.2 : ADVANCED TRANSPORTATION ECONOMICS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Basic Concepts of Engineering Economics

Elements of costs, Present worth method, Future worth method, Annual equivalent method, rate of return method, Depreciation, project cash flows, breakeven analysis ,replacement and maintenance analysis , project risks and uncertainity

Module 2: Estimation and Costing of Transport Infrastructure

Estimation and costing of earthwork, excavation, foundation, embankment of highways, flyovers, sidewalks, tunnels , railways , etc,; estimation and costing of drainage and drainage structure; estimation of different items along with machinery, human resources, natural resources

Module 3: Economic feasibility of transport projects

Concept of economic feasibility; estimation of economic costs- project cost, investment strategy, phasing of capital costs, operation and maintenance costs; estimation of economic benefits- benefits to users, non-users **,** benefits to community and economy; economic appraisal- cost benefit analysis, EIRR,NPV **; c**ase studies

Module 4: Financial feasibility of transport projects

Concept of financial feasibility; Project costs- capital cost, O &M costs ;project revenues- toll charges, fare box revenue, advertisement revenue etc. ,financial viability –FIRR; Case studies

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TP.E.3.3 : FINANCING TRANSPORT SYSTEMS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Transport Infrastructure

Characteristics of transport infrastructure, growth trends, investment need and budgetary support, existing financing pattern, financial recurrent expenditure.

Module 2: Transport Costing and Recovery and Alternative Financing Mechanisms

Transport costing, pricing principles, cost recovery pricing, deficits; Financial capital investment, municipal development funds, capital market/debt financing, private sector participation, land as a resource, public private partnership, annuity based approach risk management.

Module 3: Institutional and Regulatory Framework

Risk management, financing institute, fund providers, role and function, documentation and agreement, institutional and regulatory framework implementation.

Module 4: Case studies

Highways and urban roads, Mass transport systems, passenger terminals (rail, bus, air), interchanges, depots, parking complexes, Logistics hubs, etc.

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TP.E.3.4 : REGIONAL TRANSPORT PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Overview of Regional Planning and Regional Transport Systems

Approach to regional planning, types of regions and their characteristics, delineation of region for transport planning; Regional transport system, types, characteristics, regional transport supply, regional traffic and travel pattern, emerging issues.

Module 2: Regional Travel Demand

Regional travel demand determinant, regional demand models, regional accessibility, sequential travel demand models, econometric models, regional public transport demand.

Module 3: Regional Network Analysis

Regional network system, rural road network planning, graph theory applications-connectivity and accessibility measures.

Module 4: Regional Transport Policy

Regional transport infrastructure, system planning imperatives, integration aspects, system selection, policy aspects at regional level.

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TP.E.3.5 : PAVEMENT MATERIALS AND DESIGN

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Materials and Pavement Types

Material used for flexible bituminous and village roads, concrete roads, Material testing on sub grade soil, road aggregates, and bituminous materials and bituminous mixes; Low cost roads, stabilized soil roads, macadam roads, high types bituminous pavement method, design Portland cement and concrete pavement and base course vertical brick and block pavement.

Module 2: Rigid Pavement

Stress in concrete pavement, stress to wheel loads, stress due to cyclic changes in temperature due to moisture content, combination of max tensile stress, thickness design method, tie bar, dowel bar and reinforcement in pavement.

Module 3: Flexible Pavement Design

Different design methods, empirical and semi empirical and practical procedure, thickness design method.

Module 4: Pavement Evaluation and Strengthening

Pavement evaluation- Structural and functional evaluation of flexible pavements, skid resistance, unevenness, roughness; Strengthening- Overlays, types of overlays, overlay design, Benkelman rebound deflection method of evaluating flexible pavements, Need for maintenance, pavement failure, maintenance of earth roads, gravel roads, WBM roads, bituminous surfaces and cement concrete surfaces, special problems of hill road maintenance, maintenance practice in India.

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TP.C.3.5 : STUDIO

Studio Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) ANALYTICAL QUANTITATIVE TECHNIQUES

Studio Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	0
Internal Assessment	50
Total Marks	50

The intent of this course (being a part of the studio) is to strengthen the analytical capabilities of the students in adopting well established methods and techniques in Statistics and Operations Research in their studio projects as well as their research work. The lectures will be supported by use of well established software packages such as SPSS, Mintab, etc.

(b) DETAILED MICRO OR PROJECT LEVEL STUDY ON TRANSPORT INFRASTRCUTURE PLANNING, DESIGN AND MANAGEMENT FOR A CASE STUDY OF URBAN OR INTER-URBAN OR REGIONAL LEVEL

Studio Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	200
Internal Assessment	250
Total Marks	450

The objective of this studio exercise is to train the students for conducting a detailed project level study related to transport infrastructure planning, design and management aspects for a case study at urban, inter-urban or regional level. This exercise will involve relevant field data collection besides secondary data collection. The data collected would be analyzed to assess the existing characteristics and identify various problems and issues. Based on the scope of the study, alternate improvement, planning design and management strategies would be formulated and evaluated by taking into account costs and benefits.

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FOURTH SEMESTER

TP.C.4.1 : TRANSPORT POLICY, LEGISLATION AND INSTITUTIONAL FRAMEWORK

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction

Basic concepts of policy, strategy and tactics, fundamentals of transport policy, theoretical and historical perspectives; principles of transport policy making at local, national and international level.

Module 2: Transport Sector Policies

National transport policies in sectors of road sector, Road transport, railways, civil aviation, ports and shipping; financial outlays in transport sector; National urban transport policy (NUTP); urban bus service provision policies, MRTS policies, NMT policies, Logistics and freight sector policies; PPP in transport sector; International and national case studies on best practices in urban, regional and national transport policies.

Module 3: Transport Legislations and Acts

Road Transport Corporation (RTC) Act, Motor Vehicle Act, National Highway Act; Legislations in Railways, Civil Aviation, Ports sector , Logistics sector, Multimodal Transport Act etc.

Module 4: Institutional Frameworks

Institutional set ups in Roads, Road transport, Railways, Civil Aviation, Ports and Shipping, Metro Rail Corporations, State Road Transport Undertakings, City Bus Undertakings; Urban Transport set up in Municipal Authorities, local bodies etc; UMTA; Special Purpose Vehicles (SPV's), Role of NGO's etc; innovative methods in institutional strengthening, institutional audit and capacity building.

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TP.C.4.2 : PROJECT FORMULATION AND APPRAISAL

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1

- Life cycle of projects
- Project Identification and Formulation
- Project Monitoring and Evaluation

Module 2

- Project Appraisal Techniques
- Financial Cost benefit analysis
- Economic cost benefit analysis
- Social cost benefit analysis

Module 3

- Computer application in Project Formulation
- Sensitivity Analysis Techniques in Project Management

Module 4

- Appraisal Monitoring and Evaluation

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TP.C.4.3 : THESIS

Discussion Hours Per Week	(L) 0+ (T) 24*
Credits	16
End Semester Examination	300
Internal Assessment	500
Total Marks	800

All students are required to select a research topic of their choice in consultation with the faculty and carry out research for a case study based on primary and secondary data, analysis and data interpretation, identification of issues and potentials, conceptualization of plans, policies, proposals as per the scope of the research study and conclude with research findings along with recommendations. At the end of the research, the students are required to submit a thesis report and defend their research findings at an external examination with the aid of appropriate thesis drawings and report.

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M. PLAN / M. TECH. (PLANNING) - SPECIALIZATION IN INFRASTRUCTURE PLANNING AND MANAGEMENT

9

Scheme of Examinations

Name of the Subject		Hrs. Per Week* L + T	Credits	Marks		
				Internal Assessment	End Semester Examination	Total
INTEGRATED FIRST SEMESTER						
Core Subjects						
In. C.1.1	Planning History and Theory	2 + 1	2	50	50	100
In. C.1.2	Socio-economic basis for Planning	2 + 1	2	50	50	100
In. C.1.3	Planning Techniques	2 + 1	2	50	50	100
In. C.1.4	Infrastructure and Transport Planning	2 + 1	2	50	50	100
In. C.1.5	Housing and Environmental Planning	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**
Studio						
In. C.1.6	Studio course	3 + 0	2	100	-	100
Sub-Total		**3+0**	**2**	**100**	**-**	**100**
	Studio Assignments	0 + 12	8			
	Film Appreciation			50	-	50
	Literature Review			50	-	50
	Area Appreciation			50	50	100
	Site Planning			50	50	100
	City Development Plan			50	50	100
Sub-Total		**0 + 12**	**8**	**250**	**150**	**400**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
SECOND SEMESTER						
Core Subjects						
IPM.C.2.1	Project Formulation, Appraisal, Monitoring and Evaluation	2 + 1	2	50	50	100
IPM.C.2.2	Transport Network and Terminals	2 + 1	2	50	50	100
IPM.C.2.3	Infrastructure Pricing and Financing	2 + 1	2	50	50	100
IPM.C.2.4	Infrastructure Development Policies	2 + 1	2	50	50	100
IPM.C.2.5	Information Systems for Infrastructure Planning	2 + 1	2	50	50	100
IPM.C.2.6	**Studio**					
	Module I: Detailed Project Report for a Project	3 + 0	2	50	50	100
	Module II: Comprehensive City Infrastructure Development Plan	0 + 12	8	250	150	400
Sub-Total		**13 + 17**	**20**	**550**	**450**	**1,000**
THIRD SEMESTER						
Core Subjects						
IPM.C.3.1	Infrastructure for Regional Development	2 + 1	2	50	50	100
IPM.C.3.2	Telecommunications and Information Technology	2 + 1	2	50	50	100
IPM.C.3.3	Regional Development Policies	2 + 1	2	50	50	100
IPM.C.3.4	Infrastructure Management	2 + 1	2	50	50	100
IPM.C.3.5	Planning for Special Areas and Mega Projects	2 + 1	2	50	50	100
Sub-Total		**10 + 5**	**10**	**250**	**250**	**500**

IPM.C.3.5	**Studio**					
	Module I: Detailed Project Report for a Rural Infrastructure	3 + 0	2	100	50	150
	Module II: (a) Infrastructure Plan for a Region;	0 + 12	8	200	50	250
	(b) Infrastructure Plan for Rural Area			50	50	100
Sub-Total		**3 + 12**	**10**	**350**	**150**	**500**
Total		**13 + 17**	**20**	**600**	**400**	**1,000**
FOURTH SEMESTER						
Core Subjects						
IPM.C.4.1	Infrastructure Management	2 + 1	2	50	50	100
IPM.C.4.2	Research Methods and Quantitative Techniques	2 + 1	2	50	50	100
IPM.C.4.3	Thesis	0 + 24	16	450	350	800
Total		**4 + 26**	**20**	**550**	**450**	**1,000**
Grand Total		**40 + 80**	**80**	**2,300**	**1,700**	**4,000**

In. stands for Integrated First Semester.

C. stands for Core Subjects and E. stands for Elective Subjects.

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** All students are required to undertake internship after second semester at a selected planning organization during the summer vacations for 6 to 8 weeks and obtain a certificate satisfactory performance.

M. Plan / M. Tech. (Planning) -
Specialization in Infrastructure Planning and Management

SECOND SEMESTER

IPM.C.2.1 : PROJECT FORMULATION, APPRAISAL, MONITORING AND EVALUATION

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Basics of Project Formulation

Concepts of a project; Meaning and significance of project formulation, monitoring and evaluation in urban planning; Classification of projects; Parameters and components of project formulation; Approaches of project formulation.

Module 2: Elements and Techniques of Project Formulation

Elements of project formulation techniques; Life cycle of a project; Stages of project formulation and their significance: identification of a project, techno-economic analysis, feasibility analysis, design and network analysis; Project appraisal and report; Cost-effectiveness, discounted cash-flow analysis.

Network techniques of project management: network logic, rules, forms of network, Critical Path Method (CPM) and Project Evaluation and Review Technique (PERT), Scheduling and Gnatt chart, time estimates and uncertainty in time estimates, degree of variability and probability of completion.

Module 3: Projection Evaluation

Project evaluation: meaning, objective and criteria of project evaluation; Stages and steps of project evaluation; Techniques of project evaluation; Cost-benefit analysis; Financial cost-benefit analysis: terminal cash-flow analysis, treatment of depreciation, salvage value, working capital, time value of money and rate of return; Social cost-benefit analysis of public and private projects; Efficiency and equity trade - off, Measurement of direct and indirect costs and benefits.

Module 4: Computer Application in Project Formulation

Computer application in project formulation, appraisal, monitoring and evaluation: types of packages: MS Project and Time line and its relevance; Application of cost and benefit analysis in developing countries – Case studies in transportation project, urban and rural facilities and utilities; Infrastructure development under JNNURM, NCR and Growth Centers.

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IPM.C.2.2 : TRANSPORT NETWORKS AND TERMINALS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Basics of Transport Network and Terminals

Transport networks and terminals: definitions, scope, relationships and their importance in infrastructure planning in urban and regional context; Integration of networks and terminals with other components of transportation; Characteristics and types of networks and terminals: urban and regional. Concepts, components, importance, norms and design considerations for terminal design: bus, rail, freight transport, air.

Module 2: Road Hierarchy

Road network hierarchy: urban and regional; Concepts, types, elements, norms, design considerations and importance of road geometry; Road side furniture; Intersections and parking in infrastructure planning for road transportation.

Module 3: Road Design Norms and Standards

Elements, norms, design considerations for rail, water and air transport network; Coordination and integration between road, rail, water and air transport network.

Module 4: Traffic Signs

Traffic signs, signals and markings: their types and importance as infrastructure, norms and design considerations; Intelligent transport system: concept, need and importance in transport system management.

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IPM.C.2.3 : INFRASTRUCTURE PRICING AND FINANCING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Public Finance

Meaning and scope of public finance; Sources of public revenue: their nature, scope and limitations; Public borrowings: its objectives, form and scope; Public debt: importance, scope and problems; Public financial institutions: their role and contribution in infrastructure development; Deficit financing; principles and problems of federal finance; Central and state governments financial relations; Central Finance Commission: its role and recommendations.

Module 2: Private Finance

Meaning, scope and forms of private finance; Private debt and market borrowings: objectives, scope and related problems; Loans from banks and financial institutions: prospects and limitations.

Module 3: Financing and Cost Components of Infrastructure

Financing infrastructure development: tax and non-tax revenue of Development Agencies; Loans and grants from financial institutions; Remuneration projects; Making infrastructure development self financing; Privatization and role of private finance in infrastructure development, Public – Private Partnership (PPP).

Cost components of infrastructure development; Socio-economic cost benefit analysis; Cost recovery and affordability; Subsidy and cross-subsidy; Principles of maximum social advantage. Pricing of infrastructure – its rationale and parameter/components; Principles of determining cost and price of infrastructure development to be charged from consumers/users.

Module 4: Financial Resource and Local Governments

Financial resources of local bodies – their nature, scope and limitations; Infrastructure development expenditure of Local Governments; Causes and effects of poor finance health of Municipal Bodies; Various measures to augment financial resources of local bodies; State Finance Commission: its role and recommendations.

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IPM.C.2.4 : INFRASTRUCTURE DEVELOPMENT POLICIES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Infrastructure Policies

Infrastructure Development policy, definition, components, constitutional provisions, central list, state list and concurrent list of jurisdiction, acts, institutional setup, regulatory mechanism, traditional approaches, new approach-public private partnership, infrastructure finance-nature and options. Special Economic Zones: meaning, types, configuration, roles of government and private sector, global scenario, SEZ policy in India,

Module 2: Energy and Power Policies

Energy: Electric power- Current scenario, legal and regulatory framework, electricity act 2003 and related rules, institutional reforms, PPP in electricity sector, FDI, programmes in electrification, 11th five year plan

Module 3: Transport Policies

Transport policy framework, importance of transport policy, railways, roads and surface transport, ports, civil aviation, 11th five year plan provisions

Module 4: Telecommunication Policy

Importance of telecommunications, new telecom policy of India, TRAI, FDI in telecommunications, rural telecommunications, 11^{th} Five Year Plan and telecommunications.

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IPM.C.2.5 : INFORMATION SYSTEMS FOR INFRASTRUCTURE PLANNING

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction and Classifications

Classification of information and data; Information collection - traditional methods, drawbacks, need for alternative technology; Topographical maps – sources, Survey of India (SOI) specifications, Study of SOI grids; Traditional land records - *shajra* plan, revenue record, *jamabandi, intekaal*.

Module 2: Sources of Data

Sources of demographic data - census, statistical abstract and national sample survey; Census of India Series and Tables – primary census abstract, town and village directory, housing tables, migration tables. Municipal Property record.

Module 3: Aerial Photography and its Applications

Aerial photography - concepts, types of aerial photography survey, elements of photo interpretation, photogrammetry- thermal photography, sources, costs.

Applications of aerial photography - physiographical analysis, calculation of heights, land use studies, residential densities, networks, areas prone to flooding, encroachments, open spaces, vegetation covers, development controls, site selection, etc.; Small format aerial photography and its application Aerial photography for disasters management.

Module 4: Remote Sensing and its Applications

Remote Sensing - electromagnetic radiation, spectral signatures, satellite imageries, false color composite (FCC), thermal imagery,; Image processing; Sources of satellite imageries, costs. Application of satellite imageries - broad land use; residential types, vegetation covers, Forest cover, Agriculture development, Settlement pattern, urban growth and fringe areas, water tables and resource planning.

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IPM.C.2.6 : STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	200
Internal Assessment	300
Total Marks	500

(a) Detailed Project Report for a Project

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

The students shall be required to prepare a Detailed Project Report (DPR) for any component/s of city infrastructure as proposed in the Comprehensive City Infrastructure Development Plan prepared in planning practice problem IPW-572. Efforts shall be made to take up the live projects of city infrastructure. The scope of the DPR shall confine to cover all the stages of project preparation including:

- Identification of activities.
- Activity event chart (Network Chart)
- Cost estimation in detail.
- Time-cost chart (Gantt chart)
- Cost recovery plan (if required)

The DPR so prepared shall be presented suitably in form of maps, charts, diagrams, photographs, sketches supported by detailed report for its submission and final evaluation.

(b) Comprehensive City Infrastructure Development Plan

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	150
Internal Assessment	250
Total Marks	400

Students shall be required to undertake the study of existing status of infrastructure in a given town/city. The scope of the study shall confine to the coverage of major components of city infrastructure on following aspects: Physical: Water Supply, Sewerage, Drainage, Solid waste, Street and Street Furniture, etc. Social: Education, Health, Recreation, Community Services, etc. Based on the study and analysis of existing infrastructure, the students shall be preparing a comprehensive City Infrastructure Development Plan. The study along with plan shall be presented suitably in form of maps, charts, diagrams, photographs, sketches supported by detailed report for its submission and final evaluation.

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THIRD SEMESTER

IPM.C.3.1 : INFRASTRUCTURE FOR REGIONAL DEVELOPMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Regional Infrastructure

Definition, types and importance of infrastructure in regional perspective, Status of regional development in India, changing scenario of Infrastructure development, Need for innovative approaches.

Module 2: Integrated Infrastructure Planning

Integrated infrastructure planning process, Regional infrastructure in the context of different types and level of regions. Norms and Standards, Regional infrastructure constraints, current practices for regional infrastructure development.

Module 3: Planning for Regional Infrastructure

Planning for infrastructure in a region – Transport, water resources, telecommunication, electricity, energy resources, agriculture market, fertilizer, implements, research and development, extension services. Planning for infrastructure in a village and its hierarchy – physical, social and economic.

Module 4: Policies and Programmes

Policies and Programs for regional infrastructure development in various Five Year Plans. Regional infrastructure development issues, priorities and strategies in Punjab.

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IPM.C.3.2 : TELECOMMUNICATIONS AND INFORMATION TECHNOLOGY

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Significance of Telecom in Infrastructure Planning

Definition and significance of Telecommunication and Information in development and their implication in infrastructure planning. Types of telecommunication and information technology, Technological and spatial requirements for telecommunications

Module 2: Progress and Demand of Telecommunication

Telecommunications development in the recent past, Demand Estimation for urban areas and rural areas. Role of IT Capacity Assessment, Spatial requirements for Information Technologies Sector.

Technological Developments and their implications on physical/ infrastructure planning and development. Global System for Mobile (GSM), Code Division Multiple Access (CDMA), Fiber Optics, Cable, and Underground Wiring; Other wireless technologies.

Module 3: Role of Private Sector for Telecommunication

Infrastructure required for communication and information technology development. Role of Private Sector in providing Telecommunication infrastructure. Norms and standards for Telecom Exchanges, GSM towers, CDMA towers, Underground and overhead wiring.

Module 4: Telecommunication Regulations and Policies

Regulation and Policy in the Telecommunication; Telecom Policy of India; Recent Issues and trends in promoting Telecommunication;

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IPM.C.3.3 : REGIONAL DEVELOPMENT POLICIES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Regional Planning and Panchayati Raj

Regional Planning and Development; Need and Objectives, Sectoral components of Regional development, Emergence and growth of Panchayati Raj Institutions and its significance in Regional development (with particular reference to 73rd constitutional amendment).

Module 2: Regional Planning and Five Year Plan

Regional Development under five year Plans, National level Policies for Agriculture, Rural Industrialization and Entrepreneurship development policies, Regional Networks (Pradhan Mantri Gram Sadak Yogna (PMGSY)), Tourism, Energy and Environment Programmes under Bharat Nirmaan.

Module 3: Regional Development Policies and Programme

Regional Development Policies and Programmes; Land and Soil Management Programmes, Watershed Development Programmes, Forest Development and Management Programmes, Social and Economic Welfare Programmes, National Rural Employment Guarantee Programme, National Rural Health Mission, National Literacy Mission.

Module 4: Role of Different Development Agencies national and international

Role and functions of Agencies involved in Regional Development at National and International Level: World Bank, Asian Development Bank, Council for the Advancement of Peoples Action and Technology (CAPART), National Bank for Rural and Agriculture Development (NABARD), Housing for Urban Development Housing and Urban Development Corporation Limited (HUDCO), Role of NGO's and Community Based Organizations, Role of Co-operative Institutions.

Public participation Models for Regional and Rural Development; Participatory Rural Appraisals, Rapid Rural Appraisals, Social Mapping, Resource mapping, Focus Group Discussions, and Other Methods, Case studies of Participatory Rural Development Initiatives in India.

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IPM.C.3.4 : INFRASTRUCTURE MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Introduction to Infrastructure Management

Meaning and scope of Infrastructure Development Management; Functions, components, stages and principles of Management in relation to Infrastructure Development, Infrastructure Development Issues at National, Regional and Human Settlement (Urban and Rural) levels.

Module 2: Process and Policies of Infrastructure Development at National Level

Process of decision making for Infrastructure development at National level, Infrastructure Development in India; policies, programmes and provisions in the National Five Year Plans, Recommendations of various committees, task forces and commissions from time to time. Various National level organizations related to Infrastructure Development in terms of their background, functions, powers, setup and resources (with some case studies).

Module 3: Process and Policies of Infrastructure Development at State and Local Level

Process of decision making for Infrastructure Development at State level, State policies; programmes and provisions in the various Five Year Plans, various State level organizations related to Infrastructure development in terms of their background, functions, powers, set-up and resources (with some case studies).

Process of decision making for Infrastructure Development at Human Settlements/local Level, Various local level organizations related to Infrastructure Development in terms of their background, functions, powers, set-up and resources (with some case studies).

Module 4: Role of NGOs and Private Organizations

Role of Non-Government and Private Organizations in Planning and Development of Infrastructure and their relationships with Local and State Governments. Importance and methods of Public-Private Partnership (PPP); Public/Citizen participation in Infrastructure Planning and Development, its scope, methods and limitations.

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IPM.C.3.5 : PLANNING FOR SPECIAL AREAS AND MEGA PROJECTS

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Concept of Mega Projects

Mega projects—concepts: investment based, activity based; Mega projects - types and nature: buildings, roads, environment, irrigation based etc; Related concepts—SEZ, Free Trade Zones, Strategic importance; Mega projects and urban development.

Module 2: Urbanization and Mega Projects

Mega projects and Indian urbanization system: urbanization trends in India and mega projects, guidelines for mega projects at national level, Infrastructure requirements for mega projects; Mega projects and city infrastructure system; Mega projects vis-à-vis city development, Infrastructure requirements for mega projects — specific infrastructures for mega projects.

Module 3: Special Areas and Special Area Projects

Meaning, nature, types and scale of special areas; Special areas as determinant of Urban and Regional Planning and Development; Issues and challenges, resources and constraints of special areas. Infrastructure challenges for the mega special area projects.

Infrastructure Requirements of Contemporary concepts of Special areas : Old City areas, Historic Cores and Heritage based areas, Development of Major access roads of International standards, Areas around Air ports, ports and terminals, Infrastructure policies and programmes for Shopping Malls and Multiplexes, Information Technology Parks, Theme Parks, Special Economic Zone, Free Enterprise Zone, Dry ports and free ports.

Module 4: Case Studies Analysis

Case studies: Preparation of an Infrastructure inventory for a commercial, industrial, institutional, recreational or residential mega projects. Specific Infrastructure details for landscaping around roads— Major arteries, minor and Sector roads, City level parks etc.

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IPM.C.3.6 : STUDIO

Lecture Hours Per Week	(L) 3+ (T) 12*
Credits	10
End Semester Examination	150
Internal Assessment	350
Total Marks	500

(a) INFRASTRUCTURE PLAN OF A REGION

Lecture Hours Per Week	(L) 3+ (T) 0*
Credits	2
End Semester Examination	50
Internal Assessment	200
Total Marks	250

Infrastructure has to be undertaken within the larger developmental perspective. In view of this, the exercise attempts to expose the students with knowledge base related to various sub-section like roads, railways, irrigation, telecom, industrial, agriculture infrastructure, special economic zone, health infrastructure, proper distribution of social facilities and open spaces, consideration for economically weaker section. In addition, issues related to provision of infrastructure services, its costing, financing and Implementation strategies and role of various agencies in realizing the plan are also important. The students will cover various studies (primary and secondary) for the above said sectors to develop perception in understanding and analyzing various issues in the region. After the identification of the problems, potentials, students will formulate an objective and accordingly prepare a detailed infrastructure plan. Students will present a detailed report illustrated with drawing and sketches covering methodology, basis for requirements, norms and standards used for providing the infrastructure for a region.

(b) INFRASTRUCTURE PLAN FOR RURAL AREA

Lecture Hours Per Week	(L) 0+ (T) 12*
Credits	8
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Students will undertake study of a cluster of villages with an objective, to understand the location, spatial and economic linkages of the villages with a focus on the social and physical infrastructure of the villages and also understand the availability and usage of local resources. In the light of above, students will be required to identify the problems and future possibilities for the development of village infrastructure. Students will submit detailed report illustrated with drawing, sketches covering methodology, basis for requirements, norms and standards, used for providing infrastructure for a rural area.

(c) DETAILED PROJECT REPORT FOR RURAL INFRASTRUCTURE

End Semester Examination	50
Internal Assessment	100
Total Marks	150

The students shall be required to prepare a Detailed Project Report (DPR) for any component/s of rural infrastructure as proposed in the Infrastructure Plan of Rural Area prepared in planning practice problem MPI (PP)-313. Efforts shall be made to take up the live projects of rural infrastructure. The scope of DPR shall be confined to cover all the stages of project preparation including:

- Identification of activities.
- Activity event chart (Network chart).
- Cost estimation.
- Time-cost chart (Gantt chart).
- Cost recovery plan.

The DPR so prepared shall be presented suitably in the form of maps, charts, diagrams, photographs, sketches supported by detailed report for its submission and final evaluation.

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FOURTH SEMESTER

IPM.C.4.1 : INFRASTRUCTURE MANAGEMENT

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Definitions of Infrastructure Management

Meaning and scope of Infrastructure Development Management; Functions, components, stages and principles of Management in relation to Infrastructure Development, Infrastructure Development Issues at National, Regional and Human Settlement (Urban and Rural) levels.

Module 2: Process of Infrastructure Development at National Level

Process of decision making for Infrastructure development at National level, Infrastructure Development in India; policies, programmes and provisions in the National Five Year Plans, Recommendations of various committees, task forces and commissions from time to time. Various National level organizations related to Infrastructure Development in terms of their background, functions, powers, setup and resources (with some case studies).

Module 3: Process of Decision Making for Infrastructure Development at State and Local Level

Process of decision making for Infrastructure Development at State level, State policies; programmes and provisions in the various Five Year Plans, various State level organizations related to Infrastructure development in terms of their background, functions, powers, set-up and resources (with some case studies).

Process of decision making for Infrastructure Development at Human Settlements/local Level, Various local level organizations related to Infrastructure Development in terms of their background, functions, powers, set-up and resources (with some case studies).

Module 4: Role of NGOs and Private Organizations

Role of Non-Government and Private Organizations in Planning and Development of Infrastructure and their relationships with Local and State Governments. Importance and methods of Public-Private Partnership (PPP); Public/Citizen participation in Infrastructure Planning and Development, its scope, methods and limitations.

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IPM.C.4.2 : RESEARCH METHODS AND QUANTITATIVE TECHNIQUES

Lecture Hours Per Week	(L) 2+ (T) 1*
Credits	2
End Semester Examination	50
Internal Assessment	50
Total Marks	100

Module 1: Definitions and Basics of Research Methods

Definition and needs of Research, Scientific research and methods, System approach of research, Levels of research: micro and macro. Major steps in the conduct scientific research, induction, deduction and verification. Selection and formulation of research problems, Reviewing of literature.

Module 2: Designing Research and Test of Hypothesis

Designing a research, Pre test and pilot study, Synopsis, and components of synopsis, Hypothesis; meaning, importance and different concept, formulation and testing of hypothesis, Tests of Hypothesis, *z*-test, t-test, *F*-test, *Chi*-square test. Lorenz Curve; Correlation and Regression Analysis - meaning, types, importance, methods of measurement.

Module 3: Process of Theorization and Research Compilation

Definition of Concept, Theory and facts, Process of theorization, Research Compilation and report: contents and style, factors in the organization of a research report, writing of foot notes, quoting styles, references, cross referencing and bibliography.

Module 4: Model in Planning and Management

Meaning and definition of Model, classification of models, Relevance of Growth models and planning models, Difference between growth models and planning models, Process of model application and its scope and limitation, Horrod-Domar Model, Koldar's Model, Mrs. Joan Robinson Model, Solow's Model.

Understanding and evaluation of operational models in terms of their objectives, theoretical structure, mathematical formulation, applications and limitations related: Input-Output Model, Linear Programming, Threshold analysis, simulation of infrastructure. Issues and areas of Infrastructure planning research.

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IPM.C.4.3 : THESIS

Interaction Hours Per Week	(L) 0+ (T) 24*
Credits	16
External Assessment	350
Internal Assessment	450
Total Marks	800

The main objectives of preparing a thesis is to provide an opportunity to each student to undertake original and independent study/research; to explore in depth and to develop a subject of his/her own choice demonstrating the ability to use effectively the tools of independent investigation and judgment. The theme of the thesis should offer scope to adopt a fresh approach in formulating a concept of developing a methodology, effective and useful in the realm of infrastructure planning. Each student shall prepare thesis on a selected topic under the supervision of a guide. The thesis shall be presented in the form of a report well illustrated by maps, drawings, charts, sketches, photographs, model, etc.

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M. PLAN / M. TECH. (PLANNING) - CONSOLIDATED SCHEME OF EXAMINATIONS

Name of the Specialization	Theory Subjects		Lect Hrs Per Week for Theory Subjects*	Total Marks for Theory Subjects			Credits	Studio and Theory Hours for Studios Per Week		Total Marks for Studio/Thesis			Credits	Grand Total	
	Core	Electives		Internal	External	Total		Theory	Studio/ Thesis	Theory	Practical	Total		Marks	Credits
Integrated First Semester (Common to all)	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
(UP) Urban Planning															
Second Semester	4	1	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	4	1	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(RP) Regional Planning															
Second Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(EP) Environmental Planning															
Second Semester	4	1	8 + 8	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(H) Housing															
Second Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(TP) Transportation Planning															
Second Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**50**	**450**	**500**	**10**	**1,000**	**20**
Third Semester	4	1	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**50**	**450**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**
(IPM) Infrastructure Planning and Management															
Second Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**100**	**400**	**500**	**10**	**1,000**	**20**
Third Semester	5	0	10 + 5	**250**	**250**	**500**	**10**	**3**	**12**	**50**	**450**	**500**	**10**	**1,000**	**20**
Fourth Semester	2	0	4 + 2	**100**	**100**	**200**	**10**	**0**	**24**	**-**	**800**	**800**	**10**	**1,000**	**20**

*includes both lectures and tutorials.

**Internship Training to be completed during the summer vacations.