Annex-II

of Academic Council Meeting
of SPAV held on 18.06.2015

Master of Planning

(Environmental Planning and Management)

Course Structure and Syllabus for
Two Year Masters Degree Programme in Planning

(As approved by the
Academic Council of SPAV on its V Meeting held on June 18, 2015
and
Board of Studies in Planning on its Meeting held on November 18, 2014
and ratified on March 07, 2015 at SPAV Nidamanuru campus)

(Effective from Academic Year 2014-15)

योजना तथा वास्तुकला विद्यालय, विजयवाडा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA.

Introduction to
Master of Planning (Environmental Planning and Management)

Master of Planning (Environmental Planning & Management), abbreviated as M.Plan (EPM), is a two year full time Masters degree programme in planning offered by School of Planning and Architecture, Vijayawada specialising in Environmental Planning and Management.

The overall aim of the programme is to rationally sensitise the students towards the intricate ecological relationship between nature and human settlements and thereby equip them with adequate skills required to comprehend, analyse and plan for urban and regional issues with the pretext of maintaining Environment Quality and ecological balance. This broad aim intrinsically shall involve comprehension of physical, socio-economic, cultural, political and ecological dimensions of the human settlements. It shall focus particularly in recording and interpreting environmental resource baseline and their local and regional capacities to deal with human needs.

The course structure and syllabus of the M.Plan (EPM) programme is designed in coherence with the *Model Curriculum for M.Plan / M.Tech (Planning), All India Council for Technical Education, 2011*. M.Plan (EPM) programme is divided into four semesters where each semester has a combination of planning studio, lab-based subjects and theory courses.

The **first semester** is an integrated semester common to all master courses of planning offered by the School. It introduces the fundamentals aspects of planning, such as planning techniques, housing, environment, infrastructure, transportation, socio-economic elements and information systems for planning. The studio focuses on the area appreciation and mapping techniques. The **second semester** is aimed to inculcate the core specialised competencies of environmental planning in terms of theories and tools like use of environmental monitoring lab, theory of environmental planning, ecological footprint analysis, environmental economics, waste water treatment, planning for healthy cities, etc. The studio aims to take up a small or medium town with development challenges and local/urban environmental issues. It offers two electives, out of which students are expected to select one.

The **third semester** focuses on regional environmental planning issues and imparts advanced level theory courses like EIA techniques, water and energy studies, and environmental law and professional practise. This semester also introduces project planning and management tools and focusses on waste management and climate change as electives. The students are expected to develop their thesis ideas in the semester through the advanced research methodology course. The **fourth semester** requires the student to undertake thesis with an emphasis on academic or applied research. In addition, two theory subjects are offered on environmental justice, and environmental policy and governance.

Each subject is divided into four sections consisting of the subject details, objective, units and suggested readings. The subject syllabus is broken into progressive sections through the units, to be taught over the semester. However, it may be noted that the syllabus covered is not exhaustive and the individual subject teacher may augment the syllabus as per his/her perception of the subject with prior concurrence of the Head of the Department. The five underlying principles of 'Sustainability, Equity, Efficiency, Harmony, and Safety' are to be emphasized as a cross-cutting theme in executing planning lab/studio exercises and application of theory subjects.

The syllabus is designed so as to develop strong communication, interpersonal, advocacy and analytical skills of the student. The course endeavours to give real time experience to students through their involvement in the ongoing or live projects. The programme is designed to enable the growth of the students into professionals in the field, who are not only environmentally sensitive in their planning approaches but are versed with the know-how of the state-of-the-art techniques in the industry.

First Semester (Integrated)

Code	Course Titles	Distribution of Marks				Distribution of Periods per week			Credits
		IA	EE	EJ	TM	L	P	TP	
MPIS102	Introduction to Information Systems	50	-	50	100	0	3	3	3
MPIS103	Evolution of Human Settlements and Planning	50	50	-	100	3	0	3	3
MPIS104	Planning Techniques and Quantitative Methods	50	50	-	100	3	0	3	3
MPIS105	Habitat and Environment Planning	50	50	-	100	3	0	3	3
MPIS106	Infrastructure Planning	50	50	-	100	3	0	3	3
MPIS107	Socio-Economic Dimensions in Planning	50	50	-	100	3	0	3	3
MPIS101	Area Planning Studio	200	-	200	400	0	12	12	12
	TOTAL	**500**	**250**	**250**	**1000**	**15**	**15**	**30**	**30**

Second Semester

Code	Course Title	Distribution of Marks				Distribution of Periods per week			Credits
		IA	EE	EJ	TM	L	P	TP	
MPEP202	Applications of Geoinformatics	50	-	50	100	0	3	3	3
MPEP203	Environmental Monitoring & Assessment Tools	50	-	50	100	0	3	3	3
MPEP204	Theory of Environmental Planning & Design	50	50	-	100	3	0	3	3
MPEP205	Environmental Economics	50	50	-	100	3	0	3	3
MPEP206	Infrastructure for Environmental Planning & Management	50	50	-	100	3	0	3	3
MPEP201	Urban Environmental Planning Studio	200	-	200	400	0	12	12	12
	ANY ONE								
MPEP211	Elective 1: Ecological Footprints Analysis	50	50	-	100	3	0	3	3
MPEP212	Elective 2: Advanced Water and Wastewater Treatment	50	50	-	100	3	0	3	3
MPEP213	Elective 3: Planning for Healthy Cities	50	50	-	100	3	0	3	3
MPEP214	Elective 4: From other Master programmes (same semester)	50	50	-	100	3	0	3	3
	TOTAL	**500**	**200**	**300**	**1000**	**12**	**18**	**30**	**30**

IA = Internal Assessment; EE = End Evaluation; EJ = External Jury / Viva Voce
TM = Total Marks; L = Lecture Periods
P = Practicals/ Lab/Workshop Periods; TP = Total Periods

MPIS104 is to be read as:
MP = M.Planning; IS = Integrated Sem; 1 (1st digit) = 1st Sem; 0 (2nd digit) = Subject; 4 (3rd digit) = 4th Subject.

MPEP212 is to be read as:
MP = M.Planning; EP = Environmental Planning; 2 (1st digit) = 2nd Sem; 1 (2nd digit) = Elective Subject; 2 (3rd digit) = 2nd Elective Subject.

Note: Compulsory summer professional training / internship (four weeks) after second semester

Third Semester

Code	Subject Title	Distribution of Marks				Distribution of Periods per week			Credits
		IA	EE	EJ	TM	L	P	TP	
MPEP302	Advanced Research Methods	50	-	50	100	0	3	3	3
MPEP303	Environmental Law & Professional Practice	50	50	-	100	3	0	3	3
MPEP304	Environmental Impact Assessment Techniques	50	50	-	100	3	0	3	3
MPEP305	Project Planning & Management	50	50	-	100	3	0	3	3
MPEP306	Energy Studies	50	50	-	100	3	0	3	3
MPEP301	Regional Environmental Planning Studio	200	-	200	400	0	12	12	12
	ANY ONE								
MPEP311	Elective 1: Human Settlements and Climate Change	50	50	-	100	3	0	3	3
MPEP312	Elective 2: Waste Management	50	50	-	100	3	0	3	3
MPEP313	Elective 3: From other Master programmes (same semester)	50	50	-	100	3	0	3	3
	TOTAL	**500**	**250**	**250**	**1000**	**15**	**15**	**30**	**30**

Fourth Semester

Code	Subject Title	Distribution of Marks				Distribution of Periods per week			Credits
		IA	EE	EJ	TM	L	P	TP	
MPEP402	Environmental Justice	50	50	-	100	3	0	3	3
MPEP403	Environmental Policy and Governance	50	50	-	100	3	0	3	3
MPEP401	Environmental Planning Thesis	400	-	400	800	0	24	24	24
	TOTAL	**500**	**100**	**400**	**1000**	**6**	**24**	**30**	**30**

IA = Internal Assessment EE = End Evaluation EJ = External Jury / Viva Voce
TM = Total Marks L = Lecture Periods
P = Practicals/ Lab/Workshop Periods TP = Total Periods

MPEP302 be read as:
MP = M.Planning; EP = Environmental Planning; 3 (1st digit) = 3rd Sem; 0 (2nd digit) = Subject; 2 (3rd digit) = 2nd Subject.

Note: Credits for each subject are the same as the number of lecture /practical hours per week, whichever is higher.

First Semester (Integrated)

MPIS102 Introduction to Information Systems

Number of Credits	3	Subject Category	Lab
Lecture Periods/Week	0	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	3	External Jury	50
Total Periods/Week	3	Total Marks	100

Objective: To make aware of the information systems and develop basic computing skills relevant to planning.

Unit 1: Information System Concepts and Components

Definition of Information Systems; functions of an information system; components, hierarchy, types, flows, loops; introduction to DBMS.

Unit 2: Information Systems for Planning

Systems approach to planning, use of information systems for planning, CAD, GIS, Remote Sensing, City Engine and other relevant softwares.

Unit 3: Data Sources

National Urban Information System (NUIS), National Spatial Data Infrastructure, Natural Resources Data Management System, Bio-diversity information System; Indian Bio resource information Network, Water Resource Information System (WRIS), Environmental Information System; Bhuvan; National Remote Sensing Centre; Indian Space Research Organization; Census of India, National Sample Survey Organisation (NSSO), Directorate of Economics and Statistics, University Consortium for Geographic Information System (UCGIS); standardization of software, Open Geospatial Consortium(OGC) , GIS libraries; GDAL/OGR, Central Statistical Office (CSO), Archaeological Survey of India (ASI), National Family Health Survey (NFHS), Pollution Control Boards, Meteorology.

Unit 4: Information and Communications Technologies

Introduction to computer hardware and software. Communications technologies and Networks; Servers and its types; data storage systems, files and databases; Operating software; applications packages and user written programs; Open source and proprietary GIS software; Web GIS and Location Based Services.

Unit 5: Future Information Systems

Cloud computing; Characteristics and Components; 3D visualization; Big Data Management; Online Analytical Processing; Data Warehousing and Data Mining; Data Sharing and Security.

Suggested Readings:

1. Richard G., and McLaughlin J (2010), *Geospatial Data Infrastructure Concepts, Cases and Good practice*. Oxford Unviersity Press, Oxford.
2. Government of India (2008), *NSDI Metadata standard-NNRMS Secretariat*, Department of Space, India.
3. J.K.Berry (1996), *Beyond Mapping; Concepts, Algorithms, and Issues in GIS*. Wiley Publications, London.
4. Laudon, K., & Laudon, J. (2014), *Management Information Systems. (13 ed.,)*. Saddle River: Prentic Hall publications, New Jersey.

MPIS103 Evolution of Human Settlements and Planning

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To equip the students with the required knowledge of conventional and contemporary planning thought, pluralistic nature of values in the profession, planning approaches and models. Focus would be on integrating procedural and substantive elements of planning theory to current and future planning practices.

Unit 1: Planning Concepts

Settlement systems, Classification of settlements, primate city, central place concept, concepts of complementary area, central goods and services, range, threshold etc; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; push and pull factors; migration; need for planning; Scalar arrangements in Planning (regional, mega, metro regions, city and local area plans).

Unit 2: Rational Planning Approaches and Models

Systems approach to planning; Comprehensive development plan; Pluralism in planning; Strategic planning; Structure plans; Incremental planning; Equity based planning; Inclusive planning; Feminist planning theory. Participatory planning – Collaborative and communicative planning; local area plans, phasing of plan, integration with five year plans, annual plan, etc. Models - Gravity model; Intervening opportunity models; Political economy model; New economic geography models & globalisation models.

Unit 3: Techniques of Plan Preparation

Surveys, Techniques of conducting surveys for land use, building use, density, structural condition of buildings, heights of building, land utilization and physical features of land; Techniques of mapping – methodologies, physical surveys, land use classification, base map preparation for various levels of plans. Data requirement for various types of plans; Planning standards and regulations – Spatial standards, performance standards and standards for utilities, URDPFI guidelines, development control regulations.

Unit 4: Methods and Tools

Analytical methods - linear programming, threshold analysis, simulation, rank size rule, scalogram, sociogram, cluster and factor analysis, delineation techniques, SWOT analysis; demographic analysis; location models, gravity models.

Unit 5: Emerging and Future Trends

Emerging school of thoughts and doctrines; Recent and contemporary contributions to the changing planning paradigms; Planning for future and in future - vision development, strategising, Implementation of planning policies and development plans.

Suggested Readings:

1. Baker, M. (2001), *Some Reflections on Strategic Planning Processes in Three Urban Regions*. Planning Theory and Practice, 2, (2), pp. 230-235.
2. Faludi. A (1973), *Planning Theory;* Pregamon Press, Oxford, England, U.K.
3. Friedman, J (2005), *The World is Flat: A Brief History of 21st Century;* Farrar, Straus and Giroux publishers, NY.
4. Lane, M. B. (2005), *Public Participation in Planning: An Intellectual History*, Australian Geographer, 36(3), 283-299.

MPIS104 Planning Techniques and Quantitative Methods

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: *To acquire proficiency in statistical techniques and able to conduct empirical studies employing statistical software*

Unit 1: Introduction to Statistical Methods

Statistical data - Types of data: nominal, ordinal, interval and ratio; Discrete versus continuous data; Numerical data – properties and measures; Standard notation; Data collection, coding and decoding, methods, tabulation and graphic presentation of data; Frequency distribution; Measures of central tendency- mean, median, mode; Measures of dispersion – range, variance, standard deviation, skewed distribution, kurtosis; Introduction to spread sheets and statistical software.

Unit 2: Probability, Sampling distributions and Testing of Hypothesis

Introduction to probability; Discrete random variables and probability distribution; Sampling distributions–T and F distribution. Tests of hypothesis- type I & II errors, one-tailed and two tailed tests, chi-square test, student T test.

Unit 3: Correlation and Regression

Correlation – scatter plot diagrams, correlation coefficients, simple correlation, partial correlation; Least square method; Assumptions of regression analysis, linear regression, multiple regressions; Dummy variables; Functional forms; Binary dependent variables; Instrument variables; Time series analysis.

Unit 4: Application of Vital Statistics in Spatial Planning.

Elementary association models and decision making; Index Numbers, weighted and un-weighted index numbers; Application of index number in spatial planning; calculation techniques of vital events.

Unit 5: Demography

Methods of demography and population studies – population projections, introduction to Census data and sample surveys.

Suggested Readings:

1. Agarwal B L (2007), *Programmed Statistics.* New Age International Publishers, New Delhi.
2. Alan C. Acock (2012), A *Gentle Introduction to STATA*. Revised Third Edition.
3. Gupta and Gupta (2012), *Business Statistics*. Sultan Chand and Sons, Delhi.
4. Wooldridge (2011), *Introductory Econometrics: A Modern Approach.* Thomson Press, Noida.

MPIS105 Habitat and Environment Planning

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To give insights on global and local issues of environment concern and introduce fundamental concepts and policies related to housing.

Unit 1: Components of Nature and Ecology

Meaning and components of nature; Basic concepts of ecology, process of flow of material, water, energy, invasion, succession, perdition, regulatory forces, adaptation, tropic levels, food chains, food web, ecological pyramids; Ecology and their relevance to planning; Modifications in natural environment, causes and consequences.

Unit 2: Global & Local Concerns for Environment

Evolution of human settlements; Civilizations and impact on environment; Contemporary environmental discourse; Green agenda and brown agenda; Global environmental movement; Environment and poverty; Environmental management and environmental planning; Global warming, climate change; Biological diversity; Brunt land's Commission's Report; Agenda 21; Club of Rome Report; UNEP charters.

Unit 3: Environmental Resources: Consumption, Conservation and Recycling

Environmental resources and ecosystem services; Concepts of natural reserves; Consumption, conservation and recycling of resources; India's environmental programmes; Government of India's policies relating to forest, wildlife, hill, water resources, wastelands, hills, coastlines, oceans, etc.

Unit 4: Housing and Built Environment

Significance of housing in national development goals; Housing as a basic entitlement - core issues of housing, factors affecting residential location, theoretical knowledge of ecological, neo-classical, institutional approach to housing; estimating housing shortage, housing need, current methods of demand assessment, typologies of housing, housing norms; Densities and standards; Urban sprawl and environmental damages; Gender based planning of neighbourhoods and human settlements.

Unit 5: Housing Sectors, Acts and Policies

Affordable Housing; Housing for the low income groups – slums and squatter settlements, investment in housing in public and private sectors; Cooperative housing, objectives and principles, management and financing of housing projects; Acts, policies and programmes; Comparative policy analysis.

Suggested Readings:

1. Centre for Science & Environment (2006), *State of India's Environment – A Citizen Report,* CSE, New Delhi.
2. Charles Correa (2000), *Housing and Urbanisation.* Thames and Hudson, New York.
3. Glenn H. B. (1966), *Housing and Society.* The Macmillan Company, New York.
4. Pachauri, R. K (1999), *Looking Back to Think Ahead.* TERI, New Delhi.

MPIS106 Infrastructure Planning

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To provide exposure to infrastructure and its sub-sectors relevant to physical planner in planning and design of urban and regional Infrastructure.

Unit 1: Introduction to Infrastructure Planning

Importance of infrastructure, objectives of the utilities, services planning and implications on public health and environment; Economic - introduction to policies and programmes in infrastructure planning; Issues and concerns of maintaining the utilities and services, need and importance of service level benchmarks of water supply, sanitation, sewerage, solid waste and transportation.

Unit 2: Physical Infrastructure

Role of physical planner in planning of utilities and services; Water supply distribution system, storm water drainage system, sewerage system, solid waste management, electricity distribution system.

Unit 3: Social Infrastructure

Types of social infrastructure; Health care - essential service, availability, access and utilisation, standards, public and private institutions, policies, National Rural Healthcare Mission, hierarchy of health care establishments; Education - primary and secondary educational institutions, standards, policies, right to education (RTE); Public and community spaces – recreational, safety and security.

Unit 4: Transportation

Introduction to transport and travel; Understanding travel from the mobility, economic, social-psychologist, time/space perspective; Transportation planning process; Introduction to four stage modelling; Land use and transportation integration; Demand and supply of transport; Congestion pricing, transit orient development; Transport Pricing, Basic transport economic model.

Unit 5: Emerging and Future Infrastructure

Spatial data as infrastructure; Impact of technology on infrastructure; other concepts, components and frameworks.

Suggested Readings:

1. Dinesh M, Omer T, Michael S, Michael J, (2009), *Road Safety in India: Challenges and Opportunities*. University of Michigan, Transport Research Institute. (http://tripp.iitd.ernet.in/DM_UMTRI-2009-1[1].o.pdf)
2. Government of India, (2010), *Service level benchmarks for urban transport* . Ministry of Urban Development. http://urbanindia.nic.in/programme/ut/Service_level.pdf)
3. Jaun de Dios Ortuzar, Luis G.Willumsen, Wiley, (2011), *Modelling Transport* (4th Edition), Routledge.
4. Jean-Paul Rorigue, Claue Comtois, Brian Slack, (2006), *The Geography of Transport Systems*. Routledge.

MPIS107 Socio-Economic Dimensions in Planning

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To provide exposure to concepts, theory and issues relating to socio-economic aspects towards planning of settlements. Also provide understanding of the society and the economy of the nation and its importance in spatial planning.

Unit 1: Introduction to Sociology

Definition and scope of sociology; Concepts of sociology-society, social systems, social structure, institution and organization; Concept of space and people; Sociology and planning.

Unit 2: Social Groups, Social Issues, Rural and Urban Sociology

Contemporary sociological theories; Social structure and social change; stratification and social inequality; Introduction to agrarian, industrial and modern society and spatial formation; Linking social structure and physical structure of village and urban settlements; marginality, vulnerability, social inclusion and exclusion; Inequality and equity; Children youth and gender centred planning.

Unit 3: Applied Economics – Goods and Services

Definition of economics - terms used in economics related to urban and regional planning (URP); central problems of economics; Basics of micro and macroeconomics; use of economics in planning; Definition of need, demand, and supply; Law of demand and supply, types of demand; Theory of demand and utility; Elasticity of demand and supply- its use in planning; Types of economics and their application in spatial planning.

Unit 4: Land Economics

Economic concepts of land, objectives and scope of land economics, relevance for spatial planning; Economic principles of land uses; Economic rent, land use and land values, market mechanism and land use pattern.

Unit 5: Economics of Location and Planning.

Analysis of location of specific uses like residential, industrial, commercial and institutional in the light of location theories in intra-regional and inter-regional context; Techniques of cost-benefit analysis of urban development programme.

Suggested Readings:

1. Benjamin S (2008), *Occupancy Urbanism: Radicalizing Politics and Economy beyond Policy and Programs*, International Journal of Urban and Regional Research, Vol. 32.3, September, 719-729.
2. Brenner N and Theodor N (2002), *Cities and Geographies of "Actually Existing Neoliberalism"*, Antipode, Vol. 34, Issue 3, 349-379.
3. De Souza M (2010), *Which Right to Which City? In Defense of Political- Strategic Clarity*. Interface, Vol. 2(1), May, 315-333.
4. Jan L, Christopher M. (2012), *The Urban Sociology Reader*. Routledge, London.

MPIS101 Area Planning Studio

Number of Credits	12	Subject Category	Studio
Lecture Periods/Week	0	Internal Assessment	200
Practicals /Lab/Workshop Periods/Week	12	External Jury	200
Total Periods/Week	12	Total Marks	400

Objective: To enable the students to understand the socio-economic and political context along with the land-use dynamics of the study area in relation to the village and the city. The focus of this studio will be to develop the students' skills in area appreciation and mapping techniques.

Area appreciation studies at the village, neighbourhood and sub-city levels to gain exposure on the socio-economic, spatio-cultural, environmental characteristics and related issues. The emphasis would be on the preparation of plan through comprehensive surveys, observation studies, interviews and analysis. The end goal would be to plan for rational physical and socio-economic interventions for sustainable and harmonious development of the future.

Literature and Documentary Review (Two weeks): Search and review of relevant literature.

Village Planning (Two weeks): Preparation of plans for the identified village/s by studying the physical, socio-economic, environmental and governance aspects. Understanding how development impacts villages and the communities. Appreciating the need for balancing development with sustaining the livelihoods of rural communities and draw plans for suggested interventions for the community.

Neighbourhood Planning (Ten weeks): Preparation of neighbourhood plan considering different user groups. This may also involve the preparation of residential / site plans (low and high density) preferably for areas where new developments are coming up.

Area Appreciation at the sub-city level (Two weeks): Understanding the linkages between different aspects of socio-economic life in relation to the land-use in the cities. Preparation of area profiles in the city, such as residential, commercial, recreational, industrial, slum area and institutional area. Studying impact of landuse, economic and socio-cultural activities on the physical environment of the area.

Students need to understand the need for a balanced development with incorporation of elements like sustainability, livelihood, environmental protection, inclusive growth and institutional engagement. In addition, emphasis will be given for enhancing the communication skills of the students.

Suggested Readings:

1. Government of India (2015), *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines*. Vol. 1, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi.
2. Manitoba Intergovernmental Affairs and City of Winnipeg's Planning, Property and Development, Department of Planning and Land Use Division (2002), *A Guide for Developing Neighbourhood Plan*.
3. R.Thomas Russ (2009), *Site Planning and Design Handbook*. Mcgraw Hill Publications.
4. Singh.K (2009), *Rural Development Principles, Policies and Management.* Sage Publications, Pvt. Ltd, New Delhi.

Second Semester

MPEP202	**Applications of Geoinformatics**		
Number of Credits	3	Subject Category	Lab
Lecture Periods/Week	0	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	3	External Jury	50
Total Periods/Week	3	Total Marks	100

Objective: Introduce the fundamental concepts of geo-informatics, the associated scientific tools, and their relevance and applicability in urban environmental planning.

Unit 1: Introduction to Geoinformatics

Definitions of geoinformatics and Geographic Information Systems (GIS); the concept of earth surface projections and geoids; Limitations of DBMS, engineering drawings and CADD packages – the need for GIS.

Unit 2: Components of GIS and Remote Sensing

Introduction to Remote Sensing concepts; Acquisition of Images; Image classification; Digital Image processing; Visual and Digital interpretation; Spectral reflectance of earth surface features; Components of a GIS; understanding spatial and attribute data as part of GIS, input and output; Geo-referencing; spatial data entry; data structure for GIS;

Unit 3: Raster and Vector Based GIS Systems

NDVI Classification; Proximity Analysis; Interpolation; Density analysis; Surface Analysis; Clipping; hill Shading View shed Analysis; slope and aspect calculation; 3D modeling; digital Elevation modelling; Terrain modelling; Grid and sieve analysis; Raster Calculation; Buffering and overlaying.

Unit 4: Applications of GIS in Natural Resource Management

Resource Assessment; Impact Assessment; Pollution Monitoring; Damage Assessment Land use Land cover assessment; Wetland mapping; Agricultural Resource development mapping; Forest and wild life habitat Assessment; Water Resource Development Mapping; Energy Resource Management; Mapping of forest; Mapping and modelling landslide, floods, Cyclones Forest fire and drought.

Unit 5: Applications of GIS in Urban Areas

Urban Hazard Analysis; Estimation of Surface Temperature, Surface Water Pollution, Air pollution, Ground water pollution; Land Pollution; Flood control Planning; Assessment of Storm water Runoff; Vulnerability Assessment for earthquake hazard

Suggested Readings:

1. David J. M, Micheal F G and David W R (1991), (Eds.), *Geographical Information Systems – Principles and Applications. Volume I & II.* John Wiley Sons. Inc., New York.
2. Lilles and Keifer (2004), *Remote Sensing and Image Interpretation*. John Wiley and Sons, New York.
3. Singh R.B. (1992), *Environmental Monitoring: Applications of Remote Sensing and GIS.* Geocartho International Centre, Hong Kong.
4. William K.P. (2001), *Digital Image Processing.* John Wiley & Sons, New York.

MPEP 203 Environmental Monitoring & Assessment Tools

Number of Credits	3	Subject Category	Lab
Lecture Periods/Week	0	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	3	External Jury	50
Total Periods/Week	3	Total Marks	100

Objective: Familiarisation of relevant instruments/equipments and procedures related to checking of quality of air, water and soil.

Unit 1: Physio-Chemical and Biological Analysis of Water-I

Understanding of relevant instruments/equipments and procedures for determination of; Colour, Temperature, Turbidity, Odour, pH, Acidity, Alkalinity, Electrical Conductivity (E.C), Total Solids (TS), Total Dissolved Solids (TDS), Total Hardness.

Unit 2: Physio-Chemical and Biological Analysis of Water-II

Understanding of relevant instruments/equipments and procedures for determination of; Nitrates, Phosphates, Sulphates, Chlorides, Fluorides, Potassium and Sodium; Heavy metals such as Lead, Copper, Nickel, Iron, Chromium etc.

Unit 3: Physio-Chemical and Biological Analysis of Water-III

Understanding of relevant instruments/equipments and procedures for determination of; Dissolved Oxygen (D.O), Biological Oxygen Demand (BOD), and Chemical Oxygen Demand (COD) .The biological parameters involved in the qualitative analyses of planktons (zooplankton and phytoplankton).

Unit 4: Weather, Soil and Air Quality Parameters

Understanding of relevant instruments/equipments and procedures of air quality (High Volume Sampler, Handy Sampler, Noise Meter, Spectrophotometer etc) - TSPM, RSPM, SO2, NOX, Stack Monitoring, Noise Level Measurements etc.; Understanding of relevant instruments/equipments and procedures related to Soil quality - pH, EC, soil moisture, Phosphate, Potassium, Sodium, etc. Understanding of relevant instruments/equipments and procedures with respect to Weather - temperature, relative humidity, rainfall, wind direction and speed, etc.

Unit 5: Case Studies

Individuals shall select a particular sector/issue or topic within the fields of environmental planning on the above parameters in any of their case areas and conduct limited research on the same. The outcome shall be a short research paper (about 10 pages) or a presentation, which showcases the researcher's viewpoint presented.

Suggested Readings:

1. Garg, S.K. (2005), *Environmental Engineering*. Vol.1 Khanna Publishers, New Delhi.
2. Modi, P.N. (2005), *Water Supply Engineering.* Vol. I Standard Book House. New Delhi.
3. Punmia, B.C., Jain A K, and Jain A K. (2005), *Water Supply Engineering.* Laxmi Publications (P) Ltd., New Delhi.
4. Trivedi P. R. (2012), *Environmental Pollution and Control.* APH Publishing Corporation, N Delhi.

MPEP204 Theory of Environmental Planning & Design

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To establish detailed understanding of theories relating to environmental planning approaches and paradigms.

Unit 1: Historical Approach to Environmental Concerns

Development of habitat patterns and dependence on natural resources; Earliest forms of environmental concerns; Evolution of environmentalism; Characteristics and differences of urban environment and rural environment; urbanisation and its implications on environment at different scales.

Unit 2: Growth of Environmentalism

Club of Rome report; Tragedy of Freedom of Commons; Environmental determinism concepts; Industrial Ecology concepts; Ecological modernisation concepts, ecology concepts: environmental lessons from the developed economies; Bruntland's Report; Role of laws and legislations in environmental stewardship.

Unit 3: Land Capability and Resource Depletion Analysis

Land as a threat and resource; Land capability analysis within the ecological context; Multi criteria decision analysis for planned transformation of land; social implications of ecologically sensitive land transformation; Assessment of various ecosystems and development imperatives (land, geology, soil, climate, water, vegetation) characteristics; Exploitation, causative factors for environmental degradation.

Unit 4: Poverty and Environmental Management

Role of economic deterioration vis-à-vis environmental degradation; types of urban environmental problems, Green and Brown Agenda environmental problems; NIMBY concepts; Managing environmental concerns through industrial and scientific innovation, traditional and indigenous coping techniques to environmental hazards; Ecological planning tools and techniques.

Unit 5: Design as a Determinant of Ensuring Environmental quality

Evolution of Environmental design for urban and regional context; Rising material consumption; Zoning of environmentally sensitive areas; Design with nature; Energy efficiency in urban planning; Components of Urban climatology, urban heat island and its spatial links.

Suggested Readings:

1. Honachefsky W B. (2000), Ecologically Based Municipal Land Use Planning. Lewis Publishers, London.
2. Lien, J. K. (2003), *Integrated Environmental Planning*. Blackwell Publishing. Oxford.
3. Ndubisi, F. (2012), *Ecological Planning*. John Hopkins University Press, Maryland.
4. Randolf, J. (2012), *Environmental Land Use Planning & Management.* Island Press, Washighton.

MPEP205 Environmental Economics

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To aware theoretical base for applying economic concepts to environmental issues.

.

Unit 1: Natural Resource and Economics

The Economies of resources - natural, renewable and non-renewable, man-made resources; Methods of valuation and quantification

Unit 2: Values and Assessment of Ecosystem Services

Determining environmental values and ethics – User based perspectives; Quotas; Myopic optimal values; Principle of optimal control, arriving at threshold values of consumption.

Unit 3: Pricing Mechanisms – Exhaustible Resources

Consumption patterns and its relation; non-renewable resource as a component of GDP, fiscal deficit and PPP; Deriving rents from exhaustible resources, pricing of exhaustible resource; Role of subsidy in non-renewable resources; Non-renewable resource problem: Steady states, conditions, Euler's equation, maximization problems.

Unit 4: Pricing Mechanisms – Renewable Resources

Renewable resources: principles, theory, estimation, valuation; Case material discussion; Trends in prices and stock depletion.

Unit 5: Economies of Wastes and Energy

Waste as resource; waste as tool for revenue; Waste to energy; energy needs and its implication to economic development.

Suggested Readings:

1. Meadows D H, Randers J., Meadows D L.; (2012), *The Limits to Growth. The 30 Year Update.* Chelsea Green Publishing, Vermont.
2. Perman R, Ma Y, (2011), *Natural Resource and Environmental Economics.* Addison Wesley, New York.
3. Schumacher E F. (1999), *Small Is Beautiful: A Study of Economics As If People Mattered.* Blond and Briggs, New York.
4. White B., Hanley N, (2013), *Introduction to Environmental Economics.* OUP, Oxford.

MPEP206 Infrastructure for Environmental Planning & Management

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To acquire knowledge on the fundamental concepts urban physical infrastructure components and planning.

Unit 1: Introduction, Basic Concepts and Theories

Role of physical planner in planning of utilities and services; objectives of utilities and services planning and implications for public health and environmental protection; urban water cycle; flood frequencies, flood protection.

Unit 2: Water Supply System

Water supply distribution system, measurement of pressure and velocity, pressure requirement and number of storeys of buildings; water requirement for different land uses, fire fighting; Factors affecting water demand, per capita requirement, variation of water consumption, distribution and storage; Hardy Cross method; 'Loop' and 'Branch' computer simulation for water supply design.

Unit 3: Storm Water Management System

Estimating storm run-off, run-off co-efficient, rainfall intensity, time of concentration; gravity flow, hydraulic gradient line; Manning's formula and monographs, full flow and partial flow, layout and design of storm water system, hydraulic design of storm water system, computation procedure, rain water harvesting.

Unit 4: Sanitation and Sewer System

On-site detention, design procedure for on-site detention; low cost appropriate technologies for sanitation; sanitary sewer system, sewer network, materials used, sewer system location and layout, data needs and procedure of planning; quantity of sewage, standards for Indian cities, sewer appurtenances; sewer pumping and forced main manholes.

Unit 5: Solid Waste Management

Solid waste management for Indian cities, issues and data base, quantity of solid waste and its character, collection and transportation, disposal of solid waste, land filling and composting, pre and post treatment; Indore and Bangalore methods, incineration, pyrolysis and recycling park.

Suggested Readings:

1. Alan C Tort (2000), *Water Supply.* Science Direct, New York.
2. George T and Frank K. (2012), *Handbook of Solid Waste Management.* Access Engineering Library. New York.
3. May L (2001), *Stormwater Collection Systems Design Handbook.* McGrawhill, Delhi.
4. Ministry of Urban Development (2012), *Handbook of Service Leve Benchmarks.* Govt of India. Delhi.

MPEP201 Urban Environmental Planning Studio

Number of Credits	12	Subject Category	Studio
Lecture Periods/Week	0	Internal Assessment	200
Practicals /Lab/Workshop Periods/Week	12	External Jury	200
Total Periods/Week	12	Total Marks	400

Objective: To develop planning skills through hands-on exercises of planning and to develop environmental planning perspective within planning thoughts.

Introduction to Environmental Baseline Studies and Assessment

Detailed environmental studies to establish baseline of different components of environment at the town level, linkages, cause-effects and analysis of key environmental issues; Transformation of environmental conditions; Transformation of physical and socio-economic conditions; Relating physical growth and development aspects with changing environmental conditions.

Outline Development Planning with a focus on Environmental Management Plan at a Town/Sub-City level

Detailed assessment of environmental status (all components) through primary and secondary surveys, Identification of Sources, Levels of Issues and Problem Analysis. Students to be taken to a live case area/town to undertake the exercise culminating in the preparation of Environmental Improvement Plan / Conservation Plan / Environmental Regulations; Case studies/projects from coastline, ecologically sensitive areas, hill terrains, forest areas, deserts, delta regions etc. to be preferred.

Note:

1) Management and implementation of proposals are to be emphasised at every level of strategisation. To bring an holistic and pragmatic dimension to the Masters course, five core underlying parameters of a) Sustainability, b) Equity, c) Efficiency, d) Harmony, and e) Safety, are to be incorporated in the instruction strategies through case studies and examples, wherever applicable.

2) There need to be focus on identifying and analysing environmental concerns in the studio exercise.

Suggested Readings:

1. Government of India (2015), *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines*. Vol. 1, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi.
2. Honachefsky W B., (2000), *Ecologically Based Municipal Land Use Planning*. Lewis Publishers, London.
3. Ministry of Urban Development (2012), *Handbook of Service Leve Benchmarks.* Govt of India. Delhi.
4. Randolf, J. (2012), *Environmental Land Use Planning & Management.* Island Press, Washighton.

MPEP211 Elective 1: Ecological Footprint Analysis (Elective I)

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: Detailed understanding of Ecological footprint analysis as a contemporary tool related to carrying capacity.

Unit 1: Ecology and Planning

Definitions, types and principles of ecology and footprints, importance of urban and human ecology; Ecological theories and practices, principles and values towards planning and development

Unit 2: Carrying Capacity and Limits to Growth

Population ecology, carrying capacity and human population, understanding limits to growth; Consumption and its dimensions – food, energy, non-biodegradable items, travel, concept of ecological footprint – a land based understanding of carrying capacity.

Unit 3: Ecosystems and Footprints

Species evolution and interaction, implications of human intervention in ecological niche; biodiversity and its significance, valuation of biodiversity; Ecological impacts within evolving eco-systems; Delta and wetland ecosystems; arid and semi-arid ecosystems; Forest conservation in Asia and Africa.

Unit 4: Footprint vis-a-vis Bio-capacity of Region and Settlement

Land equivalent of consumption; Energy-Land relation to assess footprints; Cropland footprint, grazing footprint, forest footprint, fishing ground footprint; Urbanisation in the context of footprints; Biocapapcity calculations for a region and its resource base; Assumption factors in bio-capacity.

Unit 5: Methods and Applications

Consumption land use matrix method for footprint calculations of settlements; Calculating individual footprints; Regional analysis in footprints; National Aggregated footprints; Income – trade – footprint relations; Footprints analysis as tool for sustainability studies.

Suggested Readings:

1) Collins A. (2015), *The Ecological Footprint: New Developments in Policy and Practice.* Elgar Publishing. Cardiff.
2) Global Footprint Network (2012), *Living Planet Report 2012: Biodiversity, Biocapacity and Better choices.* WWF International Press. California.
3) Meadows D H, Randers J., Meadows D L. (2012), *The Limits to Growth. The 30 Year Update.* Chelsea Green Publishing, Vermont.
4) Wackernagel, M. and W. Rees. (1996), *Our Ecological Footprint: Reducing Human Impact on the Earth.* New Society Publishers.

MPEP212 Elective 2: Water and Wastewater Treatment (Elective II)

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To impart the students detailed understanding of Sources of water, forecasting of water & wastewater, water quality standards Advanced Water and Wastewater Treatment process.

Unit 1: Planning for Water Supply System

Public water supply system; Planning, objectives, design period, population forecasting; Water demand, sources of water and their characteristics, surface and groundwater, Development and selection of source, water quality, characterization, water quality standards.

Unit 2: Water Treatment

Objectives, unit operations and processes, principles and functions of flash mixers, flocculators, sedimentation tanks and sand filters, disinfection, residue management.

Unit 3: Advanced Water Treatment

Aerator, iron and manganese removal; Defluoridation and demineralization, Water softening, Desalination, membrane systems, construction and operation & maintenance aspects of water treatment plants, recent advances, membrane Processes.

Unit 4: Planning for Sewerage System

Sources of wastewater generation; Effects, estimation of sanitary sewage flow, estimation of storm runoff; Factors affecting characteristics and composition of sewage and their significance, effluent standards; Legislation requirements.

Unit 5: Wastewater Treatment

Objective; Unit operation and processes, selection of treatment processes, onsite sanitation, septic tank, grey water harvesting, primary treatment & secondary treatment, principles and functions; Recent advances in sewage treatment; Construction and operation & maintenance of sewage Treatment plants.

Suggested Readings:

1. Garg, S.K., (2005), *Environmental Engineering*. Vol.1 Khanna Publishers, New Delhi.
2. Modi, P.N., (2005), *Water Supply Engineering*. Vol. I Standard Book House, New Delhi.
3. Punmia, B.C., A K Jain and A K Jain,. (2005), *Water Supply Engineering*. Laxmi
4. Ramesh G and Nagavdevara V P (2010), *Urban Infrastructure and Governance.* Routlege India, Delhi. Publications (P) Ltd., New Delhi.

MPEP213 Elective 3: Planning for Healthy Cities (Elective III)

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To ensure the application of the concept of health promotion in urban settlements through urban planning tools and methods.

Unit 1: Basic Concepts and Terminology of Urban Health

Meaning of health, disability, wellbeing, and quality of life in the context of urbanization; Concepts of disease ecology, environmental and public health, health equity, diffusion of diseases in urban system.

Unit 2 : Conceptual and Theoretical Basis for Healthy Cities

Public health in new era; health, environment and sustainable development; WHO Healthy Cities - concept and principles of planning for healthy cities; Built environment as a determinant of health; Global climate change and health impacts on cities.

Unit 3 : Urban Planning to Improve Health and Well-being

Non-segregated land use allocation and its implication on health; Urban green areas and their role; Creating environmentally sound urban corridors; Implications of urban wastes and municipal health; health impact assessment of development projects.

Unit 4 : Integrated Health Based Planning

Morbidity and mortality indicators; Integration of health elements with land uses; steps to promote healthy cities: identification of major health issues and health inequities, explore proximate and distal causes.

Unit 5 : Urban HEART as Tool to Plan Intervention

Introduction to Urban Health Equity and Assessment and Response Tool (Urban HEART); Principles and pillars of Urban HEART; Social and economic determinants of health; social gradient in health; Tools and mapping of health inquities in urban areas.

Suggested Readings:

1. Barton H. (2005), *A Health Map For Urban Planners: Towards A Conceptual Model For Healthy Sustainable Settlements*. Built Environment, Vol. 31:339-355.
2. Barton H., Claire M. and Catherine T. (2009), *Healthy Urban Planning in European Cities*. Health Promotion International, Vol 24 (Suppl 1) : 91-99.
3. Barton H., Claire M. and Catherine T. (Eds.) (2003), *Healthy Urban Planning in Practice Experience of European Cities. Report of the WHO City Action Group on Healthy Urban Planning.* WHO Regional Office for Europe, Copenhagen.
4. WHO, Centre for Health Development (2008), *Our Cities, Our Health, Our Future*. Report to the WHO Commission on Social Determinants of Health. NY.

Third Semester

MPEP302 Advanced Research Methods

Number of Credits	3	Subject Category	Lab
Lecture Periods/Week	0	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	3	External Jury	50
Total Periods/Week	3	Total Marks	100

Objective: To initiate the planning thesis by enabling students to identify a topic and then develop a proposal and methodology in detail besides providing them with the required theoretical inputs on the syllabus contents.

Unit 1: Introducing Research

What is research? types of research, basics of academic and applied research; Different approaches to research; Research philosophies – positivist and phenomenological philosophies. Introduction to elements of research: epistemology, theoretical perspective, methods, methodology; Justification of choice and use of methods and methodology; Paradigms in research.

Unit 2: Developing Thesis

Research methodology: Quantitative – surveys, experimental, longitudinal, cross-sectional studies; Qualitative – case studies, action research, ethnography, participative enquiry, grounded theory. Content development - Developing contextual background; Research design; Identification of research problem; Research questions; Formulation of hypothesis; Writing aims, objectives, scope and limitations; Review of relevant literature; Identification of suitable research methods/ techniques/ instruments; Data collection – questionnaires, sampling techniques, observation, interviews; Analysis - qualitative and quantitative analysis, data synthesis; Research outcome – research findings.

Unit 3: Research Ethics

Prior permission and intimation, conduct of interview, asking right question, confidentiality, elimination of bias and suspicion; Roles and social responsibilities of the researcher; Time management in research

Unit 4: Field Work Plan

Survey format preparation, study area identification and map preparation; Work plan schedule.

Unit 5: Research Communication

Research vocabulary, Reading – notes taking, material organisation, indexing; Technical writing – content synthesising, paraphrasing, citation and referencing; Academic writing – research proposal / synopsis, abstract writing, report writing and mapping; Presentation: effective oral communication – content structuring, voice modulation, body language, audio-visual aids, handouts.

Suggested Readings:

1. Keith F. Punch (2013), *Introduction to Social Research: Qualitative and Quantitative Approache*s. Sage Publications, London
2. Crotty M. (2012), *Introduction: The Research Process, the Foundations of Social Research, Meaning and Perspective in the Research Process*. Sage Publications, New Delhi.
3. Frankfort, Nachmias, C., & Nachmias, D. (2008), *Research Methods in the Social Sciences*. New York: Worth
4. Neville, Colin (2007), *An Introduction to Research and Research Methods*. Effective Learning Services, School of Management, University of Bradford

MPEP303 Environmental Law and Professional Practice

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To highlight different environmental legislative contexts and its application in professional practice.

Unit 1: Environmental Law in India

Global legislative initiatives in environmentalism; legislations as a tool for environmental protection; the Environmental Protection Act of India; the National Green Tribunal and its significance; Forests Acts; Wildlife Act; Environment in 73/74 CAA; other Acts at national and regional level.

Unit 2: Environmental Policies

National Environmental Policy 2006, Coastal Regulations Zone Act, significance of National Biodiversity Boards and State Biodiversity Boards.

Unit 3: Terms of References in Environmental Projects

Terms of references (ToRs) – development, significance and adherence; detailed feasibility reports as per ToRs; compliance reports; inception reports; closure documents in context of ToRs; etc.

Unit 4: Professional Practice in Environmental Projects

Scale of professional fees and charges; preparation of consultancy proposals; Agreements and contracts; Organising and establishing office; Performance appraisal.

Unit 5: Public Participation in Environmental Assessment

Significance of public consent and public participation as per Environmental Protection Act; Formats and procedures for public hearing in environmental assessments; rapid appraisal of environmental baseline and impact through stakeholders' participation.

Suggested Readings:

1. Government of India (2006), *National Environment Policy 2006.* Ministry of Environment and Forests , New Delhi.
2. Glatthorn A. A, and Joyner R. L. (2005), *Writing the Winning Thesis*. Corwin Press, California
3. Kulshrestha S K (2012), *Urban and Regional Planning in India.* A Handbook for Professional Practise. Sage, Delhi.
4. Lesley Wing Jan (2009), *Write Ways: Modeling Writing Forms.* Oxford University Press, Oxford

MPEP304 Environmental Impact Assessment Techniques

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To understand the theoretical base for application of environmental impact assessment in development planning.

Unit 1: Role of EIA in the Planning and Decision Making Process

Need for EIA; approaches to EIA and its relation with planning practise; EIA: Origin and Development; EIA in Indian context; Legislative context of EIA in India.

Unit 2: Overview of Processes for Impact Studies

Conceptual Approach; Proposal, Study Formulation, Responsibilities assignment; Overview of key steps and procedures; Screening of Projects for EIA in Indian context; Process Flow of EIA; Guidelines and Terms of Reference for EIA.

Unit 3: EIA Methods

Categories of EIA Methodologies; Check List Methods - Quantitative Checklists, Multi Attribute checklists, Matrixes Methods - Leopold Matrix, Magnitude Matrix, Weighted Matrix; Network Methods – Causal Diagrams for Impact Predictions.

Unit 4: Impact Prediction and Mitigation Methods

Determination of Environmental Impact Importance and Determination of Weightages; Measurement of Impacts: Impact Prediction and Evaluation – CBA, Planning Balance Sheets; Impact Mitigation case studies and best practices; Comparison of Alternatives; Evaluating non-technical summaries; critical evaluation and appraisal of EIA reports; case sudies

Unit 5: Concept of Social Impact Assessments

Types of Socio-economic Impacts; Basic Steps in carrying out socio-economic impact assessment; Environmental Settings Description; Analysis of Public Services and Facilities; Impacts of Economic Profile of Community; Prediction and Changes in Socio-economic Factors; Case studies.

Note: Identifying and analysing environmental concerns in the concurrent studio exercise of may be taken up for detailing.

Suggested Readings:

1) Richard K. M. (2002), *Environmental impact assessment, a methodological perspective*. Kluver Academic Publishers, Boston.
2) Morris P. and Therivel R. (2010), *Methods of EIA – 3rd Edition.* Routledge, London.
3) Ministry of Environment and Forests (2010), Environment (Protection) Rules, 1986 – Amendment – National Environmental Policy"
4) Ministry of Environment and Forests (2012), *Terms Of Reference [ToR] For EIA Report.* Govt of India, Delhi.

MPEP305 Project Planning & Management

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: Understand the various aspects of project planning, management, implementation and appraisal.

Unit 1: Introduction to Project Planning

Introduction to Projects, Nature of planning projects, Project life cycle, Methodology for project identification and formulation; detailed project report, and feasibility studies, pay-back period, internal rate of return (IRR), DCF, net present value (NPV), cost benefit ratio (CBR), financial cost-benefit analysis, economic cost benefit analysis.

Unit 2: Project Formulation and Appraisal

Projects and planning issues including sectoral policy at local, State, and National levels project appraisal; Approaches of appraisal - World Bank and Asian Development Bank methods: technical, financial, social, economic, environmental, institutional approaches, SCBA, UNIDO approaches

Unit 3: Project Management

Project characteristics; techniques of management, Importance of project management; PERT & CPM; new techniques of management by objective (MBO).

Unit 4: Pre-implementation Planning Phase

Work break down structure; network analysis; CPM, PERT; resource levelling and allocation; time-cost trade off aspects.

Unit 5: Project Implementation, Monitoring and Evaluation

Project implementation, stages of implementation; actors in projects implementation; project monitoring; meaning objectives and significance; monitoring techniques; integrated reporting, milestones, time and cost over-run and under runs, unit index techniques; project evaluation; Techniques of project evaluation; Input analysis, financial cost-benefit analysis, social-cost benefit analysis; Case studies in urban and regional planning projects.

Suggested Readings:

1. Albert Lester (2007), *Project Management, Planning and Control*, Butterworth Heinemann publishing house, United Kingdom.
2. Harold R. Kerzner (2013), *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, John Wiley & Sons, New Delhi.
3. Jose Maria Delos Santos (2013), *Project Management Absolute Beginner's Guide – A Book Review*, QUE Publishing house, New Jersey.
4. Ramakrishna K (2010), *Essentials of Project Management,* PHI Publishing house, New Delhi.

MPEP306 Energy Studies

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: Introduce the fundamental concepts of quantification based assessment of energy consumption.

Unit 1: Principles of Energy: Sources and Consumption

Energy Demand and Supply; sources of energy and typology of energy available at source; Quantification of Resource Consumption and patterns of consumption; Relating energy consumption patterns with sectors – residential, commercial, transport, etc.

Unit 2: Cluster & Group Based Energy Use

Energy efficiency and ISO; Introduction to ISO; ISO-14000 and its Planning Implications; Case Study of an ISO certified industry, Environmental and Financial Benefits of ISO; Cluster Based Environment Management approach & Group Environmental Management System.

Unit 3: Monetary Valuation Techniques

Monetary valuation techniques – Cost Benefit Analysis, Natural Resource Accounting, Pricing, Non-use Value, Techniques of monetary evaluation/ valuation methodologies; Energy Audit; Conservation Issues.

Unit 4: CDM and Carbon Credit

Concepts of cleaner development mechanism; Life cycle analysis; Carbon trading / GHG emissions.

Unit 5: Energy Efficiency and Re-use

Energy vis-a-vis concept of smart cities; Solar city mission in India; Renewable energy concept and its application in planning; Green cities and its energy implication, energy footprint.

Suggested Readings:

1. Ercoskun O Y (2012): *Green and Ecological Technologies for Urban Planning: Creating Smart Cities.* IGI Global.
2. Khalil H and Khalil E. (2015): *Energy Efficiency in the Urban Environment.* Taylor & Francis, London.
3. Sheperd W and Shepard D (2014): *Energy Studies.* Imperial College Press, London.
4. UN Habitat & ICLEI (2009): *Sustainable Urban Energy Planning. A Handbook for Cities and Towns in Developing Countries.* UN Press, NY.

MPEP301 Regional Environmental Planning Studio

Number of Credits	12	Subject Category	Studio
Lecture Periods/Week	0	Internal Assessment	200
Practicals /Lab/Workshop Periods/Week	12	External Jury	200
Total Periods/Week	12	Total Marks	400

Objective: To be able to apply environmental planning techniques for detailed environmental impact assessment at a regional scale for large projects.

Natural Resource Baseline Studies and Regional Assessment

Detailed environmental studies to establish baseline of different components of environment at the regional level; Identification of key environmental issues at the regional level and their interrelations.

Detailed Environmental Assessment and development of a Integrated Environmental Management Plan at a District / Regional level

Detailed Assessment of Environmental Status (all components) through primary and secondary surveys, identification of sources, levels of issues and problem analysis. Students to be taken to live case area/ town to undertake the exercise culminating in the preparation of Integrated Environmental Management plan at a district / regional level OR development of conservation plan / environmental regulations at a district or regional level.

Note:
1) Management and implementation of proposals are to be emphasised at every level of strategisation. To bring an holistic and pragmatic dimension to the Masters course, five core underlying parameters of a) Sustainability, b) Equity, c) Efficiency, d) Harmony, and e) Safety, are to be incorporated in the instruction strategies through case studies and examples, wherever applicable.
2) Focus is to be on identifying and analysing environmental concerns in the studio exercise.

Suggested Readings:

1. Daniels T (2012): *Environmental Planning Handbook: For Sustainable Communities and Region.* APA Planners Press. NY.
2. Government of India (2015), *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines*. Vol. 1, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi.
3. Govt of India (2012): *Handbook of Service Leve Benchmarks.* Ministry of Urban Development. Delhi.
4. Padt (2007): *Green Planning: An Institutional Analysis of Regional Environmental Planning in the Netherlands.* Taylor & Francis, NY.

MPEP311 Human Settlements and Climate Change (Elective I)

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To Interrelate the human settlements in climate change perspective and understand strategies for adaptation and spatial planning tools for mitigation of GHG emissions.

Unit 1: Introduction to Climate Change

Concern, human settlements as a major source of emissions, vulnerability to impacts of climate change, emission paths, strategies, location of settlements, socio-economic characteristics, cultural practices and governance structure, suitable interventions

Unit 2: Climate Risk and Vulnerability in the City

Risk due to climate change, risk assessment, impacts due to flooding, cyclones and landslides, impacts on infrastructure, urban governance and participation

Unit 3: Urban GHG Emissions

Sectoral emission – residential, industrial, transport, waste disposal, reducing emissions and urban carbon footprints, carbon trading and other alternatives

Unit 4: Climate Change Mitigation and Low-Carbon Cities

Energy efficient approaches, Urban climate governance, transportation and energy systems for the future, land-use planning and compact cities, future and smart cities, reducing the urban heat islands, protecting urban water systems from climate change risks

Unit 5: Adaptation – Towards Climate Resilient Cities

Includes climate change adaptation – migration as adaptation, climate change experiments and alternatives, Climate change, Vulnerable Regions and Groups – Tropics, farmers, gender, children, poor and migrants

Suggested Readings:

1. Betsill M (2005): *Cities and Climate Change.* Routledge, London.
2. Harriet Bulkeley (2013): Cities and Climate Change. (Routledge Critical Introductions to Urbanism and the City), Routledge, New York.
3. Rosenzwieg C. (2011): *Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network.* Cambridge University Press, Cambridge.
4. Zimmermann O (2011): *Resilient Cities. Cities and Adaptation to Climate Change - Proceedings of the Global Forum 2010.* Springer.

MPEP312 Waste Management (Elective II)

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To understand wastes as a by-product of urbanisation, with particular emphasis of hazardous wastes, its treatment and legislative implications.

Unit 1: Wastes, Hazardous Wastes and its Types

Typology of wastes – municipal wastes, domestic wastes, industrial wastes, bio-medical wastes – dry and wet wastes, organic and inorganic wastes; charectericitcs of wastes; generation of wastes - sources and composition, standards and rates off generation; collection, transportation and disposal of wastes; municipal waste management rules.

Unit 2: Industrial Waste and Related Legislative Frameworks

Industrial wastes as sources of pollution for water, air and soil; legislations related to industrial pollution; categorisation of industries as per pollution; industrial consumption of energy and its relation to waste generation; disposal standards in industries; legisative procedures of waste management in industries, industrial estates and corridors.

Unit 3: Bio-Medical Wastes and related Legislative Frameworks

Categorisation of bio-medical wastes, process of transport, treatment and disposal of medical wastes, generation standards as per beds; Existing rules related to disposal of bio-medical wastes.

Unit 4: Waste Disposal Techniques

Different methods of waste treatment and disposal – comparative analysis; Requirements of land, expertise, energy and costs related to different methods.

Unit 5: Waste as a Threat and a Resource: Case Studies of Waste Management Plans

City sanitation plans in India; Service level benchmarks in waste management; Waste to energy as a concept – advantages and disadvantages; earning from wastes; Governance models in waste management.

Suggesetd Readings:

1. Bhatt M S. and Illiyan A. (2012). *Solid Waste Management: An Indian Perspective.* Synergy Books India. Delhi
2. Kreith F. and George T. (2002). Handbook of Solid Waste Management. McGrawHill Publishers. New York.
3. Micheal D L. Philip B. (2010) Hazardous Waste Management. Waveland Press. London.
4. Vaughn J. (2009). *Waste Management: A Reference Handbook. Contemporary World Issues.* ABC Press, New York.

Fourth Semester

MPEP402 Environmental Justice

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To make the students aware of the different aspects of the environmental problems and their relationship to culture and to raise important issues related to ethics, justice and politics in environmentalism.

Unit 1: Culture and Environment

Cultural landscapes; ideas of Carl Sauer, elements of cultural landscape; people, nature, values, places; World Heritage cultural landscapes – clearly defined, organically evolved and associative cultural landscapes; cultural values and urban planning.

Unit 2: Ethics and Environmentalism

Dispersal of causes and effects of the current environmental problems; issues of spatial equity - differential consumption patterns around the globe; inter-generational equity; ethical questions in the environmental debate and the idea of the moral storm; environmental movements in India – networks; organised action, civil societies and citizens as environmental actors.

Unit 3: Climate Justice

The idea of climate justice; environmental rights, positive and negative rights; survival and luxury emission rights, international law and climate justice; the role of international organisations in ensuring climate justice.

Unit 4: Society and Nature: Social Construction of Global Climate Change

Ecosystem services; social systems in relation to environmental systems; environmental determinism and cultural determinism; capitalism, consumerism and society and its impacts on the environment; Urban sprawl and climate change; international case studies on social and environmental systems.

Unit 5: Towards Environmental Solutions

Ecological responsibility; Adaptation, new technologies with examples; Smart urban systems.

Suggested Readings:

1. Steve Vanderheiden (2008) *Political Theory and Global Climate Change*, MIT Press, Massachusetts
2. Konstantinos T, Kalevi K, Stephen V, Vesa Yli-Pelkonenc, Aleksandra Kazmierczak, Jari Niemelac, Philip James (2007), "Promoting Ecosystem and Human Health in Urban Areas using Green Infrastructure: A literature Review", *Landscape and Urban Planning*, 81 (2007) 167–178
3. Brian Roberts, Peter Atkins, Ian Simmons (2014) *People, Land and Time: an Historical Introduction to the Relations between Landscape, Culture and Environment*, Routledge, New York.
4. Sandler R (2007): *Environmental Justice and Environmentalism: The Social Justice Challenge to the Environmental Movement.* MIT Press, Masachuttes.

MPEP403 Environmental Policy and Governance

Number of Credits	3	Subject Category	Theory
Lecture Periods/Week	3	Internal Assessment	50
Practicals /Lab/Workshop Periods/Week	0	End Evaluation	50
Total Periods/Week	3	Total Marks	100

Objective: To develop knowledge of key policies, legislations and regulations related to Environment in India by discussing 1- constitutional mandates, 2- bare acts, 3- institutional reformation brought about, 4- role of judiciary and 5- role of civil society

Unit 1: From Government to Governance and Global Governance

The doctrine of separation of powers; judiciary, legislature and executive – rule of law – significance of law and its relationship to urban planning; Indian Constitution, provisions regarding property rights; Right to property versus power of eminent domain; concept of governance and good governance; International actors, conventions and protocols.

Unit 2: Natural resources and its Governance in India

EP Act 1986; Forests since post-independence period – in the policy and the five year plans- Forest Conservation Act (1980); Need and utility of a forest rights act in India - Forest Rights Act (2006); Air (Prevention and Control of pollution) Act; Water (Prevention and Control of pollution) Act; The Indian wildlife Protection Act, 1972; Mines and minerals Act 1952 and 2011; Factories Act; Pesticides Act.

Unit 3: Built Environment and Nature

Ancient Monuments and Archaeological Sites and Remains Act; Hazardous Waste Management and Handling Rules / Biomedical Rules / Solid Waste Management Rules.

Unit 4: Disaster Management and Climate Change

Natural and manmade disasters and the role of state apparatus, judiciary, civil society and media is developing resilience; Climate change Protocols and Conventions; National action plan for climate change (MoEF) and other related initiatives.

Unit 5: Environmental Jurisprudence in India

Human rights and the environment; role and significance of MOEF; Appellate Authority Act; National green tribunal; other related Notifications.

Suggested Readings:

1. Banerjee,D. (2008). Environmental Jurisprudence in India: a look at the Initiatives of the Supreme Court of India and their Success at Meeting the Needs of Enviro- Social justice. International Congress of Environmental Research, December 2008.
2. Damodaran A. (2012), 'The Challenge of Multi Level Environmental Governance In India', Periodica Oeconomica, Pp. 29–37.
3. Raghav Sharma, 'Green Courts in India: Strengthening Environmental Governance?' 4/1 Law, Environment and Development Journal (2008), p. 50, available at http://www.lead-journal.org/content/08050.pdf.
4. Verghese, B.G.(2013).Environmental Governance in India: The Challenge of Multiple Transitions. Commonwealth Governance Handbook 2013/14, pg. 120-122.

MPEP401 Environmental Planning Thesis

Number of Credits	24	Subject Category	Thesis
Lecture Periods/Week	0	Internal Assessment	400
Practicals /Lab/Workshop Periods/Week	24	External Jury	400
Total Periods/Week	24	Total Marks	800

Objective: To conduct independent scientific research in the form of a terminal project on a topic decided in the last semester.

Each student of the M. Planning (Environmental Planning and Management) course is required to undertake a terminal project on a subject related environmental planning concern with respect to urban, rural, or regional development as approved by the Department in the third semester in the course Advanced Research Methods (MPEP 302).

The terminal project will provide an opportunity to the student to synthesise the knowledge and skills acquired through the learning of various theories and practices during the course and apply it for strategy formulation for a live planning challenge.

The terminal project shall be monitored continuously and periodically through internal marked reviews to check the consistency of work, the relevance of the analysis with respect to the data collected and project scope, and the progress towards logical proposals. The final output shall be firstly in the form of an extended abstract, which once approved by the department will be followed by the submission of a detailed report and drawing/visuals for external jury members, in a given format. The terminal project shall also be presented orally in external jury by each student in the form of visuals / drawings as necessary for each topic.

Suggested Readings:

1. Elizabeth A. Wentz (2013), *How to Design, Write, and Present a Successful Dissertation Proposal*, Sage Publications.
2. John Biggam (2015), *Succeeding with Your Master's Dissertation: A Step-By-Step Handbook*, Open University Press, McGraw Hill Education, UK.
3. Murray, Rowena (2011), *How To Write A Thesis*, Open University Press, McGraw Hill Education, UK.
4. Tayie, Sami (2005), *Research Methods and Writing Research Proposals,* Pathways to Higher Education, Cairo.