

PROPOSED SCHEME AND SYLLABUS
OF
POSTGRADUATE PROGRAMME

MASTER OF PLANNING
(ENVIRONMENTAL PLANNING)



Department of Planning
School of Planning and Architecture, Bhopal

June 2013

Master of Planning (Environmental Planning)

Introduction

The threat to environment is one of the foremost global concerns of our times. The pace of growth witnessed in the past few decades has caused a collateral damage to our environment. Ultimately, the survival of not only human beings but that of the other living species would depend on having a hospitable environment. The situation is getting worse day-by-day and governments across the globe are engaged in addressing issues which have a bearing on our environment. Environmental problems are persisting because of poor planning and management of environment. It is to be noted that in our bid to provide better quality of life to human race, we have recklessly exploited natural resources. The damage to environment is being seen in the form of problems like: global warming, climate change, depletion in water table, emergence of drug resistant pathogens, etc. Primarily, increasing urbanization and industrialization are the main causes of environmental degradation. Developmental activities for human race cannot be decoupled from the need for better environmental planning. Therefore, development without threatening the environment is the global agenda these days. This approach requires well qualified professionals who can plan and manage not only upcoming development projects in an environment friendly way but can also shape existing built environment for better quality of life.

The proposed programme focuses on the interrelationship between the ecological, social and economic aspects of environment to ensure environmental conservation. Emphasis will be on how to achieve better environment conservation through detailed planning and professional management. Environment, being a multidisciplinary subject, draws upon the physical, social, biological, cultural, economic and legal issues. In this programme, students will learn; how all these issues interact and problems can arise because of differing perspectives, needs and biophysical limitations. This understanding of various facets of environment will help in developing analytical skills needed for performing the assigned task related to planning of environment. The course contents of this programme would enable the students to understand the practicality and congeniality of living environment and current environmental concerns. Emphasis will be on acquiring practical skills for spatial planning through studio and lab exercises.

Admission Eligibility

Minimum educational Qualification with 55% marks in aggregate on any one of the following disciplines needs to be fulfilled for admission into the Master of Planning (Environmental Planning) Programme:

B. Arch/B. Plan
B.E./B. Tech in Civil Engineering
M.Sc. / M.A. in Geography/ Economics / Sociology

Students shortlisted on the basis of above mentioned eligibility criteria are required to appear in an interview conducted by School of Planning and Architecture, Bhopal along with three letters of recommendations.

Course Structure

The course is divided into four semesters. The first semester is common for all Master of Planning specializations, where the students will be taught basic foundation subjects to enhance their understanding of planning and to strengthen their analytical skills. In addition, students will also be introduced to theory of environmental planning, its components and available tools & techniques.







Second and Third semesters will deal with core subjects of Environmental Planning. The main focus will be on providing intensive theoretical knowledge of core environmental planning subjects like environment and society, economics, monitoring, impact assessment, waste management, climate change, resource management, disaster management and various management systems. The thrust of the studio problem would be for designing and planning urban as well as regional areas along with understanding the various facets of impact assessment through live study, understanding measurement of various pollution levels through lab exercises, thereby focusing on applying all the theoretical learning's in these two semesters. A thesis programming subject in third semester will orient students towards finalizing their research work of final semester. Two specialized electives related to environmental planning and one common elective are included in third and fourth semester. The subjects listed under 'Common Pool Elective' in this syllabus are those that the Environmental Planning programme would contribute to the pool. Students would however have a wider choice of electives not limited to those listed in this scheme.

Students will take up an environmental planning topic for their thesis work in final semester. The final Semester also has a subject of General Proficiency which tries to evaluate the student's involvement in activities beyond the core curriculum. At the Post Graduate level of education, learning is not restricted to the academic curriculum alone. The students will have to move beyond academics and actively engage themselves into various other activities so that they evolve as mature and confident professionals.

Summary of Course Structure

First Semester	Second Semester	Third Semester	Fourth Semester
Integrated Studio	EP Studio- I	EP Studio - II	Thesis
Planning History and Theory	Environmental Impact Assessment	Common Pool Elective	Elective - II
Housing and Environment	Environmental Policies & Legislation	Elective - I	Seminar
Economics and Urban Sociology	Environmental Economics and Finance	Project Appraisal and Environmental Management	General Proficiency
Infrastructure Planning	Disaster Mitigation and Environmental Management	Climate Change and Human Settlement	
Demography and Quantitative Methods	Environmental Monitoring and Assessment Lab	Waste Management	
Planning Techniques	Geoinformatics Lab for Environmental Planning	Thesis Programming	
		Professional Training (Summer)	

Legend

 Studio	 Theory	 Thesis
 Techniques	 Electives	 Comprehensive

Assessment

The objective of the evaluation system is to critically assess the thorough understanding of the discipline developed by the student and find appropriate means of assessing the knowledge and skills developed by each individual student.

All Studio subjects would be assessed through continuous evaluation in every class, with weightage being given to class participation. Intermediate reviews would be conducted at various stages of work with deliverables in the form of maps and reports predefined as part of the studio brief distributed in the beginning of the semester.

All Theory subjects would be assessed through written exams and assignments. The system of two stages of theory examinations would be taken for assessment of theoretical knowledge. Understanding of current issues related to course would be assessed through assignments to be submitted as reports and discussed through in class presentations. Case studies would also be given as assignments to understand the methodology and process adopted to carry out projects. In addition to assignments, participation of students in class discussion would be recorded and evaluated time to time.

End Semester Evaluation is based on theory examinations, Viva-voce examinations or a combination of both depending on the requirement of the subject and specified in the scheme

Evaluation Pattern

The performance of the student shall be evaluated through continuous assessment and it shall be based on minor examinations, class tests, intermediate reviews, assignments/ tutorials, quizzes/ viva voce, studio works, field works, home works, jury etc. and attendance.

- The end semester examination shall be conducted by means of written papers, practicals, jury and/or viva voce, design reports or a combination of these methods, as specified in the scheme of examination.
- For each subject the distribution of marks for assessment at different stages will be:

Stage 1 (5 weeks from the commencement of classes)	Stage 2 (10 weeks from the commencement of classes)	Attendance	Internal Assessment	End Semester Examination
15%	15%	5%	25%	40%

Note:

- 1) In the subjects having written exam & viva- voce in the end semester exam percentage will be considered as 20% for written exam & 20% for viva-voce exam.
- 2) The stages of marking adopted above will not be applicable for the subjects of professional training, and only one time evaluation at the end of the training period will be done. 40% of subject marks will be awarded by the employer in accordance to the institute format and 60% by the institute.

- All subjects carry number of credits as indicated in the scheme.
- To earn the credits a student has to obtain a minimum of 45% marks in that respective subject.
- It is compulsory for a candidate to appear in the end term examination.

Scheme for Postgraduate Programme
Master of Planning (Environmental Planning)

First Year : First Semester (Integrated Semester)					
Subject Code	Subject	WCH	ESE Format		Credits
MPLN0101	Integrated Planning Studio	12		VV	12
MPLN0102	Planning History and Theory	3	WR		3
MPLN0103	Housing and Environment	3	WR		3
MPLN0104	Economics and Urban Sociology	3	WR		3
MPLN0105	Demography and Quantitative Methods	3	WR		3
MPLN0106	Infrastructure Planning	3	WR		3
MPLN0107	Planning Techniques	3	WR	VV	3
	Total	30			30

WCH: WEEKLY CONTACT HOURS ESE: END SEMESTER EXAMINATION VV: VIVA-VOCE WR: WRITTEN EXAM

First Year : Second Semester					
Subject Code	Subject	WCH	ESE Format		Credits
MPEP0201	Environmental Planning Studio - I (Regional Issues)	12		VV	12
MPEP0202	Environmental Impact Assessment	4	WR		4
MPEP0203	Environmental Policies and Legislation	3	WR		3
MPEP0204	Environmental Economics and Finance	3	WR		3
MPEP0205	Disaster Mitigation and Environmental Management	2	WR		2
MPEP0206	Environmental Monitoring and Assessment Lab	3	WR		3
MPEP0207	Geoinformatics Lab for Environmental Planning	3	WR	VV	3
	Total	30			30

WCH: WEEKLY CONTACT HOURS ESE: END SEMESTER EXAMINATION VV: VIVA-VOCE WR: WRITTEN EXAM

Second Year : Third Semester				
Subject Code	Subject	WCH	ESE Format	Credits
MPEP0301	Environmental Planning Studio - II (Sectoral Issues)	12	VV	12
MPEP0302	Common Pool Elective	3	WR	3
A.	Energy Accounting and Auditing			
B.	Water Resource Management			
MPEP0303	Elective - I	3	WR	3
A.	Green Infrastructure			
B.	Bio-diversity and Eco-tourism			
	C.	Natural Resource Management		
MPEP0304	Project Appraisal and Environmental Management	3	WR	3
MPEP0305	Climate Change and Human Settlements	3	WR	3
MPEP0306	Waste Management	2	WR	2
MPEP0307	Thesis Programming	2	VV	2
MPEP0308	Professional Training (Summer)	2	VV	2
	Total	30		30

WCH: WEEKLY CONTACT HOURS ESE: END SEMESTER EXAMINATION VV: VIVA-VOCE WR: WRITTEN EXAM

Second Year : Fourth Semester				
Subject Code	Subject	WCH	ESE Format	Credits
MPEP0401	Thesis	22	VV	22
MPEP0402	Elective - II	3	WR	3
A.	Urban Forestry and Landscape			
B.	Poverty and Environment			
	C.	Environment and Society		
MPEP0403	Seminar on Contemporary Environmental Issues	4	VV	4
MPEP0404	General Proficiency	1	VV	1
	Total	30		30

WCH: WEEKLY CONTACT HOURS ESE: END SEMESTER EXAMINATION VV: VIVA-VOCE WR: WRITTEN EXAM

FIRST YEAR: FIRST SEMESTER

MPLN0101: Integrated Planning Studio

Course Objective:

The Integrated studio is the introductory studio common to all specializations of Master of Planning. It aims to bring students of diverse backgrounds to a common platform and develop the essential skills of planning amongst the students opting for different specializations of planning.

The objective of the studio is to introduce the general concepts associated with physical planning and develop the skills of documentation, data analysis, spatial representation and written and verbal communication. Application of the theoretical inputs provided in other subjects in the semester is also a key focus. Technical report writing, data analysis techniques and verbal and visual presentation techniques would be focused on in all the assignments.

Course Contents:

The thrust of the studio would broadly address the concepts of both urban and rural planning and integration of the city and region.

The studio would consist of three assignments:

- *Assignment 1: Understanding Human Settlement Systems*

The assignment would be a short introductory exercise undertaken with the objective of initiating students with the concepts of urban and regional planning by developing skills of observation and documenting the same in graphical ways.

The thrust of the studio would be on:

- Understanding the context of the city in its regional setting
- Readings on the city and settlement systems
- Understanding the structure of networks and land uses
- City form and its visual impact.
- Identification of landmarks and public realms.
- Application of appropriate techniques of documentation and presentation of the data collected.

- *Assignment 2: Area Planning in Urban Areas:*

The assignment would identify different urban zones based on land use characteristics and could also include predefined 'zones' for zonal plans. The objective of this exercise would be to learn various methods of surveying to collect different types of data and represent and interpret them to give meaningful observations on the planning and development of the area.

Thrust of the exercise would be on:

- Understanding the zone in the context of the city.
- Mapping of Regional Networks and Linkages
- Preparation of Base Map of the area through primary surveys and updating secondary data
- Socio-economic profiling of the area through surveys
- Physical and Social infrastructure mapping
- Gap Analysis and issue identification
- Formulation of broad outlines of Intervention Strategies and Development Blueprint.

- *Assignment 3: Rural Planning*

The main goal of the assignment is to expose students to the life and living in rural area as it is different from urban areas. This would help in conceptualising the integration of urban and rural areas for regional planning.

Students will undertake study of a particular village in groups and conduct a primary survey on demographic profile, household income level, socio-cultural practices, etc. Information about development programmes shall be collected and resource mapping will be done. This exercise will aim at improving the understanding about the requirements of different categories of rural population. Conducting the primary survey will provide exposure to research methodology, techniques of data collection, data processing and analysis.

Thrust of the exercise would be on:

- Understanding the socio-economic aspects of the rural settlement
- Importance of location, spatial and economic linkages of the village.
- Explaining the social and physical infrastructure of the village.
- Understanding the availability and usage of local resources.
- Exposure to government programmes and institutional mechanism working for rural planning and development
- Identifying the present problems and future possibilities in the village.
- Proposing a strategy of improvement in the condition and development of the villages.

MPLN0102: Planning History and Theory

Course Objective:

The objective of this course is to initiate the student to the historic growth and development of settlements across civilizations and the evolution of civic planning as a discipline through theories and concepts of modern planning thought.

The course shall be delivered through theoretical inputs and seminar presentations by students on selected topics.

Course Contents:

The course would include the following broad areas of planning knowledge:

- Relevance of the Subject: Settlement Formation and Growth as a Response to Social, Economic, Religious, Political and Cultural Needs. Need for Civic Planning
- The City in History: Settlements in Different Civilizations. Overview of City Planning in Mesopotamian, Egyptian, Greek and Roman Civilizations. Renaissance and Its Impact on City Form and Structure.
- Town Planning Thought and Principles in Ancient and Medieval India
- Industrial Revolution: Post Industrial Revolution Settlement Planning: Impact of Industrial Revolution on City Form, Population Density and Infrastructure Breakdown. Birth of Civic City Planning
- Classical Concepts of City Form- Concepts of Garden City, City Beautiful, Linear City and others. Contribution to Modern City Planning by Lewis Mumford, Patrick Geddes, Peter Hall, Jane Jacobs, Chadwick and others
- Theories of Urban Structure and Land Use- Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory, Land Use and Land Value Theory etc.
- Theories of Settlement Systems in Regional Context -Spatial Models of Location, Size and Spacing of Settlements; Rank Size Rule; Central Place Theory; Loschian Theory; Cumulative Causation Theory; Core Periphery Model; Growth Poles and Centres; Gravity Model; Classification of Settlements
- Models of Planning: Pluralism in Planning; Systems. Approach to Planning: Rationalistic and Incremental Approaches, Mixed Scanning, Advocacy Planning and Action Planning, Equity Planning
- Types of Plans: Master Plan, Development Plan, Structure Plan, Strategic Plan, Sectoral Plan, Zonal Plan, Local Area Plan, Action Area Plan Etc.
- City-Region Relationship: Structure of City Regions, Area of Influence, Dominance; Rural-Urban Fringes; Metropolitan Region; Socio-Economic Impacts of Growth of Urban Areas; Push and Pull Factors; Rural-Urban Migration; Location of New Regional Economic Activities; Impact of Technology on Urban Forms; Transportation and Urban Form; Other Emerging Issues in Planning

Suggested Readings:

1. Planning Theory, Healey P., Pergamon Press
2. Planning Theory, Allmendinger Philip, Palgrave MacMillan
3. Cities of the World: World Regional Urban development, Brunn S.D.et all.

4. City Assembled: The Elements of Urban form through History, Kostof Spiro, Thames and Hudson
5. Contemporary Urban Planning, Levy John M, Longman
6. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century, Hall Peter
7. Urban and Regional Planning Since Independence : Retrospect and Prospect : Technical papers, National Town and Country Planners Congress, Mysore, Ministry of Urban Affairs and Employment
8. Urban Planning : Theory and Practice, Rao M.P., CBS Publishers
9. The Oxford Handbook of Urban Planning, Weber Rachel et all, Oxford University Press
10. Urban Pattern: City Planning and Design, Gallion, Arthur B. and Eisner Simon, CBS Publishers

MPLN0103: Housing and Environment

Course Objective:

The course would have two sections on housing and environment and introduce the basics of both in relation to each other.

Housing:

The objective of this course is to familiarize students with a wide spectrum of aspects related to housing viz., housing scenario, housing needs, housing design, building legislations and relevant methods for formulating housing strategies. The course is introductory in nature, aimed at providing basic knowledge of issues of urban development relevant to housing planning in India.

Environment:

The objective of this course is to initiate the students to a discreet understanding of the environment and the interactions and inter-relationships of all living organisms with the physical surroundings. All social, cultural and technological activities being carried by human beings have profound influence on the environment. This course will enable a thorough understanding of all these aspects.

Course Contents:

Housing:

- Introduction to Housing- Housing and Urbanization; Significance of Housing in National Development Goals; Current Issues in Housing; Health and Safety Related Issues in Housing, Shift of Housing from Social Sector to Private Sector Participation
- Housing Design - Housing Typology, Housing Layouts, Housing Density, Community Facilities, Public and Private Sector Housing Development, Social Aspects of Housing, Built Environment and Human Behavior, Housing Norms and Standards
- Housing for the Poor- Issues in Slums and Squatter Settlements; Government Initiatives for Providing Housing
- Housing Demand- Housing Need Assessment, Estimating and Forecasting Housing Requirements (Qualitatively and Quantitatively); Understanding Current Methods of Housing Demand Assessment
- Affordable Housing- Household Affordability, Concept of Affordable Housing, Affordable Housing in India, Affordable Housing Policy 2009, Affordable Housing in Public Private Participation, Emerging thoughts
- Housing Policy- Understanding Five Year Plans, National Housing Policy- Review, Policy Framework for Urban and Rural Housing, Comparative Policy Analysis
- Rental Housing in India: An Overview, Current Practices and Upcoming Initiatives.
- Poverty and Informal Sector: Poverty and Poor Settlements – Definition, Dimensions, Deprivation, Measurement, Defining Parameters, Absolute and Relative Poverty; Magnitude of Problem; Concern for Poverty; Spontaneous Growth of Settlements; Perspective of Slums and Squatters; Functions in Urban Context; Squatter Formations by Illegal Occupation; Migratory Impulses and their Association with Growth of Informal Sector; Socio-Economic Deprivation and Environmental Degradation; Development of Informal Sector; Role of Informal Sector in Housing Stock, Economy, Commercial Activities, Etc.; Implications in Physical Planning

- Informal Sector Housing and Basic Needs - Lack of Essential Infrastructure; Poor Condition of Existing Services; Identification of Basic Needs; Provision for Various Target Groups; Standards for Basic Needs; Investment for Housing; Essential Components; Ownership and Tenure Security; Service Delivery - Gaps in Existing Institutional Systems of Delivery

Environment

- Man and Environment - Changing Perspectives in Man-Environment Relationship with Focus on Issues of Population, Urbanization, Resource Depletion and Pollution
- Concept of Ecology; Fundamentals of Ecosystem—Its Structure and Function
- Environmental Degradation (Environmental Concerns and Challenges) and Its Impact on Various Ecosystems
- Planning for Environmentally Sensitive Zones (Resources Availability, Settlements Pattern, Problems and Potentials, Regulating Mechanisms for Development)
- Tools and Techniques for Environmental Planning and Management- Introduction to Environmental Impact Assessment, Strategic Environment Assessment and Environmental Management Plans
- Environmental Policies and Initiatives Including Policies, Strategies, Protocols, Treaties
- Sustainable Development (Concept and Methods)

Suggested Readings:

Housing:

1. Housing: Changing Needs and New Directions, V. Gandotra, M. Shukul, N. Jaju and N. Jaiswal, Authors press
2. Housing and Urbanisation- A study of India, Cedric Pugh, Sage Publications, New Delhi
3. Housing Laws in India- Problems and Remedies, P.K.Sarkar , Eastern Law House Private Ltd.
4. National Housing Policy, GOI, New delhi
5. Reading Material on Housing, K. Thomas Poulouse, ITPI, India
6. Understanding Housing Policy, Brain Lund, The Policy Press, Great Britain
7. Urban Development and Housing in India- 1947 to 2007, Rishi Muni Dwivedi, New Century Publications
8. Housing Policies and Related Acts and Schemes of Government of India
9. Holding Their Ground: Secure Land Tenure for the Urban Poor in Developing Countries, Durand-Lasserve, Royston L, Earthscan Publication, UK
10. Plotting, Squatting, Public Purpose and Politics, Land Market Development, Low Income Housing and Public Intervention in India, Baken, Robert Jan, King's SOAS Studies in Development Geography
11. Shadow Cities: A Billion Squatters, a New Urban World, Neuwirth, Robert Taylor & Francis Group
12. The Urban Housing Manual: Making Regulatory Frameworks Work for the Poor, Payne, Geoffrey and Majale, Michael, Earthscan Publication, UK

Environment:

1. Fundamentals of Ecology, Odum, E.P., Barrett, G.W., Brewer, R., Thomson Brooks,
2. Ecoscience: Population, Resources, Environment, Paul R. Ehrlich et al.
3. Ecology, Impact Assessment and Environmental Planning, Westman W., John Wiley and Sons
4. The ecology of urban habitats, O. L. Gilbert, Chapman & Hall
5. Integrated Environmental Planning, James K. Lein, Blackwell Publishing
6. Cities and Natural Process: A Basis for Sustainability, Michael Hough
7. AITP Reader on Ecology & Resource Development, AITP
8. AITP Reading Material on Environmental Planning and Design, Prof A. K. Maitra , SPA Delhi
9. Ecology and Equity - The Use and Abuse of Nature in Contemporary India, Gadgil, M. and Guha, R., Penguin
10. Environment Crisis and Sustainable Development, Bahuguna, S., Natraj, Dehradun,

11. Environmental Issues and Researches in India, Agarwal, S.K. and Garg, R.K (eds), Himanshu Publications
12. Environmental Law and Policy in India - Cases Materials and Statutes, Divan, S. and Rosencranz A., Oxford
13. Environmental Problems in Third World Cities, Hardoy, J.E., Mitlin, D., and Satterthwaite, D., Earthscan

MPLN0104: Economics and Urban Sociology

Course Objective:

The course consists of two parts of Economics and Urban sociology, as essential inputs to the Planning profession.

Economics:

The objective of the course in Economics is to apprise students of the theoretical underpinnings in economics so as to enable them comprehend urban problems from the point of view of economic reasoning. The course is of an introductory level enabling students to acquire a fair amount of economic reasoning to analyse urban issues and would focus primarily on applications in the planning profession.

Urban Sociology:

The primary objective of the course in Urban Sociology is to train the students in the sociological study of life and human interaction. The course is so designed as to enable the students follow the sociological interpretations of the structures, processes, changes and problems of an urban area and by doing so providing inputs for planning and policy making. Thus the overarching objective of the course shall be to educate students about the nature and changing character of the city and the urban experience - including the larger social, political, and economic dynamics of urban change - so as to provide a more nuanced appreciation of the contemporary, comparative, and historical context in which urban planning skills and sensibilities have been developed and could be applied.

Course Contents:

Economics:

The following contents included in the course would be delivered with focus on linking the theoretical aspects with applications in planning, and the problems and assignments would focus specifically on these.

- Twin Themes of Economics – Scarcity and Efficiency; Market, Functions and Equilibrium; Micro v/s Macro Economics, Positive v/s Normative Economics
- Laws of Demand and Supply; Market Demand and Supply; Equilibrium in the Market
- Elasticity of Demand and Supply; Price, Income and Cross Elasticity
- Average, Marginal and Total Costs and Revenue; Derivation of Revenue and Cost Curves; Producers Surplus and Consumer Surplus
- Market and Types of Market, Product Pricing (Average Cost and Marginal Costs Principle); Factor Pricing (Marginal Productivity Theory)
- Resource Categories; Land and Returns to Land, Taxing Land and Rents; Environmental Externalities; Market Inefficiency with Externalities; Corrective Policies; Climate Change
- Measurement of Economic Activities, Basic Economic Growth Models (concept only), Human Development Index
- (Tools of economics, namely, input – output technique, game theory and linear programming shall be introduced to the students conceptually)

Urban Sociology

- Industrial Revolution and the Birth of Urban Sociology; Economic, Social and Cultural Processes of Urbanization and its Effects on Social Alienation, Class Formation and the Production or Destruction of Collective and Individual Identities; Theories of Karl Marx, Émile Durkheim, Max Weber and Georg Simmel
- Human ecology, Urbanism and Urban Sociology; The Chicago School; Elitism and Power of Place

- Indological (Ghurye); Structural-Functional (M. N. Srinivas); Dialectical (D. P. Mukherji, A. R. Desai); Subaltern (R. Guha); Non Brahmin (Phule, Dr. Babasaheb Ambedkar); Feminist (Neera Desai, Leela Dube)
- Urban Enclaves and Ghettos; Fear and Disorder; Gentrification; Integration and Segregation; Race and Ethnicity; Sociology of Gender; Urban Crime; Poverty and Homelessness; Immigration and Migration; Sociological Impact of Globalisation
- Inclusive Cities- Overview - Definition, Concepts, Elements of Inclusivity; Exclusion and Related Issues, Disparities, Social Fragmentation, Existing Divisiveness; Need for Inclusion of the Disadvantaged, Marginalized and other Weak and Vulnerable Social Groups
- Disparities and Equal Opportunities: *Disparities* – Gender, Race, Religion, Social Disparities; *Gender* – Gender Discrimination; Feminist Planning Theory; *Caste and Religion* – Characteristics, Disadvantaged Castes and Ethnic Minorities; *Special Needs* – Lack of Supportive Assistance, Issues; Assessing Specific and Special Needs; Planning and Designing for the Differently Aabled, Elderly, Children, and Pregnant Women; Planning Rights and Responsibilities; Provision of Equal Opportunities; Social Sustenance; Exploring Emerging Relevant Concepts and Monitoring Systems

Suggested Readings:

Economics:

1. Economics, Paul A. Samuelson et al, Tata Mc Graw Hill Publication
2. Micro Economics, Dominick Salvatore, Schaum's Outline Series, Mc Graw Hill
3. Micro Economics, N.C. Ray, Macmillan
4. Micro Economics, Anindya Sen, Oxford University Press
5. Economics, Alec Chrystal et al, Oxford University Press
6. Economics – An Analytical Introduction, Amos Witztum, Oxford University Press
7. General Economics, Deepashree, Tata Mc Graw Hill Publication
8. Economics – A Primer for India, G. Omkarnath, Orient Blackswan
9. Indian Economy, Ruddar Dutt and K.P.M. Sundaram, S. Chand & Co, New Delhi

Urban Sociology

1. Sociology, Anthony Giddens, Wiley
2. Sociology, John J. Macionis, Pearson
3. Urban Sociology : Images and Structure, Flanagan, William G., Prentice Hall
4. Urban Problems in Sociological Perspective, Shannon, Thomas R., Waveland Press Inc
5. The Metropolis and Mental Life, Simmel, Georg, New York: Free Press
6. Key Concepts in Urban Studies, M. Gottdiener, Sage London
7. Sociological Thought, Abraham M. F. and Morgan J. H., MacMillan India, Madras
8. The Oxford Companion to Sociology and Social Anthropology, Das Veena, Vol. I and II, OUP, New Delhi
9. Social Change in Modern India, Srinivas M. N., Oxford University Press, Delhi.
10. A Subaltern Studies Reader, Guha R., Oxford University Press, New Delhi
11. The Sage Handbook of Sociology, Bryn Turner et al, Sage
12. Capability and Well-Being, Sen, Amartya and M. Nussbaum. Oxford Clarendon Press
13. Inclusive Growth In India, R.U. Singh A.K. Thakur, Deep and Deep Publications
14. Sen's Capability Approach and Gender Inequality: Selecting Relevant Capabilities. Feminist Economics Robeyns, Ingrid
15. Planning a Barrier Free Environment, Office of the Chief Commissioner for Persons with Disabilities, India

MPLN0105: Demography and Quantitative Methods

Course Objective:

The course consists of two parts of Demography and Statistics, dealing with each independently and as well as connecting the applications of statistics to demography.

Demography

The objective of the course on Demography is to provide the students with an understanding of basic concepts on demography. This course would make the students aware of the importance of population geography in economic development, the various theories that explain the growth of population in a country and demographic techniques applied. The course aims to help students identify appropriate sources of data, perform basic demographic analyses using various techniques and ensure their comparability across populations. The student will also be able to produce population projections and interpret the information gathered by the different demographic methods.

Quantitative Methods

The emphasis of the course on Statistics shall be on conceptual underpinnings of statistics with a focus on defining different statistical tools indispensable for urban planning. In view of the course according more emphasis on inferential statistics than descriptive statistics, the objective of the course will be to introduce the most useful and commonly employed statistical tools and discuss the conditions under which use of those tools is appropriate. The course has been so designed as to train the students interpret the results of an analysis to provide insight into the answer to the problem at hand. Use of appropriate statistical analysis software's is also included in the course.

Course Contents:

Demography

- Distribution and Density of Population - Measures of Population Distribution and Concentration; Factors Affecting Population Distribution and Density; World Population Distribution; Density Distribution in India
- Population Change - Fertility and Its Measures; Mortality and Its Measures; Mobility; Factors Affecting Population Change; Determinants of Fertility and Mortality; Demographic Transition Theory; Some Population Theories (Overview only)
- Migration - Types of Migration; Determinants of Migration; Migration Models
- Population Composition - Age and Sex Composition and Its Determinants; Age Pyramids; Working Force and Its Determinants; Composition of Work Force and Occupational Composition
- Population Projections – Assumptions, Methods, Techniques

Statistics

- Measures of Central Tendency and Dispersion - Arithmetic Mean; Weighted Mean; Geometric and Harmonic Mean; Median and Mode; Variance and Standard Deviation
- Time Series and Forecasting - Trend Analysis - Cyclical Variation, Seasonal Variation, Irregular Variation; Various Methods in Time Series Analysis – Moving Average, Ratio to Trend, Link Relative and Residual
- Factor Analysis - Principal Component Analysis
- Probability Distribution and Sampling Distribution - Use of Expected Value in Decision Making; Binomial, Poisson and Normal Distribution (only application); Determination of Sample Size and Types of Sampling; Sampling Distribution (concept only); Design of Experiments (concept only)
- Correlation and Regression - Two Variable versus Multiple Linear Regression; Simple and Multiple Correlation; Estimation of Parameters – The Method of Ordinary Least Squares; Hypothesis Testing, Goodness of Fit
- Use of Excel Software for Analyzing Data; Applications of Features of Excel for statistical analysis; Introduction to other Statistical Analysis Software

Suggested Readings:

Demography

1. Demography, Peter R. Cox, Cambridge University Press
2. Studies in Demography, S.C. Srivastava et al, Anmol Publishers
3. Introduction to Applied Demography: Data Sources and Estimation Technique, William J Seraw, Sage Publishers
4. Patterns of Migration in the National Capital Region, National Institute of Urban Affairs (NIUA), New Delhi
5. India's Population Problems, S.N. Agarwal, Tata McGraw Hill Co., Bombay
6. Principles of Demography, D.J. Bogue, John Wiley, New York
7. Population Policy in India, P.K. Choubey, Kanishka Publications, New Delhi
8. An Econometric Study of a Metropolis, S.C. Gulati, Sage, New Delhi
9. Fundamentals of Demography, P.K. Majumdar, Rawat Publishers
10. Methods and Models in Demography, Colin Newell, Guilford Publications

Statistics

1. Statistics for Management, Richard I. Levin et al, Pearson
2. Econometrics Damodar Gujarati Tata Mc Graw Hill
3. Quantitative Methods: Theory and Applications, J.K. Sharma, Macmillan
4. Quantitative Methods for Business, Management and Finance, Swiff, Palgrave
5. Statistics, Larry J. Stephens, Tata McGraw Hill
6. Quantitative Techniques in Geography – An Introduction, Robert Hammond et al, Oxford University Press
7. Applied Statistics, P.K. Majumdar, Rawat Publications
8. The R Book, M.I. Crawley, John Wiley and Sons
9. Data Analysis and Statistics for Geography, Environmental Science, and Engineering, Acevedo M.F CRC Press

MPLN0106: Infrastructure Planning

Course Objective:

The course would include one part on the principles of transportation planning and another on services and utility networks and facilities.

Utility Networks Planning

The focus of the Utilities Planning course is on principles of design of utilities and services in urban and regional context and familiarising with Indian standards of design. The course will focus on acquainting students to latest technological innovations in utility services.

Transportation Planning

The objective of Transportation Planning is to provide basic information on transportation issues. Students will be familiarized with (i) geometric design of road networks and (ii) traffic characteristics. Techniques of data collection and analysis would be taught as part of this course.

Course Contents:

Utility Networks Planning

- Role of Physical Planner in Planning of Utilities and Services Networks; Objectives of Utilities and Services Planning and Its Implications for Public Health and Environmental Protection; Familiarizing to CPHEEO Manual and Guidance
- Water Supply Systems - Surface and Ground Water Sources, Quality and Quantity Requirements, Collection and Conveyance of Water; Water Requirement for Various Land Uses; Factors Affecting Water Demand; Calculation of Per Capita Requirement; Water Distribution Systems; Case Study Discussion on Innovative Methods and Successful Urban Water Supply System; Significance and Methods and Advantages of Water Harvesting System
- Storm Water Drainage Networks- Layout and Design of Storm Water System; General Considerations, Inlets, Self-Cleansing Velocity, Non-Scouring Velocity, Physical Layout, Design Principles, Data Requirement; Principles of Design of Storm Water Drainage System

- Sanitation and Sewer System - calculations of Quantity of Sewage; Sewage Disposal Methods and their Advantages and Disadvantages; Principles of design of Sanitary Sewer System Network; Case Study of Innovative Approaches of Sewage Disposal in Urban Area; Low Cost Appropriate Technologies for Sanitation; Characteristics of Waste Water, Industrial Pollutants and their Effects
- Solid Waste Management - Elements of Solid Waste Management, Classification and Characteristics of Solid Wastes; On Site Collection, Storage, Transportation and Disposal of Solid Wastes; Processing and Treatment of Solid Wastes; Land Filling and Cost Aspects of Different Methods of Solid Waste Management; Solid Waste Management Issues in Indian Cities
- Power Supply – Sources of Electricity; Transmission, Distribution and Supply; Sustainable Energy Planning.
- Telecommunications – Introduction to Planning and Programming Approaches for Telecommunication Infrastructure and Network Systems; Environmental, Social and Economic Impacts of Telecommunication Infrastructure
- Fire Fighting Services - Planning for Fire Protection Services and Space Standards; Locational Criteria, Implications on Land Use and Density

Transportation Planning

- Overview of Transportation Systems, Modes, Design and Operating Characteristics
- Classification of Roads, Road Networks and Hierarchy; Road Geometries and Road Components; Design and Preparation of Layout for Road Intersections, Rotaries and Signalized Intersections
- Traffic Volume, Origin Destination, Spot Speed, Speed and Delay
- Traffic and Transportation Surveys- Study Area Definitions, Surveys and their Types, Sampling of Travel Methods, Survey Techniques
- Parking and Pedestrian Issues
- Basis of Regional Network of Roads; Characteristics of National, State and District Highways; By-Pass Design Factors of Highways through Towns
- Introduction to basics concepts of Trip Generation, Distribution and Assignment
- Traffic Management- Existing Organizational and Legal Framework; Traffic and Environmental Management Techniques; Review of the Existing Traffic Management Schemes in Case Cities

Suggested Readings:

Utility Networks Planning

1. Environmental Engineering, Howard S. Peavy, Tata Mc Grawhill
2. Regulation and the Management of Public Utilities, C. S. Morgan, Gale
3. Water Supply Engineering, S. K. Garg, Khanna Publishers
4. Manual on Sewerage and Sewage Treatment, CPHEEO
5. Urban Planning Manual, AILGS Reader
6. Solid Waste Management, Krishana Gopi Sanoop P, Sasikumar K, Phi Learning
7. Solid Waste Management, Dewan, Sudarshan, Discovery Publishing House
8. Telecommunication Management Networks (TMN) Implementation, Amani Omer, Lambert Academic Publishers 6.
9. Firefighting: Management and Techniques, Overton Frank, Inkata
10. Water Supply Engineering: Environmental Engineering – I, Arun Kumar Jain, Ashok Kumar Jain, B. C. Punmia, Laxmi Publications

Transportation Planning

1. Traffic Engineering and Transport Planning, L.R. Kadiyali, Khanna Publications
2. Transportation Engineering and Planning, Author: C. S Papacostas, P. D Prevedouros, Publisher: PHI Learning
3. Principles of Urban Transport Systems Planning, B.G. Hutchinson, McGraw Hill
4. Urban Transport: Planning and Management, A K Jain, APH Publishing

MPLN0107: Planning Techniques

Course Objective:

The objective of the course Planning Techniques is to introduce techniques used for planning at various stages from preliminary to advanced. As this is a subject from integrated course the techniques broadly used by all courses of specialization have been considered while designing this course. At the end of the course student should be able to use the techniques in respective studio works. Appropriate Software applications in CAD and GIS would also be taught as part of this course.

Course Contents:

- Basic Terminology; Classification of Cities; City Region; Spheres of Influence, Urban Rural Fringe; Internal Structure of Urban Areas; Density Patterns; Land Use Classification and Coding
- Base map Preparation: Representation of Spatial Data; Choice of Appropriate Scales: Graphical, Linear and Areal Scales; Contents of Base Maps at Various Scales; Notations - Basic Disciplines of Maps
- Socio-Economic Surveys: Data Requirements for Urban and Regional Planning; Sources of Primary and Secondary Data; Questionnaire Design, Measurement Scale and their Application; Sampling Techniques; Types of Socio-Economic 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 for Conducting Regional Surveys; Regional Delineation Techniques: Factor Analysis, Cluster Analysis; Row Analysis; Case Studies in Regional Delineation
- Formulation of Spatial Standards for Residential, Industrial, Commercial and Recreational Areas; Space Standards for Facility Areas, Utilities and Networks; Population, Distance Criteria; Performance Standards; Case Studies: Residential and Non-Residential Density Patterns and Analysis
- Setting of Goals and Objectives; Methodologies for Preparation of Urban Regional Development Plans, Master Plans, Structure Plan and Strategy Plan Techniques; Plan Implementation Techniques; Public Participation and Plan Implementation; Techniques of Urban Renewal and Central Area Re-Development; Contents of a Master Plan, Regional Plan, Etc.
- Computer Applications for Data Collection and Analysis: Tools of Analyzing Different Types of Data; Use of Excel Software for Analyzing Data; Applications of Features of Excel- Basic and Selected Advanced Features;
- CAD Applications for Base Map preparation: Recapitulation of CAD tools- drawing, editing, modifying, layer management etc.; Scaling Drawings and Images; Plotting and Printing;
- **Introduction to Geoinformatics**
- Raster Data Capture: Types of Platforms: Space Bourne - Resource Satellite, Swath, Sensing Capabilities; Air Bourne – Aerial Photography; Ground Bourne – Digital Survey; Multi-Return Concept - Spectral Signature
- Raster Data Processing and Analysis: Image Interpretation – Qualitative and Quantitative Elements; Resolutions – Spatial, Temporal, Spectral, Radiometric; Geo-Rectification – Coordinate System, Datums, Geo-Referencing and Map Projections; Geometric Distortions, Image Enhancement, Transformation, Segmentation
- Data Creation: Thematic Model, Vector Data Features, Map Preparation – Digitization; Non-Spatial Data – Database Creation; Integration of Spatial and Non-Spatial Data; Data Query
- Data Analysis: Buffers, Overlay, Proximity, Network Analysis; 3D Terrain Modelling– Triangulated Irregular Network
- Data Presentation: Layout Preparation – Grids, Legend, Symbology; Printing – Sheet Size, Scale

Suggested Readings:

1. Urbanisation and Urban Systems in India, Ramchandran R. Oxford University Press

2. Cities Urbanisation and Urban Systems, Siddhartha K. and Mukherjee S., Kishalaya Publications
3. Regional Planning, Glasson J., Open University Press
4. Economic and Social Geography Made Simple, Knowles R. and Wareing J., Rupa and Company
5. Concepts and Techniques of Geographic Information Systems, Lo C.P. and Yeung A.K.W., PHI Learning Private Limited
6. Planning Techniques for AITP, Reader on Institute of Town Planners India
7. UDPFI Guidelines Volume 1, Ministry of Urban Affairs and Employment Govt. of India, New Delhi
8. Remote Sensing and Image Interpretation, Thomas M. Lillesand et al, John Wiley and Sons Ltd.
9. Remote Sensing and GIS, Basdudeb Bhatta, Oxford University Press
10. Spatial Analysis, Mark R. T. Dale, Marie-Josée Fortin, Cambridge University Press

FIRST YEAR: SECOND SEMESTER

MPEP0201: Environmental Planning Studio - I (Regional Issues)

Course Objective:

India is situated in the middle of "Afro tropical, Euro- Asian and Indo Malayan region" and is one amongst the 12 mega biodiversity country of world. The diverse geographical regions across India are hills, deserts, plains, coastal areas, plateaus, and islands. The main objective of this studio is to develop an understanding of the environmental issues in any one of the geographical regions of India. Students will apply theoretical knowledge of planning, management and best practices in evaluating suitable alternatives for minimizing the adverse impacts on the environment and society at large. This would involve application of various planning techniques, methods and other tools in arriving at an appropriate solution to protect environment of the selected region.

Course Contents:

The studio exercises will aim at identifying the key issues of a selected region and develop an environment improvement plan with the following thrust:

- To establish limits of the study area
- To identify environmental issues in study area
- To develop an understanding of the socio-economic environment and the existing environmental quality
- To identify threats and opportunities
- To identify concerns of local people
- To explore best practices for improving existing resources and identify environmentally sound technologies or policies to prevent and resolve environmental problems
- To ensure proper rehabilitation of population affected by developmental activities and co-operation of local people

MPEP0202: Environmental Impact Assessment

Course Objective:

EIA is one of the successful policy innovations of the 20th Century for environmental conservation and has become one of the most widely used tools for ensuring sustainable development. Students will be acquainted with procedures, methods, documentation techniques and management practices of EIA to not only minimize adverse impacts of human actions on environment and society but also strategies that seek to proactively manage these issues.

The course objective is to equip students with sound technical knowledge and provide exposure to wide range of projects through case studies. The focus is to provide theoretical as well as practical knowledge to plan and carry out an environmental impact assessment and environmental management plans in compliance with the environmental clearance procedures in India.

Course Contents:

- Introduction to EIA: Purpose of EIA, Steps in EIA Process, Hierarchy in EIA, Impact Indicators; Evolution of EIA Worldwide and in India; Constitutional Provisions and Policy Regulations in India; EIA Notifications; Institutional Arrangement
- EIA Methods and Techniques
- Concept of Significant Impacts, Alternative Evaluation, Determination of Environmental Impact Importance, Determination of Weightages, Measurement of Impacts, Impact Prediction and Evaluation and Mitigation
- Prediction and Assessment of Impact on Following Environment Factors: Air Systems and Water System; Land/Soil and Ground Water; Noise and Energy; Cultural Resources; Biological Resources; Visual Aspects; Socio Economic Aspects
- Comparison of Alternatives
- Objectives of People's Participation, Advantages and Disadvantages of People's Participation, People's Participation Techniques : Public Hearing
- EIA Reports Content, Basis and Criteria for Evaluation of EIA Reports and EIA, Evaluation Procedures

- EIA Monitoring and Auditing
- Introduction to Environmental Management Plan (EMP), Preparation of EMP, Types of EMPs, EMPs Structure and Document Description
- Concepts of Cleaner Development Mechanism, Ecological Foot Printing, Life Cycle Analysis, Carbon Emission Trading, Cleaner Production Concepts and Practice, Concept of 3-Rs.
- Pollution Control Measures for Industrial Wastes, Hazardous Wastes, Biomedical wastes, Domestic Waste Water, Air Pollutants and Noise
- Environment Management Systems and Need of ISO, ISO-14001 and its Planning Implications, Environmental and Financial Benefits of ISO. Development of an EMS, Certification and Environmental Auditing
- Strategic Environment Assessment (Rationale and scope, Overview of SEA process, Benefits and constraints)
- Effectiveness of EIA towards sustainable development, EIA Auditing, Future Trends in EIA

Suggested Readings:

1. Guidelines to Environmental Impact Assessment in Developing Countries, Ahmad Y. J. and Swamy G. K., Hodder & Stoughton, London
2. Environmental Impact Assessment, Biswas A.K. and Agarwala S.B.C., Butterworth-Heinemann, Oxford
3. The Sustainable Urban Development Reader, Wheeler S.M. and Beatley T., Routledge
4. Environmental Impact Assessment, Canter, L.W., Mc. Graw Hill, New York
5. Handbook of EIA, Kulkarni V. S., Kaul S. N., Trivedi R. K., Scientific Publishers, India
6. EIA Manual, Ministry of Environment and Forests, Govt. of India
7. Methods of Environmental Impact Assessment, Morris P. and Therivel R., UCL Press, London
8. Environmental Impact Assessment: Theory and Practice, Wathern P et al., Routledge, London
9. Environmental Planning and Impact Assessment in Practice, Weston J., Addison Wesley Longman
10. Best Practices Environment, The Economist, Intelligence University Press
11. Introduction to Environmental Management, Theodore M.K. and Theodore L.
12. Environmental Management, Kulkarni V. and Ramachandra T. V., TERI Press, New Delhi
13. Essay on Adoption of Environment Management Practices: Corporate Environmental Policies and ISO 14001, Montiel I, ProQues
14. Global Green Standards: ISO 14000 and Sustainable Development, International Institute for Sustainable Development
15. Auditing for Environmental Leadership – Beyond Compliance for Environmental Excellence, John T. Willig, John Wielly & Sons
16. The Limits of Growth, Meadows D. H., Meadow D. L., Randers J. and Behrens W. W., Earth Island Ltd, London

MPEP0203: Environmental Policies and Legislation

Course Objective:

The concern for the environment and the requisite policies can be put into action with the help of enabling legislative provisions. The law related to environment is rapidly growing as a complex regulatory mechanism which increasingly reflects public concern over issues like air, water, noise, conservation of forests and wildlife, depletion of natural resources. Government of India have taken a number of steps in recent years by making policies and introducing a number of legislations to protect environment. The course aims at sensitizing students with prevailing environmental policies and legal framework. The course will build knowledge base of students for evaluating proposals of developmental activities in compliance with environmental standards and legal requirements.

Course Contents:

- Environment and Constitution: Meaning, Significance and Objectives of Environmental Policy and Legislation; Aims and Ideals of constitution; Constitutional Basis and Provisions Relating to Environment, Its Development and Use
- Introduction to Environmental Policies and Historical Overview of Environmental policies (Pre-Independence and Post-independence era).; An overview of Relationship between Environmental policies and Economics, Industries, Agriculture etc in so far as their Impact on Ensuring Sustainable Development/Environment ; Environmental Policy Instruments ; National Environmental Policies and Programmes in India
- Basic Principles of Environmental Laws: Private and Public law; Principles of International law; Indian Environmental Laws; International Institutions; Key International Treaties; Objectives and Principles of Legislations
- Governance in Environmental Law and Policy: Government institutions and their competencies; Role of the government institutions
- Environmental Legislations in India: Evolution of Indian Legislation(Brief Overview of environment related laws in India); Environmental Movements; Union Government Initiatives
- Indian Environmental Acts, Laws and Notification
- Programmes and Policies Update; Court Based Laws; Issues and Cases brought before the Courts by Public Interest Litigants; Landmark Judgements by Supreme Court
- Landmark Environmental Law Cases (International and National)
- Management through Legislation
- Role of Environmental Planner as Professional at various Levels and Organizations

Suggested Readings:

1. Environmental Laws, Universal Law Publishing Co.
2. Handbook of Environmental Law, P.B. Sahasranaman, Oxford University Press
3. Environmental Law in India, Mohammad Naseem, Kluwer Law International
4. Environmental Laws in India, A.K. Tewari, Deep and Deep Publications, New Delhi
5. Environmental Law & Practice Review : Volume 1, NALSAR, NALSAR Research Publication
6. Handbook of Environmental Law, P.B. Sahasranaman, Oxford University Press
7. Environmental Justice in India, C. M. Abraham, Kluwer Law International,

MPEP0204: Environmental Economics and Finance**Course Objective:**

The course is divided into two parts, first part dealing with environmental economics and second part dealing with environmental finance. The primary objective of the course is to study the scope of economic theories related natural resources as well as the limitations of economic analysis to provide policy guidance to environmental issues. The main focus of the course is on the theory of externalities and regulation as applied to environmental problem. The course is designed to increase the student's ability to analyse environmental policies through a deeper understanding of economic behaviour and incentives, economic institutions, property rights and contracts. Besides appraising the students about major environmental statutes containing funding programmes, the course intends to deal with the environmental projects funded by multilateral grants.

Course Contents:

- Introduction to Environmental Economics - Economics of Environment; Environment and Growth; Economic Efficiency - Cost Effectiveness Analysis and Cost-Benefit Analysis; International Issues; Economics and Politics
- Economy and Environment - Economics of Natural Resources; The Fundamental Balance; Emissions, Ambient Quality and Damages; Pollution Control and Instrument Choice
- Analytical Tools in Environmental Economics - Measurement of Benefits and Costs; The Coase Theorem – Equi Marginal Principle, Game Theory in Environment (concepts only); Markets and Economic and Social Efficiency

- Environmental Protection - Social Choice on Environmental Protection; Biocentrism and Anthropocentrism; Individual Preference and Social Choice; Pareto Optimality; Pigovian Tax and Kaldor Hicks Compensation Principle (concepts only); Social Welfare Function (concepts only); Utilitarianism
- Environmental Analysis - Impact Analysis; Cost Effectiveness Analysis; Risk Analysis; Benefit Cost Analysis
- Environmental Policy Analysis and International Policy Issues - Criteria for Environmental Policy Evaluation; Property Rights; Command and Control Strategies – The Standards; Incentive Based Strategies; Comparative Study of Environmental Policies; The Global Environment – Climate Change, Ozone Depletion, Global Warming and Biological Diversity; International Environmental Agreements– The Kyoto Protocol; Joint Implementation and Clean Development Mechanism; The Copenhagen Accord; The Regional Green House Gas Initiative
- Environmental Finance - International Trade and Environment; Environmental Funding – Survey of International Sources of Environmental Funding; Carbon Tax, Carbon Trading, Cap and Trade

Suggested Readings:

1. Environmental Economics, Charles Kolstad, Oxford University Press
2. The Theory of Environmental Policy, William J. Baumol and Wallace E. Oates, Cambridge University Press
3. Advanced Microeconomic Theory, Geoffrey Jehle and Philip Reny, Addison-Wesley
4. Environmental and Natural Resource Economics, Tietenberg Tom, Boston: Addison Wesley Inc.
5. Economics of the Environment: Selected Readings, Stavins Robert N. et al., Norton & Company, New York
6. Environmental Economics - An Introduction, Barry C. Field and Martha K. Field, McGraw-Hill Irwin
7. Environmental Economics, Barry C. Field, Mc Graw Hill International
Environmental Ethics: The Big Questions, Keller D.R., et al., Wiley- Blackwell

MPEP0205: Disaster Mitigation and Environmental Management

Course Objective:

The subject intends to familiarise the students with the meaning, factors, significance, causes and effects of disasters, to understand the nature and importance of disaster management, gain an understanding of the tools for hazard and vulnerability assessment at various levels, preparedness and focuses on techniques for preparing effective disaster management plan. The course will also provide enhanced understanding of community based approaches to disaster management covering mitigation, preparedness, response, rehabilitation and reconstruction

Course Contents:

- Introduction to the Concept of Disaster Management; Types of Natural and Non-Natural Disasters, Causes and Impact; Distinction Between An Emergency and a Disaster Situation; Distinction between Hazard and Disaster; Regional Understanding of the Hazards to Which our Region May be Vulnerable and its Implication
- Trend in Urban Development and Challenges before Urban Administrators in Risk Reduction; Concepts and Overview of Technological Hazards at the City Level. Major Accident Hazards in Industries, Storages and Ports
- Hazard and Vulnerability Assessment, Concepts, Tools and Techniques. Pre-Disaster Mitigation and Protection of Lifelines and Critical Facilities against Natural Hazards
- Disaster Management Act
- Disaster Management Plan, Incident Command System
- Safety Management System: Strategies for Implementation, Emergency Planning, Preparedness And Response At The City Level

- Principles and Methods Of Community Based Approaches for Urban Disaster Management; Community Based Disaster Management Practice; Building Community Capability; Education and Training on Mitigation and Emergency Planning
- Resilience: Disaster risk reduction; Risk preparation; Adaptation

Suggested Readings:

1. National disaster management guidelines: Preparation of state disaster management plans, National disaster management authority, Government of India
2. Disaster Management, G.K. Ghosh, A.P.H. Publishing Corporation
3. Disaster Management, R.B. Singh, Rawat Publications
4. Disaster Management: Through the New Millennium, Ayaz Ahmad, Anmol Publications
5. Emergency Medical Services and Disaster Management: A Holistic Approach, P.K. Dave, Jaypee Brothers Medical Publishers (P) Ltd.
6. Disaster Management, B Narayan, A.P.H. Publishing Corporation
7. Modern Encyclopedia of Disaster and Hazard Management, B C Bose, Rajat Publications
8. Disaster Management, Nikuj Kumar, Alfa Publications
9. Disaster Management - Recent Approaches, Arvind Kumar, Anmol Publications
10. Tsunamis: Threats and Management, Jagbir Singh, I.K. International
11. Disaster Management: Future Challenges and Opportunities, Jagbir Singh, I. K. International
12. Town Planning Guidelines for Disaster Management Vol-I & Vol-II, TCPO, India

MPEP0206: Environmental Monitoring and Assessment Lab

Course Objective:

Objective of this course is to make students aware of different techniques of monitoring of various components of environment such as air, water and land. This would be done through practical exposure of measuring techniques in laboratory.

Course Contents:

- 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 Models
- Water Pollution – Sources, Water Quality Tests, Minimum Standards of Disposal (for Different Uses), Performance Criteria
- Noise Pollution – Sources, Techniques of Measurement, Noise Level Standards, Noise Levels
- Land Pollution – Sources, Soil Erodibility Tests, Minimum Standards of Disposal (Minimum Standards for Different Uses), Performance Criteria

Suggested Readings:

1. Pollution Prevention, Bishop P.L., Waveland Press, Inc.
2. Handbook of Environmental Management and Technology, Burke G., Singh B., and Theodore L., John Wiley & Sons, Hoboken, NJ
3. Central Public Health and Environmental Engineering Organization (CPHEEO). Manual on Municipal Solid Waste Management, 2000
4. Central Public Health and Environmental Engineering Organization (CPHEEO). Manual on Sewerage and Sewage Treatment, 1993
5. Central Public Health and Environmental Engineering Organization (CPHEEO). Manual on Water Supply and Treatment
6. Handbook of Chemical and Environmental Engineering Calculations, Reynolds J.P., Jeris J.S., and Theodore L., John Wiley & Sons, Hoboken, NJ
7. Introduction to Environmental Management, Mary K. Theodore and Louis Theodore, CRC Press
8. MWH. Water Treatment: Principles and Design, John Wiley & Sons, Hoboken, NJ

MPEP0207: Geoinformatics Lab for Environmental Planning

Course Objective:

The course aims to equip students with the advanced concepts of Geoinformatics with special emphasis on applications in Planning.

Course contents:

- Overview: Principles and Applications of Remote Sensing (RS), Geographic Information Systems (GIS) and Photogrammetry; Organisational Aspects for Environmental Planning; Systems, Nature, Hierarchy, Value and Type of Required Spatial Data, Raster and Vector Data Structures, Spatial Data Models, Geo-Database, Analysing Tools and Software. Global Navigation Satellite Systems; Electromagnetic Spectrum and Band Reflectance; Image Interpretation and Analysis
- Information System - Information Needs, Scales and Levels, Pre-Conditions for using Planning Information Systems; Representing, Modelling and Impact Analysis of the Environment Data; Structure Models; Query Measurement and Transformations; Summary Statistics and Inference; Terrain Modelling
- Data Creation and Checking - Base Maps and Thematic Maps, Mapping and Spatial Analysis, Linking of Attribute Data, Spatial Data Aggregation; Spatial Information, Database Creation; Geo-Coding and Data Accuracy, Topology Creation
- Spatial Hydrography and Landforms; Digital Change Detection; Environmental Suitability Analysis; Environmental Issues such as Disaster Management (both natural and man-made); Landuse/Landcover Analysis; Use of GIS Data Focusing on Environmental Planning such as Waste Management, Natural Resource Management, Transportation Management etc.
- Laboratory Exercises – in Selected Packages (e.g., ERDAS Imagine, ArcGIS, LPS, etc.); Dynamic GIS; Integration of GIS and Digital Image Processing; Integration of GIS and GPS

Suggested Readings:

1. Geographic Information Systems and Science, P.A. Longley et al., John Wiley and Sons Ltd.
2. Remote Sensing and Image Interpretation, Thomas M. Lillesand et al., John Wiley and Sons Ltd.
3. GIS, Spatial Analysis, and Modelling, David J Maguire et al., ESRI Press
4. Remote Sensing and GIS, Basdudeb Bhatta, Oxford University Press
5. Remote Sensing and GIS Integration: Theories, Methods and Applications, Qihao Weng, Mc Graw Hill Professional
6. Applied Remote Sensing in Urban Planning, Governance and Sustainability, Netzband, Springer, India
7. Advanced Surveying: Total Station, GIS and Remote Sensing, Satheesh Gopi, Pearson
8. Landuse Change Detection using GIS, Remote Sensing and Spatial Matrices, Mesfin T. Bekalo et al., Lap Lambert Academic Publications
9. Land Sustainability Evaluation using GIS and Remote Sensing Technology, Mezenia Mengist, Vdm Verlag
10. Environmental Modelling with GIS and Remote Sensing, Andrew Skidmore et al., CRC Press

SECOND YEAR: THIRD SEMESTER

MPEP0301: Environmental Planning Studio – II (Sectoral Issues)

Course Objective:

To develop the capabilities of the students to address sectoral issues pertaining to environmental concerns in urban areas. This would be accomplished by taking studies for a specific project.

Course Contents:

- Principles of Environmental Impact Assessment, its methodology, report structure, its approval process
- Principles of Environmental Management Plan, its methodology, report structure, its approval process

The class will be divided into groups and projects will be assigned to them.

An illustrative list of projects can include -

- Road development
- Storm water drainage system
- Water Supply system
- Sewerage System
- Beach development
- Water bodies such as lakes, river, back water
- Industrial area development
- Housing
- Watershed management
- Mining
- Urban forestry

MPEP0302A (Common Pool Elective): Energy Accounting and Auditing

Course Objective:

The main aim of the course on Energy Accounting and Auditing is to sensitise the students that there are ways and means by which goods and services can be provided with the least cost and least environmental effect. The course would impart information about energy conservation programmes covering essentially energy utilization analysis and evaluation of energy conservation measures. The students would also learn about monitoring and analysis techniques of use of energy. Some work will also be done for preparing technical reports and give recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption in select case examples.

Building industry being one of the largest sectors in the world using a high percentage of energy, students will therefore be introduced to the concept, components and practices of green building.

Course Contents:

- General Energy Problem: Energy Use Patterns and Scope for Conservation
- Energy Audit: Definition, Need and Types of Energy Audit; Energy Management (Audit) Approach, Energy Monitoring, Energy Accounting and Analysis
- Energy Management, Energy Management Information System. Energy Audit Instruments; Energy Conservation Act; Duties and Responsibilities of Energy Manager and Auditors
- Electrical Energy Conservation in Building, Heating and Lighting, Domestic Gadgets, Such as Energy Efficient Motor, Pump and Compressor, Etc.
- Energy Management in Industries, Energy Conservation in Boilers, Steam Turbine and Industrial Heating System; Cogeneration and Waste Heat Recovery; Thermal Insulation; Heat Exchangers and Heat Pump
- Thermal Energy Audit in Heating, Ventilation and Air Conditioning. Building System Energy Audit

- Tariffs and Power Factor Improvement in Power System, Load Curve Analysis and Load Management
- Building Design: Assessment of Need of Energy. Building Materials, Role of Building Design to Evaluate the Energy Performance, Parameters Affecting Energy Consumption, Energy Saving Potential
- Energy Survey and Energy Audit of Buildings. Calculation of Energy Inputs in Buildings. Energy Audit Reports of Buildings
- Introduction to Green Building; Past, Present and Future of Green Building Movement
- Introduction to Energy Rating of Buildings
- Green Building through Integrated Design; Building a Certified Green Building from Concept to Design to Construction
- Green Building Materials and Construction – Alternative, Natural and Sustainable Building Materials; Recycling and Construction Ecology
- The Future of Green Buildings – Net Zero, Passive Design Etc.

Suggested Readings:

1. Hand book of Energy Audits by Albert Thuman, P.E.,C.E.M.
2. Energy Management, Murphy & Mckay,,BSP Books Pvt. Ltd.
3. Energy Management Principle, Smith CB, Pergamon Press, New York
4. Optimising Energy Efficiency in Industry, Rajan GG, TMH
5. Energy Management, Callaghan P O, McGraw-Hill Book Company
6. Handbook on Energy Audit and Management, Amit Kumar Tyagi, Tata Energy Research Institute
7. Study material for energy Managers and Auditors Examination: Paper I to V, Bureau of Energy Efficiency
8. Energy Auditing and Conservation; Method Measurement, Management & case study, Hamies, Hemisphere, Washington.
9. Industrial Energy Management Utilisation, Witty, Larry C, Hemisphere Publishers, Washington
10. Energy Management and Conservation Handbook, Kreith & Goswami, CRC Press.
11. Energy Conservation in Building publication by Indian Building Congress
12. Climate Responsive Architecture- A Design Handbook of Energy Efficient Buildings, Krishan, TMH
13. Electrical Installation Estimating & costing by J.B. Gupta
14. The Green Building Revolution, Jerry Yudelson and S. Richard Fedrizzi
15. Green Building Through Integrated Design, Jerry Yudelson
16. GRIHA Manual (Volume 1-5)
17. LEED Handbook
18. The Alternative Building Sourcebook: Traditional, Natural and Sustainable Building Products and Services, Steve K. Chappell
19. Ecology of Building Materials, Bjorn Berge and Filip Henle

MPEP0302B (Common Pool Elective): Water Resource Management

Course Objective:

Over the years, the demand for water has increased phenomenally due to a consistent increase in population, growing urbanisation, industrialisation and increasing demand for agricultural produce. This has also resulted in over exploitation of limited surface as well as ground water resources, and as a consequence, consistently and continuously depleting ground water table.

Thus, the main objective of this course is to sensitize students for the need to conserve and augment water resources. Students will learn various strategies and management techniques for conservation and augmentation of water resources, particularly in view of the ever rising demand for water from various competing sectors.

Course Contents:

- Introduction to Status of Water Scenario, Rainfall Patterns, Scarcity Issues, Cause and Effect

- Physical Hydrology
- Traditional Water Management Knowledge
- Integrated Water Resource Management
- Water strategies and Policies
- Urban and Rural Water Supply and Demand Management, Issues and Challenges
- Rainwater Harvesting and other Techniques
- Surface Water/Irrigation Management, Issues and Challenges
- Ground Water Issues, Management and Challenges
- Capacity Building and Developing Awareness about Water Management
- Institution Building and sensitization about Importance of Water

Suggested Readings:

1. Water Resources Management: Principles, Regulations, and Cases, Neil S. Grigg, McGraw Hill Professional
2. Water Resources Planning and Management: Proceedings of the International Conference on Water, Environment, Ecology, Socio-Economics and Health Engineering (Weeshe), Seoul National University, Seoul, Korea, 1999
3. Integrated Water Resources Management in Practice: Better Water Management, Global Water Partnership, R. L. Lenton, Mike Muller
4. Global Perspectives on Integrated Water Resources Management Vasudha Pangare, Ganesh Pangare, Viraj Shah

MPEP0303A (Elective-I): Green Infrastructure

Course Objective:

Sustenance of crucial ecosystems is essential to achieve sustainable development. Green Infrastructure planning approach ensures efficient and sustainable land use by integrating interacting functions or activities in an area. The objective of this course is to sensitize students about the importance and role of maintaining ecosystem functions to ensure that city infrastructure is spatially and functional coherent. The course will highlight the importance of green infrastructure in preventing the loss of bio- diversity through landuse planning, conservation measures and policy interventions.

Course Contents:

- Definitions of Green Infrastructure, Its Significance to Urban Planning, Components and Hierarchy of GI; Regional Parks and Reserves, Protected Areas, Community Parks and Open Spaces, Conservation Corridors, Urban Rivers, Green Belts Etc.
- Economic, Social and Environmental Benefits of Green Infrastructures, Ecosystem Services, Conceptual Exploration of 'Green Growth' Idea
- Objectives of GI Planning From Regional to Neighborhood Scale; Land Conservation, Biodiversity Conservation, Protection of Fragmented Ecological Habitats, Restoration of Disturbed Habitats, Ecotourism, Managing Disaster Risks, Ameliorating Urban Heat Island Effect and Energy Conservation, Urban Space Quality, Community Health, Etc.
- Approaches for Planning Green Infrastructures; Integration with Land Use Planning, Making Grey and Blue Infrastructures Efficient, Urban Regeneration through Enhanced Urban Landscapes and Design, Community Participation

Suggested Readings:

1. Green Infrastructure: Linking Landscapes and Communities, Benedict M.A. & McMahon E.T., Island Press, Washington, DC.
2. Planning for an extensive open space system: linking landscape structure and function, Landscape and Urban Planning, Ahern J., 1991, 21, 131-45.
3. Principles of Ecosystem Stewardship: Resilience-Based Natural Resource Management in a Changing World, Chapin III F.S., Kofinas G.P. & Folke C. (eds.), Springer, New York.
4. The Economic Benefits of Parks and Open Space, Lerner, Steve and William Poole , San Francisco: The Trust for Public Land.

5. Land and Natural Development (LAND) Code: Guidelines for Sustainable Land Development (Wiley Series in Sustainable Design), Balmori D., John Wiley & Sons, New York.
6. Applying Ecological Principles to Land Management, Dale Virginia H. and Haeuber R.A., Springer-Verlag, New York,
7. The New Economy of Nature: The Quest To Make Conservation Profitable, Daily G. & Ellison K., Island Press, Washington, DC.
8. Weber, T., Sloan, A., Wolf, J., (2006) Maryland's Green Infrastructure Assessment: Development of a comprehensive approach to land conservation, Landscape and Urban Planning, Weber T., Sloan A., Wolf J.

MPEP0303B (Elective-I): Bio-diversity and Eco-tourism

Course Objective:

This course introduces students to the diversity of living organisms and discusses the ways in which people directly or indirectly depend on a range of species. The course also includes contribution of eco-tourism to safeguard biodiversity and ecosystem functions. The objective is to develop knowledge and understanding of the importance and role of biodiversity in maintaining healthy environment.

Course Contents:

- Urban Biodiversity
- Understanding and Application of Keys to Modern Genetic Techniques such as Genotyping and Fingerprinting
- Understanding the Importance of Evolutionary Significant Units (Esus) in Conservation of Biodiversity.
- Impacts on Biodiversity and Ecosystems of Invasive Non-Native Species
- Agricultural Practices Affecting Mass Extinction Events, Afforestation and Deforestation, Climate Change, Human Activities Etc.
- Impact of Biodiversity on Ecosystem Functioning
- Wildlife in Different Ecosystems; Role of Wildlife to Protect Biodiversity
- Reasons of Destruction of Wildlife - Overkill, Habitat Destruction and Fragmentation
- Impact of Introduced Species and Chains of Extinction
- Wildlife Corridors; Endangered Species; IUCN Red List and Blue List of Species, Methods of Conservation of Wildlife; Eco-Tourism Its Role in Improving Sustainability
- Evidences in History; Selection Criteria of Sites for Promoting Ecotourism
- Regulation and Accreditation; Guidelines and Education
- Negative Impact of Tourism; Direct and Indirect Environmental Impacts; Environmental Hazards
- Opportunities and Threats for Local People- Displacement of People, Threats to Indigenous Cultures, Livelihood Opportunities, etc.
- Role of Ecotourism, Biodiversity and Wildlife in Protecting Environment; Initiatives at Global and Local Level; Policies to Protect Biodiversity and Wildlife

Suggested Readings:

1. Biodiversity Resources for Environmental Literacy, Environmental Literacy Council, NSTA Press, United States of America
2. The living planet in crisis: Biodiversity science and policy, Cracraft J. and Grifo F. T., Columbia University Press, New York
3. Proximate causes and underlying driving forces of tropical deforestation, Geist H. J., and Lambin E.
4. Humans and other catastrophes: Perspectives on extinction, American Museum of Natural History, Meine C. , Center for Biodiversity and Conservation, New York
5. Biodiversity: An introduction, Gaston K. J., and Spicer J. I., Blackwell Publishers
6. The sixth extinction: Biodiversity and its survival, Leakey R. and Lewin R., Orion Publishing, London

7. Sharing the Benefits of Biodiversity: the Kani-TBGRI Deal in Kerala, India, Anuradha R. V. Kalpavriksh Environment Action Group, Pune
8. Terminological and methodological aspects of the mapping and analysis of global biodiversity, Barthlott W., et. al., 1999
9. Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience, Berkes F. and Folke C., Cambridge University Press, Cambridge
10. Ecotourism and Environmental Sustainability: Principles and Practice, Hill J.L., Gale T., Ashgate publishing limited
11. Environmental Impacts of Ecotourism (Ecotourism Series), Buckley R. C., Revised edition, CABI
12. Ecosystems and Human Well-being: Current Status and Trends, Millennium Ecosystem Assessment, Finlayson C.M. and D'Cruz R, Island Press, Washington, DC

MPEP0303C (Elective-I): Natural Resource Management

Course Objective:

This course provides an overview of the main management issues which relate to natural resources, particularly land, water, biodiversity, forests and fisheries. The range of topics covered in the course will provide students with a wider perspective on many national and international natural resource management issues and challenges. The focus of the course is to develop understanding for linking community resource management systems with macro-level policies and programmes to create long-enduring management systems.

Course Contents:

- Introduction to Natural Resource Management – Overview of the Subject – Need and Scope; Basic Concepts of Natural Resource Management like Common Property Rights, Collective Action, Traditional Knowledge about Natural Resources Management, Community Based Natural Resource Management
- Land- Perception of Land Degradation; Understanding the Causes of Land Degradation; Land Management Practices; Like Soil Conservation, Watershed Management, Management Issues and Challenges
- Water- Water Supply and Demand, Water Quality Issues, Understanding the Causes, Water Management Practices, Management Issues and Challenges
- Biodiversity- Biodiversity Services and Human Well-Being; Global and National Trends in Biodiversity Loss; Understanding the Causes, Biodiversity Management Practices, Management Issues and Challenges
- Forests- The Principles of Sustainable Forest Management; Forests and Economic Development; Forest Ecosystem Services; Forest Certification Schemes; Community Forest Management. Joint Forest Management, Management Issues and Challenges
- Wildlife And Fisheries- Conserving Wildlife through Sustainable Use; The Drivers of Marine Fisheries Depletion. Current Approaches to Implementing Sustainable Fisheries Management, Management Challenges and Issues

Suggested Readings:

1. The Science of Sustainable Development: Local Livelihoods and the Global Environment, Jeffrey Sayer, Cambridge University Press
2. Governing the Commons: The Evolution of Institutions for Collective Action, Elinor Ostrom
3. Community Forest Management in Tribal States of India (with special reference to Madhya Pradesh), Dasgupta S. and D. Debnath, International Book Distributors
4. Criteria and Indicators for Sustainable Forest Management, Kotwal P.C. and M.D. Omprakash, International Book Distributors, Dehradun
5. Natural Resources, Agarwal et. all, International Institute for Environment & Development
6. Forest Certification: A Tool for Sustainable Forest Management, Yadav M., P.C. Kotwal and B.L. Menaria, ISBN: 81-7969-047-4
7. Ecotourism and Livelihoods, Bhattacharya A.K., Concept Publishing Company, New Delhi
8. A Methodological Framework for Gender Participation in Agricultural Resources: A Study of Jhabua District of M.P., Singh S.P. and K.N. Krishna Kumar

9. New Dimension of Women Empowerment In India, Sinha Ajit, Deep and Deep Publisher, New Delhi
10. Anthropology-New Global Order and other essays in Era of Globalisation: Issues and Concerns and Other Essays, K.K. Mishra (ed.), Concept Publishing Company, New Delhi
11. Management of Natural Resources for Sustainable Livelihood and Poverty Alleviation – Volume II, NIRD, Hyderabad

MPEP0304: Project Appraisal and Environmental Management

Course Objective:

The objective of the course on Project Appraisal and Management is to train the students in managing a project right from its conception to evaluation. The organisation of the course has been so designed that it graduates from concept to application on all aspects of project management. Besides imparting the application techniques relevant for the concerned topic, students would also be made familiar with Microsoft Project in performing simple project management tasks.

Course Contents:

- Definition of Project and Project Management; Importance of Project Management; Stages of Project Life Cycle; Causes of Project Delay; Behavioural Aspects of Project Management; Role of Project Manager; Attributes of a Successful Project Manager
- Introduction to Project Appraisal; Types of Feasibility; Financial and Economic Appraisals; Ascertaining Project Costs and Benefits; Project Financial Appraisal Techniques – Payback Period, Benefit Cost Ratio, Net Present Value, Internal Rate of Return; Components of a Feasibility Study; Social Cost Benefit Analysis (Concept only)
- Introduction to Project Planning; Process of Project Planning; Project Planning during Investment Phase; Planning for Project Work (Work Breakdown Structure); Planning for Manpower and Organisation; Planning for Project Finance; Planning for Information System; Process of Project Formulation; Constraints in Project Formulation; Breakeven Analysis; Sensitivity Analysis (Concept only); Project Budgeting and Performance Budgeting
- Definition of Project Scheduling; Steps in Project Scheduling; Network Techniques in Project Scheduling; Activity on Arc/Node; Forward Pass and Backward Pass; Critical Path and Slack; CPM Simulation; PERT (Concept only); Gantt Chart (Concept only)
- Definition of Project Monitoring; Criteria for Decision Making; Parameters and Tools of Control; Use of Network Analysis in Project Monitoring; Analysis of Cost and Time; Reporting and Corrective Actions; Resource Management – Resource Loading and Resource Levelling; Project Reporting
- Types of Project Evaluation; Tools of Project Evaluation; Time Frame in Evaluation; Project Cash Flows – Elements of Cash Flow Stream; Principles of Cash Flow Estimation; Project Benefits; Sources of Funds – Disposition of Funds; Financial Closure
- Objectives of Public Procurement; Steps in Procurement; Preparation, Publication and Processing of Bids; Pre Bid Meeting; Bidding Stages; Eligibility of Bidders; Quality and Cost Based Selection; Quality Based Selection; Types of Contract; Essentials of Good Contract Management; Contracting Process and Contract Administration; Termination of Contract; Payment Clauses; Dispute Resolution

Suggested Readings:

1. Construction Project Management : Planning, Scheduling and Controlling, K.K. Chitkara, Tata Mc Graw Hill
2. Project Management, Clifford F Gray et al., Tata Mc Graw Hill
3. Construction Project Management, Kumar Neeraj Jha, Pearson Education
4. Project Management – FAQ, G.P. Sudhakar, Goltatia Publication
5. Project Management, Vinod M. Patel, Oxford Book Company
6. Project Management, S. Choudhury, Tata Mc Graw Hill

7. Project Management – A Managerial Approach, Samuel J. Mantel, Wiley India
8. Essentials of Project Management, Ramakrishna Kamaraja, Phi Learning
9. Project Management, R.C. Sinha, Alpha Publications
10. Projects: Planning, Analysis, Selection and Review, Prasanna Chandra, Tata Mc Graw Hill
11. Project Management for Business and Technology, John M Nicholas, Prentice Hall of India Pvt. Ltd.
12. Project Planning, Scheduling and Control, James P Lewis, Tata Mcgraw-Hill Publishing Co. Ltd.

MPEP0305: Climate Change and Human Settlements

Course Objective:

The objective of this course is to make students aware of the scenario of climate change and to provide exposure on discussions happening at national and international levels. After attending this course, the students will be in a position to appreciate the role of settlements in climate change mitigation at the same time they will be able to address impact and adaptations issues faced by human settlements.

Course Contents:

- Understanding Climate Change: Greenhouse gases, Anthropogenic causes, Carbon Cycle, Global Warming, Inventory of GHGs, Urban Heat Islands
- International and National Efforts: United Nations Framework Convention on Climate Change (UNFCCC), Conference of Parties, Kyoto Protocol, Intergovernmental Panel on Climate Change (IPCC), National Communication Process, Indian Network of Climate Change Assessment, Global Environment Facility (GEF), Clean Development Mechanism (CDM)
- Role of Human Settlements: Contribution to GHGs, Sectoral Contributions, Mitigation Possibilities, Low Carbon Settlements
- Impacts of Climate Change: Climate as forcing Variable, Locational Attributes, Sensitivity and Vulnerability of Different Sectors, Extreme Events and their Effects
- Adaptation Strategies: Resilience, Threshold Variables, Risk Avoidance, Risk Mitigation, Risk Coverage, Mitigation and Adaptation Linkage, Case Studies of Adaptation Approaches
- Climate Change – Implications for India's Water Resources: Impact of Global Warming on India's Climate, Impact of Global Warming on Floods and Droughts, Impact of Floods and Droughts on Human Society and Development, Potential of Surface Water Sources, Ground Water Potentials, Potential of the Monsoons to Supplement Water Supply, Future Demand and Supply of Water, Long-Term Water Supply Prospects, Coping with Climate Change and Adaptation
- Climate Change – Settlements: An introduction to the Earth's Climate System and Climatic Zones as Basis for Human Activity and Settlements, The Development of Society in Relation to the Local Climatic and Topographic Conditions, Resources Availability (Food, Building Material, Energy), Technical Skills and the Societal Framework, The Conditions for Development, Evolution and Collapse of Civilizations. An Assessment of Population Development and its Implications on Settlements, Buildings and Resource Consumption with Particular Focus on Energy Consumption

Suggested Readings:

1. Climate Change – Causes, Effects and Solutions, Hardy T John, Wiley
2. Climate Change – Observed Impacts on Planet Earth, Letcher M Trevor ed., Elsevier
3. Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group-II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M. Parry, O. Canziani, J. Palutikof, P. van der Linden and C. Hanson, Cambridge University Press

4. Climate Change and Water Resources in South Asia, Mirza Qader, Monirul M. and Q.K. Ahmad
5. Climate Change: Global Risks, Challenges and Decisions, Katherine Richardson, Will Steffen and Diana Liverman, Cambridge
6. The Melting Himalayas: Regional Challenges and Local Impacts of Climate Change on Mountain Ecosystems and Livelihoods, Xu J., Shrestha A.B., Vaidya R., Eriksson M. and Hewitt K., Kathmandu: International Centre for Integrated Mountain Development (ICIMOD)

MPEP0306: Waste Management

Course Objective:

The technical complexity and economic importance of Waste Management will increase dramatically in coming years. Waste disposal is now one of the major concerns of government, environmental bodies, local authorities and industry, and there is a pressing urgency for society to reduce its waste and for experts to find solutions for managing the growing environmental problems. Inappropriate management of wastewater has serious consequences for the environment, human health and economy. The main objective of this course is to enlighten students on the essential principles involved in the management of waste (household, industrial etc.) in a manner that meets public health and environmental concerns as well as the public's desire to reuse and recycle waste.

Course Contents:

Technological as well as non-technological aspects of waste management are included in this course.

- Introduction to Waste Management, Problems and Issues of Urban and Industrial Waste Management
- Introduction to Municipal Solid Waste Management; Basics of MSW System (Waste Generation, Collection, Storage, Transport, Disposal Aspects and Waste Processing Techniques); MSW Management System Design Considerations (Design, Cost Estimates and Implementation); Waste Reduction and Recovery Techniques
- Management and Treatment of Hazardous Waste; Integrated Waste Management
- Overview of Waste Water Situation, Domestic Waste Water Collection and Treatment: Design Approach (Waste Water Quality and Quantity Estimation, Layout and Design of Sewers, Sewer Appurtenances, Sump Well, Sewage Pumping); Waste Water Treatment Philosophy and Methods (Preliminary, Primary and Secondary Treatment of Waste); Design of Waste Water Treatment Plant; Cost Estimates and Financing Arrangements; Issues in Project Implementation; Residual Management
- Environmental Risk, Health and Safety of Facilities, Application of Treated Water
- Indian Experiences and Issues in City Effluent Treatment Plants

Suggested Readings:

1. Common Effluent Treatment Plants – State of Art : NEERI Publications
2. CPCB Guidelines for Bio-Technologies for Treatment of Wastes and Cleaner Technologies - Issue and Options
3. CPHEEO Manual
4. Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas, Research Study Series No. 88, CPHEEO, Ministry of Urban Development, Government of India
5. Understanding the Urban Poor's Vulnerabilities in Sanitation and Water Supply, Financing Shelter, Water and Sanitation, Evans B., Center for Sustainable Urban Development
6. Wastewater Treatment: Concepts and Design Approach, Karia G.L. and Christian R. A., Prentice Hall of India, New Delhi
7. Decentralized Waste Water Treatment in Developing Countries, Ludwig S., BORDA, Germany
8. Management of Solid Wastes, Phelps H.O., Heinke G. W., Jonker J.F., Ouano E.A.R. and Vandecasteele C., UNESCO, Paris

9. Wastewater Treatment Plants: Planning, Design, and Operation, Qasim S.R., CRC Press INC.
10. Integrated Solid Waste Management, Tchobanoglous G., Theisen H., and Samuel A Vigil, McGraw-Hill Inc., New Delhi
11. Solid Wastes-Engineering Principles and Management Issues, Tchobanoglous G., Theisen H., Eliassan R., McGraw-Hills Book Company, New York
12. Promotion of Solid Waste Recycling and Reuse in the Developing Countries of Asia- A Reference Handbook for Trainers, UNCHS, Kenya
13. International Source Book on Environmentally Sound Technologies for Municipal Solid Waste Management (6), UNEP, IETC, Osaka/Shiga
14. Design of Municipal Wastewater Treatment Plants, Water Environment Federation, McGraw-Hill, USA

MPEP0307: Thesis Programming

Course Objective:

To introduce students to literature review, research processes, techniques and colloquial arguments, so as to help them finalise a topic for their thesis in the subsequent semester. Two seminars would be conducted in the course of the semester to initiate the process of literature review related to their areas of interest culminating in selection of an appropriate thesis topic.

Course Contents:

- Identification of Topic of Interest having Relevance to Environmental Planning Profession, Integration and Application of the Learnt Research Processes to the Pre-Thesis Work
- Book Reviews and Journal Article Compilation to Establish the Body of Work Existing in the Selected Area of Work
- Collection of Data and Opinions by the Stakeholders, Decision Makers, Urban Managers, Advocates, Technocrats, User Groups, etc. on the Topic Selected
- Based on the Literature Review and Inputs from the Colloquial Arguments, the Topics shall be Finalised for Thesis in the Subsequent Semester
- Selection of Study Area, Identification of Extent and Spread of Intervention; Collection of Data for Preparation of Base Map
- Development of Research Thrust and Work Methodology. Identification of Data Sources
- Data Collection and Analysis: Sample Determination, Data Tabulation (Coding, De-Coding, Etc.), Quantitative and Qualitative Data Analysis. Appropriate and Relevant Data Analysis Methods Would Need to be Studied by Individual Students Based on Thesis Topic and Research Area
- Finalisation of Topic; Formulation of Problem Statement, Literature Review, Working Hypothesis, Research Brief, Research Methodology, Sample Determination, Data Collection and Analysis, Report Structuring

The student will be required to make two seminar presentations and submit a report at the end of the semester which will qualify as the literature review and research methodology component of his/her thesis in the forthcoming semester.

MPEP0308: Professional Training (Summer)

Course Objective:

To expose the students to the profession of planning and foster links with the industry so as to develop an understanding of professional nature of various organizations involved in the planning profession. The student is required to undertake summer training after 2 semesters of course work in any government, private or research organization undertaking environmental planning works. The practical training will commence during the summer break between second and third semester.

Course Contents:

- The Student is Expected to Work on any Project/s Related to Environmental Planning
- Individual Contribution of the Student in the Project Handled, in any of the Stages of Work Undertaken (Data Analyses, Project Formulation, Policy Framing etc.) is expected
- Each Student shall have to Undergo Professional Training for a Period of at least 6 Weeks in an Establishment Approved by the Class Coordinator and Professor In Charge
- A Student will be Required to Submit a Performance Report from the Planner under whom Training is Undertaken as well as a Detailed Report on the Work Carried out by him During the Training
- The Contents of the Report should Include Brief Introduction of Organization and Works Undertaken, Description of Project/s Worked on, Role of Individual Student Supported by Data/Evidences from the Organization.
- The Students would be Evaluated on the Basis of the Report Submitted and Presented as a Seminar at the Time of Viva-Voce and the Report Received from the Organization.

SECOND YEAR: FOURTH SEMESTER

MPEP0401: Thesis

Course Objective:

To develop independent critical thinking and design/research abilities and apply the knowledge gained, skills developed and professionalism inculcated over the last three semesters in an exercise of own interest and significant complexity.

Course Contents:

- The Thesis Project is to be undertaken independently by each Student on a Topic of his/her Choice related to Environmental Planning, Selected and Approved by the Faculty during the Previous Semester as part of Course Requirements of the Subject Thesis Programming
- As Part of the Studio Requirements, the Student is expected to go through a Process of Documentation, Analyses and Synthesis related to his/her Specific Topic and Related Area of Work
- Initial Stages would Include Study of Relevant Case Studies and Literature Relevant to the Topic, on the Basis of which the Space Program would be Determined
- Alternative Designs Arrived at through an Iterative Process of Prioritization and Elimination would be developed in the Next Stage
- Final Stages of Work would Include Detailed Design of the Best Option Selected. Detailing would be Largely Dependent on the Thrust and Focus of the Project Selected and Would Vary from Student To Student
- The Student is required to Work under the Guidance of a Supervisor Allotted by the Department and Complete the Requisite Work in the Course of the Semester, ending in a Viva-Voce Exam by a Panel of Examiners both External and Internal
- Progressive Evaluation would be done by a Panel of External and/or Internal Jurors during Reviews Held at Intervals during the Course of the Semester
- The Student is required to defend his Thesis through Drawings, Reports, Study Sheets, Models and Digital Presentations and Verbal Communications in all the Reviews and the Final Viva-Voce

MPEP0402A (Elective-II): Urban Forestry and Landscape

Course Objective:

The course introduces students to the art and general principles of designing, modifying and beautifying natural landscapes using indigenous and exotic plants thereby equipping students with skills in designing, planning and managing green spaces and natural landscapes in urban areas. This course sensitizes students with the importance of urban forestry and landscape design in planning and development of urban areas along with providing students with knowledge on the types and management of plants appropriate for urban forestry.

Course Contents:

- Introduction to Urban Forestry and Role of Trees in Urban Landscapes
- Urban Landscapes and Forest Establishment
- The Planting Stock for Urban Forest Establishment
- Planting on Pavements and Landscape
- Managing Established Urban Trees/Shrubs
- Urban Green Space and Urban Forest Management Plans
- Recreation Planning, Management and Landscape
- Selecting Plants for Landscaping, Creating and Maintaining a Natural Landscape
- Design and Management of Urban Recreation Parks
- Establishment and Management of Trees in the Landscape

Suggested Readings:

1. Journal on Urban Forestry and Urban Greening, Elsevier publication
2. Urban Forests and Trees: A Reference Book, Cecil C. Konijnendijk, Kjell Nilsson, Thomas B. Randrup, Jasper Schipperijn
3. Forestry Serving Urbanised Societies, Konijnendijk C.C. and Hoyer K.K., IUFRO European Regional Conference in collaboration with EFI, Copenhagen, Urban Forestry & Urban Greening Supplement 2002
4. The Restorative Environment: Nature and Human, Kaplan S.
5. The Role of Horticulture in Human Well-Being and Social Development, Portland O.R., Timber Press
6. Planning Concerns Relating to Urban Nature Settings: the Role of Size and Other Physical Features, Talbot J. F. in J.L. Nasar (ed.) Environmental Aesthetics: Theory, Research and Applications, Cambridge University Press

MPEP0402B (Elective-II): Poverty and Environment**Course Objective:**

Environmental degradation and poverty alleviation are important global issues that have a lot in common, but are often treated separately. This course explores the linkages between environment and poverty and examines various options to deal with the issues.

The objective of the course on Poverty and Environment is to sensitize the students about Environmental issues arising out of poverty that are affecting urban settlements across the country. The primary aim of the course is to train the students to analyse the linkage objectively enabling them to make informed choices when they encounter such issues.

Course Contents:

- Poverty and environment: Characterizing Poverty; Defining Environment; Links between Environment and Poverty; Global Environmental Issues and Poverty
- Environmental Concerns in Informal Sector: Quality of Life in Informal Sector; Level of Basic Physical Infrastructural Services; Pollution of Existing Services; Socio-Economic Deprivation and Environmental Degradation
- Environmental Agreements and Poverty: Multilateral Environmental Agreements like Convention on Biological Diversity, Convention to Combat Desertification and the Framework Convention on Climate Change to learn Mechanisms to Protect the Environment to Reduce Poverty.
- Poverty and Ecosystems: Assessment of Essential Ecosystem-Poverty Links
- Programmes and Policies: Urban Poverty Alleviation Programmes; Impact of Macro-Economic Structural Adjustment Policies on Poor Urban Households; Planning Legislation and the Urban Poor; Shelter Services and Management for the Urban Poor; Policy Implications
- Regulatory Framework: Policies for Assistance and Implications for Promotion; Appropriate Regulatory Control for Environmental Improvement; Flexibility in Byelaws and Organization through Self-Help and Community Development
- Participatory Techniques and Capabilities: Appraisal of the Role of Government, Private and Voluntary Organizations; Existing Management and their Organizational Set-Up and Limitations
- Vulnerability and Adaptation: Policies Promoting Local Resilience and Adaptive Management to Reduce Vulnerability; Disaster Resilience; Adaptation as Resilience Building

Suggested Readings:

1. Poor Economics, Abhijit V. Banerjee et al, Vintage Books
2. Poverty and Famine, Amartya Sen, Oxford University Press
3. Measurement of Poverty, Dandekar V.M., Orient Blackswan
4. The Role of Environment in Poverty Alleviation, Galizzi P.(edt.), Fordham University Press
5. Poverty and the Environment: Understanding Linkages at the Household Level, The World Bank Report

6. An Introduction to Global Environmental Issues, Pickering K.T. , L.A. Owen, Routledge, Taylor & Francis Group
7. Poverty, Inequality and Population: Essays in Development and Applied Measurement, Jayaraj D. et al , Oxford University Press
8. Poverty and Deprivations in Urban India, Sabir Ali, Bookwell
9. Poverty in India – Concepts, Measurement and Alleviation, Shree Publishers
10. Informal Sector in India – Challenges and Consequences, Bhosale B.V., Lap Lambert Academic Publishing
11. Urban Informal Sector in a Developing Economy, Papola T.S., Vikas Publishing House
12. Slums in India, Mohanty L.N.P., Aph Publishers
13. India Urban Poverty Report, UNDP, Ministry of Housing and Urban Poverty Alleviation, Government of India
14. Managing Urban Poverty, Sabir Ali, Uppal Publishing House

MPEP0402C (Elective-II): Environment and Society

Course Objective:

Objective of this course is to provide basic understanding of the relationship between environment and society. The focus is on how community participation can be achieved in conservation of environment and development initiatives. Students will be familiarized with behavioural responses of society towards built and natural environment, resolving conflicts between man and environment and health related issues.

Course Contents:

- Community Participation in Environment Conservation: Participatory Concepts, Principles, Tools, and Processes that have Practical Application to a Broad Range of Contexts and Settings
- Behaviour and the Urban Environment: Collective and Individual Responses of People towards Built and Natural Environment. Methods to Use These Responses to Guide Projects, Plans and Policies. Learning of Behaviour Pattern through Case Studies
- Mediating Environmental Conflicts: Approaches to Mediation, About Conflicts, Social Principles of Sustainability, Human Equation
- Resolving Environmental Conflicts: Practicing Mediation of Conscience, Resolution, Modifying our Beliefs Systems Regarding Change
- Environment And Human Health: Introduction to Environmental Health, Mobilizing for Community Health and Understanding Causes of Environmental Health Problems, Environmental Rights and Justice, Case Studies of Environmental Policies to Protect Human Health
- Introduction to Environmental Ethics: Historical overview; The Axiology of Environmental Ethics (Anthropocentrism, Sentientism and Ecologism); Cultural Significance of Environmental Ethics; Environmental Justice and Equity; Human Rights in relation to Environment; Role of Non-Governmental Organizations (NGOs) in Environmental Protection
- Environmental Policy Advocacy: Introduction to Environmental Policy Advocacy Concept and Issues; Advocacy Methods for Outlining and Finalizing Strategy and Framing of Plan for Advocacy; Implementation of Advocacy Initiative
- Environmental Migration: Introduction to Environmental Migrants; Need to Regulate Environmental Migration; International Refugee Law; International Human Rights Law; International Environmental Law; International Humanitarian Law; Environmental Migration Governance

Suggested readings:

1. Environment and Justice, Jariwala, C.M., A.P.H. Publishing
2. Environment of human settlements: human wellbeing in cities, Proceedings of the conference held in Belgium – Brussels, Laconte, P. & others, Pergamon Press
3. Making Sense of Intractable Environmental Conflicts: Concepts and Cases, Lewicki R., Gray B. and Elliott M. ,(ed.), Island Press

4. Mediating Environmental Conflicts: Theory and Practice, Blackburn J.W. and Bruce W. M., Quorum Books
5. Resolving Environmental Conflicts, Maser C. and Pollio C.A., Taylor and Francis
6. The Energy & Resources Institute, Environmental Threats, vulnerability & adaptation: case studies from India, TERI press, 2004, New Delhi
7. Environmental Migration Governance, Jane McAdam, Faculty of Law , University of New South Wales
8. Environmental Ethics: The Big Questions, Keller D.R., et al., Wiley- Blackwell

MPEP0403: Seminar on Contemporary Environmental Issues

Course Objective:

Students have to undertake work on contemporary topics of relevance to the environmental planning profession. Students would be encouraged to select topics of relevance in contemporary context and undertake research on past initiatives and future possibilities in the area. The work would include literature review of previous initiatives in the area of research, tools and techniques developed, survey of stake holders' and expert opinions and reporting of findings in a technical report format.

Course Contents:

- Identification of Topic of Interest having Relevance to Planning Profession
- Book Reviews and Journal Article Reviews To Establish The Body Of Work Existing in the Selected Area of Work
- Exposure to Multiple View Points and Colloquial Arguments by the Stakeholders, Decision Makers, Urban Managers, Advocates, Technocrats, User Groups, etc. on the same Topic
- Identification of Key Issues Related to the Area of Work
- Development of Future Possibilities and Scenarios to Enrich the Existing Body of Work

The student will be required to make three seminar presentations and submit a report at the end of the semester

MPEP0404: General Proficiency

Course Objective:

The emphasis will be on grooming the students into well-rounded individuals who are fully aware and sensitized towards their responsibilities and local environ/conditions. The students will have to move beyond academics and actively engage themselves into various other activities so that they evolve as mature and confident professionals.

Course Contents:

A viva-voce would be conducted at the end of the semester, in which a candidate is required to furnish particulars of his other achievements, outside academics along with relevant support documents. The students will receive credits for their participation into extracurricular activities covering the following areas:

- At the Post Graduate level of education, a student is required to participate in seminars, workshops, paper publications and other events outside the core curriculum to enhance ties with the profession.
- Community services: On an individual basis or as a group activity.
- Physical fitness: This can be achieved either through competitive sports and/or activities like yoga etc. The students will have to conclusively demonstrate their endeavours towards this goal.
- Personality development: Activities where the student emerges as a great team member, focus on development of excellent communication skills (verbal and written), ability to

lead a team towards a goal, positivity in approach and attitude , ability to withstand and work under pressure with stiff timelines

- Pursuit of creative art viz, either of fine arts or performing arts. This may include workshops on dance, drama, painting, sketching, art appreciation and creative writing; performance-based creativity like theater, music, and dance, etc.