

विश्वेश्वरय्या राष्ट्रीय प्रौद्योगिकी संस्थान, नागपूर

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR



Course Book
M.Tech. (Urban Planning)

2015-2016





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Courses to Register in First Year

I Semester			
Code	Course	L-T-P	Credits
ARL507	Planning Principles and Techniques (DC)	3-0-0	3
ARL508	Housing (DC)	3-0-0	3
ARL436	History of Human Settlements (DE)	3-0-0	3
ARL438	Urban Landscape (DE)	3-0-0	3
ARL512	Urban Design and Conservation (DE)	3-0-0	3
ARP501	Planning Studio- I (DC)	0-0-8	4
MAL502	Statistical Methods for Urban Planning (DC)	3-0-0	3
		Total Credits	16
II Semester			
Code	Course	L-T-P	Credits
ARL509	Transportation Planning (DC)	3-0-0	3
ARL510	Infrastructure Planning (DC)	3-0-0	3
ARL451	Urban Climatology (DE)	3-0-0	3
ARL513	Disaster Management (DE)	3-0-0	3
ARL520	RS & GIS Applications (DE)	2-0-2	3
ARL515	Planning Legislation & Urban Management (DE)	3-0-0	3
ARL452	Urban Sociology (DE)	3-0-0	3
ARL517	Planning for Informal Sector (DE)	3-0-0	3
ARL511	Ecology & Environmental Planning (DE)	3-0-0	3
ARL516	Sustainable Development (DE)	3-0-0	3
ARL514	Planning for Rural Development (DE)	3-0-0	3
ARP502	Planning Studio- II (DC)	0-0-6	3
ART503	Project Appraisal/ Training (DC)	0-0-0	0
		Total Credits	18



Courses to Register in Second Year

I Semester			
Code	Course	L-T-P	Credits
ARL518	Urbanisation and Climate Change (DE)	3-0-0	3
ARL519	Metro and Regional Planning (DE)	3-0-0	3
ARL453	Urban Economics (DE)	3-0-0	3
ARL439	Project Formulation and Appraisal (DE)	3-0-0	3
ARP504	Planning Studio- III (DC)	0-0-6	3
ARD505	Project Phase- I (DC)	---	3
		Total Credits	09
II Semester			
Code	Course	L-T-P	Credits
ARD506	Project Phase- II (DC)	---	9
		Total Credits	09
	Total Credits (All Semesters)		52

NOTES:

- All studios shall involve a field visit for about ten days duration to selected area/ city/ region for survey and documentation purpose.
 - Evaluation of studios would be done on continuous basis with final external review
 - ART 503 (Project appraisal/ Training) to be taken up during summer vacation and evaluation would be done through external viva-voce examination
 - Completion of minimum 25 credits up to Second semester and pass in Planning Studio - I and Planning Studio - II is prerequisite for registration to Third semester courses.
 - Completion of all credit requirements up to Third semester is prerequisite for registration to Project Phase- II (Thesis) in Fourth semester.
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Details of Course Contents

ARL507: PLANNING PRINCIPLES AND TECHNIQUES **3-0-0 Cr. -3**

Objectives: The objectives of the course are to introduce students to various techniques for generating and analyzing data and making its interpretations. It introduces the conventional planning tools for design and development of urban areas.

Contents:

1. Introduction to versions planning principles and techniques used since the historic times.
2. Processes and methods for survey and research, Methodology of conducting surveys and presenting survey data.
3. Basic quantitative methods in collecting analysis, projecting and presenting data on various land uses.
4. Standards for development and redevelopment. Study of spatial standards, performance, physical standards etc.
5. Problems of urban renewal, study of various techniques for central area development and residential area units.
6. Techniques and tools for development control, land values and density pattern.
7. Introduction to aerial photography, photo-interpretation and remote sensing, photo-interpretation techniques.
8. Brief study of urban areas preferably with Indian context.

Tutorials: Notes, tests, seminars etc.

Reference Books:

Lewis Kibel: Principles and Practice of Town and Country Planning
ITPI Reading Material on Planning Techniques
Levy: Contemporary Urban Planning (fourth Edition)
N.V.Modak & V.N. Ambedkar: Town and Country Planning and housing

ARL508: HOUSING **3-0-0 Cr. -3**

Objectives: The objective of this course is to introduce students to various dimensions of housing, its provision mechanisms and role in urban, regional and national development.

Contents:

1. Housing through ages in urban and rural areas with locational factors.
2. Importance of housing in urban and regional development.



3. Urbanization and problem of housing, slum and squatter settlements, problems and possibilities.
4. Need, demand and supply of housing in urban and rural areas.
5. Comparative study of various housing policies and programmes.
6. Evolution of physical standards for housing designs with reference to socio-economic factors, Density standards and community planning considerations in residential layouts.
7. Structural concepts, use of traditional and new building materials and methods, self- help and low cost housing.
8. Role of co-operative and public and private agencies.

Tutorials: Notes, tests, seminars etc.

Reference Books:

Goethert, Reinhard, Tools for the Basic Design and Evaluation of Physical Components in New Urban Settlements.

Das, S. K., Urban Coherence and Housing Strategies Design Ideas in Practice in India.

Methods of Estimating Housing Needs, United Nations No. 67 XVII 15.

ARL436: HISTORY OF HUMAN SETTLEMENT

3-0-0 Cr. -3

Objectives: The course is intended to give insight into the practice of settlement planning, its emergence over time in India and abroad. Further it is intended to introduce the contemporary theories and practice of settlement planning.

Content:

1. Factors influencing the growth of Human settlement, Aims and objectives of physical planning
2. Development of planning thought from ancient times through Medieval and renaissance periods.
3. The New Town Movement; Industrial revolution and environmental crisis, Impact of urbanization and industrialization.
4. Contributions of Ebenezer Howard, Patrick Geddes, Le Corbusier, Sir Abercrombie and others to planning thought.
5. Planning concepts in India, Ancient, pre-independence and post- independence development.
6. Levels of planning in India and their inter-relationships, Development Plan, Types, Scope and objectives.
7. Physical nature and characteristics of the urban environment and its components.
8. Land uses – Physical structure and relationship of parts of a city.

Tutorials: Notes, tests, seminars etc.



Reference Books:

Lewis Mumford: City in History
Sybel Maholy Nagy: Matrix of Man
G.P.Singh: Republics, Kingdoms, Towns and Cities in Ancient India
A E J Morris: History of Urban Form.
Edmund Bacon: Design of Cities.

ARL438: URBAN LANDSCAPE

3-0-0 Cr. -3

Objectives: The objective of this course is to introduce the fundamentals of landscape planning in urban areas and deliberate on approaches towards dealing with green and un-built spaces in urban environments.

Contents:

1. Introduction: Man and his surroundings, coordination between architecture, town planning and landscape planning, Organisation of spaces, role of plants, water and landforms, etc.
2. Theories and principles of landscape planning: past and present theories and principles, role of landscape design at various levels, global scenario, etc.
3. Relevance and considerations for urban landscape: social, cultural, ecological, functional, aesthetical, economical, recreational, health and environmental considerations at different levels and with reference to different land uses like residential, commercial, mixed, industrial, etc. Study of landscape design-particular emphasis to India and its contribution
4. Application areas for urban landscape: Recreational areas like urban parks, open spaces, playfields, waterfront developments, parking plazas; Case studies with reference to aspects mentioned above

Tutorials: Notes, seminars, plates & case studies, site visits etc.

Reference Books:

R Gene Brook: Site planning, environment, process and development
Kevin Lynch: Site Planning
Michael Laurie: An introduction to landscape architecture
Tom Turner: Landscape Planning
Brian Hackett: Landscape Planning: An Introduction to Theory and Practice

ARL512: URBAN DESIGN AND CONSERVATION

3-0-0 Cr. -3

Objectives: To provide insight into urban design and urban heritage, entailing urban heritage as potential resource to increase economic opportunities, city livability, and competitiveness with specific emphasis on Indian context.



Contents:

1. Definition of urban design, Scope of urban design in Indian context, integration with urban planning
2. Historical development and approach to urban design, spatial design, classical, function, ornamental space order
3. Elements of Urban Design; Urban form aesthetics, visual order of forms, sequence, space, scale.
4. Urban structure and design rationale; Interrelationship between economic activities, public organizations, communication systems; Landuse structure and urban community life.
5. Conservation and urban renewal: Conflicts and compatibility, changing values, obsolescence, land blight.
6. Concepts of urban decay, approaches and strategies for urban regeneration, urban redevelopment and requirements and costs; Physical restoration, causes of physical deterioration, selection of construction methods, Materials specification.
7. Problems of conservation in developing countries, Conflict resolution between development and preservation
8. Role of community in Conservation: Regulation, legislative and revenue aspects.

Tutorials: Notes, seminars, plates & case studies, site visits etc.

Reference Books:

Edmond Beckons: Design of cities

Rob Krier : Urban space

Kevin Lynch : Image of City

Geoffery Broadbent : Emerging Concepts in Urban Space Design

ARP501: PLANNING STUDIO –I

0-0-8 Cr. -8

Objectives: The objective of the course is to enable students explore and understand characteristics of urban areas and various issues thereof. It introduces the planning and design approach for a residential neighborhood.

Contents:

Perception Studies and area appraisal; Area Planning; preparation of at least one planning scheme at Zonal (residential/ commercial and industrial area) level; Undertaking physical/socio-economic survey; Presenting survey data/maps, etc.



Expected Outcomes & Assignment

- Study of a neighbourhood involving location, salient features, spatial characteristics, facilities and amenities, road circulation patterns, spatial and non-spatial linkages to surrounding areas. Comparison with standards, building byelaws etc.
- Concept design for a given area. } Design brief, drawings,
- Design of a neighbourhood unit } analytical charts etc.

MAL502: STATISTICAL METHODS FOR URBAN PLANNING 3-0-0 Cr. -3

Objectives: The course intends to introduce students to various statistical methods significant in analysis of various urban components.

Content:

1. Introduction, scope and methods of statistics, frequency distribution, measures of location, dispersion and skewness.
2. Correlation & regression analysis, least square method – curve fitting
3. Theory of probability: random variables, some probability distributions – Binomial, Poisson, and Normal.
4. Sampling Theory: Population Parameter, Sample Statistics, Sampling distributions, Sample mean, Sampling distribution of means, the sample variance, the sampling distribution of variance.
5. Estimation Theory: Point estimate and interval estimates, reliability, confidence interval estimates of population parameters, confidence intervals for means, proportions and variance.
6. Tests of Hypothesis and Significance: Statistical decisions, tests of hypotheses and significance, Type I and Type II errors, level of significance, one tailed and two tailed tests. Tests involving small samples and large samples, fitting theoretical distributions to sample frequency distribution, The chi-square test for goodness of fit.

Tutorials: Notes, tests, exercises on above topics etc.

Reference Books:

- S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics, Khanna Publishers, New Delhi, 1989.
- M.R. Spiegel: Probability and Statistics, McGraw-Hill, 1995.
- Vijay K. Rohatgi & A.K. Md. Ehsanes Saleh: An Introduction to Probability and statistics , John Wiley & Sons Inc., New York, 1976.
- Kishor S. Trivedi : Probability & Statistics with reliability, Queuing and computer Science applications, PHI private Ltd, 2009.



ARL509: TRANSPORTATION PLANNING

3-0-0 Cr. -3

Objectives: The course introduces various key aspects of urban transportation systems, emerging issues and their planning approaches.

Contents:

1. Relation between local, regional and national levels of transportation planning.
2. Study of transportation systems such as – Roads, Railways, Waterways and Airways.
3. Relationship between traffic and landuse, study of traffic movements and characteristics, transportation surveys, means and methods.
4. Hierarchy of roads and road geometrics, Norms and guidelines for highway landscape; street furniture and lighting types, standards and design considerations.
5. Mass transportation system in major cities; Technological options, Integrated System Plan Concept, System selection, Pricing & Financing of Public Transport Service
6. Transportation surveys and their types, sampling methods, survey techniques; Designing O-D & other Traffic & Transportation surveys, programming and processing of travel data, analysis and interpretation of traffic studies.
7. Causes and consequences of traffic generated noise and air pollution, noise abatement measures, Air pollution standards, energy and environmental implications of transportation systems.
8. Review of national, state and local level transport policies and their relevance in spatial and economic planning.

Tutorials: Notes, seminars, on field sample survey etc.

Reference Books:

Khanna & Justo: Highway Engineering
L.R. Kadiyali : Traffic and Transportatin Planning
Vazirani and Chandola Transportation Engineering ,New Delhi.
Road Development Plan of India 2021 – Indian Road Congress

ARL510: INFRASTRUCTURE PLANNING

3-0-0 Cr. -3

Objectives:

The course introduces basic urban infrastructure systems and their key components. It highlights upon the issues and planning concerns at various stages of service delivery.



Contents:

1. Introduction, types of infrastructures; Considerations for infrastructure provisions such as demography and environmental settings; Infrastructures and regional development
2. Studies in municipal services for water supply, drainage, sewage and sullage disposal, refuse removal, street lighting and numbering.
3. Water supply: Surface and ground water sources, water requirement for different land uses, factors affecting water demand, Components of water distribution and storage systems, flood frequencies, flood protection measures in urban areas.
4. Solid waste management; types of wastes, quantum of waste generated from various landuses, collection and transportation, disposal of solid waste; different methods of solid waste disposal systems; Community participation and NGO's, involvement in efficient and solid waste management, study of best practices.
5. Sewerage and Drainage: Methods of sanitations, advantages of limitations; network and layout, Sewage disposal methods and location criteria.
6. Telecommunication, cable T.V., Wireless communications, digital communications - Internet and intra-net,
7. Energy and power supply networks, Conventional and non-conventional energy forms, some emerging trends
8. Financing aspects of infrastructure provisions, PPP, Municipal Bonds etc.

Tutorials: Notes, tests, seminars, etc.

Reference Books:

Gurcharan singh: Water supply and Sanitary Engineering-, Standard Publishers, Distributors, New Delhi.

AK. Chaterjee: Water Supply, Waste Disposal and Environmental Poll. Engineering – Khanna publishers

G.S. Birdie: Water supply and Sanitary Engineering

ARL451: URBAN CLIMATOLOGY

3-0-0 Cr. -3

Objectives:The course aims at understanding urban climatology and its relevance to the design and planning of cities

Contents:

1. Introduction to urban climate, Urban effect on the atmosphere at all scales, Measuring different parameters like Airflow, Temperature and Humidity, Precipitation and Evaporation within the urban setting



2. History of urban climate studies and major developments in the field, brief outline of methodological and conceptual developments
3. Physical character of urban surface and its emissions of heat, Impact of urban land-use and land-cover on urban climate, Exchanges of energy at the surface of the earth and modification in the urban environment. Impact of materials and urban geometry on the natural energy fluxes and contribution of anthropogenic heat
4. Human thermal climate and the notion of (dis) comfort. Introduction to different models used for climatological and meteorological purposes.
5. Possible response of built environment at different urban scales to address to the climate stresses

Tutorial: Case study, report, etc.

Reference Books:

Helmut E. Landsberg: The Urban Climate

M. Rohinton Emmanuel: An Urban Approach to Climate-sensitive Design: Strategies for the Tropics

P.O. Franger: Thermal Comfort: Analysis and applications in environmental engineering

Oke T.R.: Boundary Layer Climates

ARL513: DISASTER MANAGEMENT

3-0-0 Cr. -3

Objectives: The objective of the course is to apprise students of various disasters affecting human settlements and their impacts. It provides an insight into the planning approaches for dealing with adversities at different scales and discusses issues involved

Contents:

1. Disaster - concepts, processes and perceptions - natural and man-made - cause and consequences.
2. Disaster and natural environment, floods and drainage - soil erosion and landslides - earthquakes, land and building hazards.
3. Disaster and man-made environment - industrial pollution and health hazards - natural resources damage - social unrest and damage to people and property.
4. Disaster Management Plans- structure and process, elements of comprehensive disaster management (Preparedness, Response, Recovery and Mitigation), phases for plan making (pre-disaster, during and post-disaster), the technological regime- standards for urban development and building construction.
5. Measures for mitigation and rehabilitation, damage assessment- some issues.
6. Disaster education - community awareness and action - NGO role and management after disaster, people's participation and self-help measures of mitigation.



7. Problems of financing and insurance, Role of the Civil Defense during disasters. Case studies – prevention and corrective measure implemented to face natural disasters.
8. National policies, objectives & standards government structures for warning and Emergency Response; Other external and national assistance organizations.

Tutorials: Notes, seminars, short exercise on plan preparation etc.

Reference Books:

B K Prasad : Sustainable Rural Development for disaster mitigation

ARL520- RS AND GIS APPLICATIONS

2-0-2 Cr. -3

Objectives: To take an overview of RS and GIS applications in various planning processes.

Content:

1. Introduction to photogrammetry: Fundamentals of Aerial Photography: History of AP; Types of Aerial Photography; Methods of Calculating the Scale of A.P.
2. Basic Concepts in Remote Sensing: Concepts; Remote Sensing System; Electromagnetic Spectrum
3. Geographic information Systems: Introduction to GIS; Spatial Data Representation; Data & Coverage; Functions of GIS; GIS as a Decision Support System; issues related to applications, GIS applications design and implementation.
4. Integration of GIS and Remote Sensing: Measuring locations, distances, Map scale; Mapping principles.
5. Applications of GIS : Generation of map outputs from GIS- elements of cartographic maps, making cartographic map layouts in GIS
6. Data representation and analysis softwares: Introduction to use of softwares like ArcGIS, ENVI, SPSS, Minitab, etc for data representation, data tabulations, assigning attributes, analysis and types of output.

Tutorials: Tests,tutorials,assignments based on applications of data representation and analysis softwares for various planning processes

Reference Books:

Roger Tomlinson: Thinking about GIS; Stephen Wise: GIS Basics
Tor Bernhardsen: Geographic Information Systems (An Introduction)
Keith C. Clarke: Getting Started with Geographic Information Systems
Floyd F. Sabins: Remote Sensing Principles and Interpretation
Stephen Wise: GIS Basics



ARL515: PLANNING LEGISLATION AND URBAN MANAGEMENT 3-0-0 Cr. -3

Objectives: To make the students aware and improve their understanding regarding

- The significance of planning legislation in the overall planning process for rural and urban areas with reference some relevant Acts.
- The significance of urban management in the overall planning process, the related acts and provisions for the same at various levels
- The Professional role and responsibility of planning consultants

Contents:

1. Introduction to Indian Constitution; Eminent domain, Police power and taxation powers as basis of legislation.
2. Meaning, significance and objective of planning legislation; constitutional basis and provisions of relating to land, its development and use.
3. Development of planning legislation in India, salient features with a few selected state Town and Country Planning acts, land acquisition act, Urban land ceiling act and other urban policy implication for public action.
4. Conservation of natural resources including mining and forestry acts, Institutional framework for environment planning and resource management, environmental legislation and administration.
5. Development plan and area planning legislation, Development controls, zoning regulations, bye-laws and their implication to urban growth.
6. Form, function and powers of Municipal corporations, Municipalities, Notified area authorities, Cantonment boards etc.
7. Administrative and functional structure of Implementing Authorities, Special Area Development Authorities, Professional Institutes; Professional role and responsibility of planning consultants, professional ethics and code of conduct
8. Rural and urban local self government, state – local relationship, Panchayat Raj, Panchayat Samities and Zilla Parishad

Tutorials: Notes, tests, seminars, etc.

Reference Books:

ITPI Reader Volume, UDPFI Guidelines
Acts related to the course content
Master Plan Approach: Efficacy & Alternatives



ARL452: URBAN SOCIOLOGY

3-0-0 Cr. -3

Objectives: The course introduces some of the key ideologies in urban sociology and highlights on the growth and development of urban areas from socio-cultural perspectives specifically in Indian context.

Content:

1. Definition and scope of sociology; relationship between sociology and town planning; Introduction to the sociological thoughts of Marx, Talcot Parsons, Jane Jacobs etc.
2. Rural – urban continuum, dichotomy; Physical and Social setting; peasant society and industrial society– production system and production relation, relation between village and town today.
3. Indian village community, rural settlement spatial and social aspects.
4. Urban sociology with respect to Indian cities; Urbanisation in India, urbanization process as influenced by socio-cultural, political, economic and administrative factors
5. Trends and characteristics growth of the modern city and the metropolis; migration, population growth and its impact (social and physical) policies or urban development.
6. Urban social structure and stratification dynamics of growth and change; Dynamics of rural society;
7. Perspectives on Urban Culture, urban culture and post modernity; Neighborhood Concept- Implications and limitations in Indian context.
8. Institution, leadership, changing power structure with special reference to Panchayati Raj system.

Tutorials: Notes, tests, seminars etc.

Reference Books:

K.Motwani, R.D. Saksena: Encyclopedia of Sociology of Politics
Ahuja: Social problems in India (Second Edition)

ARL517: PLANNING FOR INFORMAL SECTOR

3-0-0 Cr. -3

Objectives:

The course is intended to give insight into the Informal sector as a major and important component of urban areas. Further course is intended to explore the various ways in which informal sector physically manifests itself in the urban area, the issues arising therefore, and various approaches in addressing the same.



Content:

1. Economic perspectives in understanding the urban processes and their outcome manifested in urban poverty, migration, rapid urbanization, growth of low-income settlements
2. Views examining the non-economic factors determining urban change, marginality and marginalization.
3. Growth and characteristics of the informal sector, Formal - informal sector linkages and their effect on urban development
4. Urban poverty: dimensions, determinants and spatial poverty traps, government programmes, effectiveness of anti-poverty programmes in space, replicability of urban anti-poverty programmes.
5. Regulatory and facilitative policies on the access of poor to infrastructure, land and labor markets.
6. Type and characteristics of informal settlements - their integration into mainstream planning - standards and their applicability to urban poor - case studies on organizing the poor for land development, micro finance, labour market, etc.

Tutorials: Notes, seminars, etc.

Reference Books:

Penelope J. Brooke: Infrastructure for poor people – Public policy for private Participation
M.S. Ramanujam Employment promotion on the Urban Informal Sector - New age international publishers
Satish Tiwari: Urban Development , Anmol Publications, New Delhi
Amitabh Kundu: On the name of Urban poor – Access to Basic Amenities, Sage Publications.

ARL511: ECOLOGY & ENVIRONMENTAL PLANNING 3-0-0 Cr. -3

Objectives: The course introduces basic principles in ecological sciences and their relevance to urban studies. It intends to develop an understanding of natural processes and their significance in shaping various urban environments. The course provides an outline of planning approaches and methods

Contents:

1. Fundamentals of ecology, ecosystem structure and function; Fundamental ecological principles pertaining to planning and resources use.
2. Human settlement as ecosystem – a board ecological perspective; Introduction to Urban Ecology.
3. Concept and principles of sustainability; Use, development and management of resources.



4. Concept and definitions of Biodiversity, Bio-geographical classification of India, Issues in Biodiversity management; Significance of Urban Biodiversity in planning process, JFM & biodiversity conservation in tribal areas; Biodiversity Convention, Biodiversity Act etc.
5. Environmental pollution, types, effects, sources and amelioration with particular reference to physical planning and design measures.
6. Urban development and environmental disruptions, Introduction to EIA, methods and techniques, related issues.
7. Environmental planning in special geo-climatic regions; Hill area developments, Coastal and Arid regions.
8. Introduction to theory of Environmental Design.

Tutorials: Notes, seminars, site visits etc.

Reference Books:

Sandhu. Mihan : sustainable Human Settlement the Asian Experience
RK Pachmi : The Message from WSSD

ARL516: SUSTAINABLE DEVELOPMENT

3-0-0 Cr. -3

Objectives: This course provides an overview of the design and planning of built environment for sustainable development. It enables students to acquire skills needed to analyze sustainability issues and further guides to develop a framework for conceptualizing which measures and strategies are sensible to address sustainability at different level from building to global level.

Content:

1. Sustainable Development Introduction, Origin, Definition, Three pillars of Sustainable Development, Transformation from piecemeal to linked approach, Key Principles, Resource Conservation, Critiques on Sustainable Development
2. Sustainable Urban Development: Integrating the Dimensions of Sustainability: Socio- cultural Aspects, Economic Aspects, Environmental and Land Use Aspects, Technological Aspects, Role of local knowledge systems in sustainable development
3. The Theory and Measurement of Sustainability: Ideologies and Ethos of Sustainability, Indicators, Indicator Framework for Assessing Sustainability, Traditional Vs Sustainability Indicators, Process: Concept to Application
4. Measurement Systems for Sustainable Urban Development: Concept Level (Broad) Measurement Systems, Advanced Measurement Systems Context (Application Specific) Measurement Systems, Other measurement systems



5. Economic and Environmental sustenance: Concepts of environmental economics, environmental accounting, resource pricing, green house emissions and implications on global trade
6. Public Policies and Programs for Sustainability: Policies at different levels like Global, National, Regional, City, District Neighbourhood, Cluster or Building, Best Management Practices for Sustainability
7. Sustainability in India: Need, Issues and Challenges, Urbanization in India, Sustainable Development in India, Sustainability Measurement and Rating Systems and Initiatives in India

Tutorials: Notes, tests, seminars, etc.

Reference Books:

Environment, Growth, and Development: the Concepts and Strategies of Sustainability, Bartelmus, Peter, London: Routledge, 1994
Guide to Sustainable Community Indicators, Hart, Maureen, North Andover, MA: Hart Environmental Data, Second Edition, 1999
Sustainable Planet: Solutions for the Twenty-first Century, Schor Juliet and Betsy Taylor , Boston: Beacon Press, 2002
Intelligent Urbanization-Roadmap for India, booz&co, CISCO, Confederation of Indian Industries.
Sustainable Development in India: Stocktaking in the run up to Rio+20. TERI, New Delhi: Ministry of Environment and Forests, Government of India, 2011
Sustainable Urban Development, Volume 3: The Toolkit For Assessment, R. Vreeker et al. New York and Oxon: Routledge, 2009

ARL514: PLANNING FOR RURAL DEVELOPMENT

3-0-0 Cr. -3

Objectives: The course intends to provide insights into the issues and concerns of rural areas specifically in the Indian context and introduce influencing factors and approaches for planning and development of rural regions.

Contents:

1. Rural Situation in India, Indian Village from the Pre-British Period to 1947, Social Stratification Changes and Modernisation
2. National Planning and rural development, Regional Development and urban rural partnerships, related inputs and infrastructure development.
3. Agricultural development allied activities, Agriculture under Five Year Plans, Marketable Surplus and Cropping Pattern. Patterns of rural linkages, communication and marketing facilities, community development, institutions and delivery of social services.
4. Rural settlements, typology, structure, Spatial significance in metro regions and interior areas. Area, district and block level development planning and implementations, public participation in rural development process, role of



voluntary organisations. Planning principles of village planning and community norms.

5. Rural energy issues, renewable and alternative sources of energy; Ecological and environmental considerations in rural development and village planning.
6. Land Reforms in India: Need and Scope of Reforms, Tenancy Reforms., Rural Credit.
7. Community Development and Panchayati Raj, Area Development and Target Group Based Development.
8. Non-Government Experimentation of Rural Development, Milk Co-operative in India.

Tutorials: Notes, seminars, etc.

Reference Books:

Ashok Kumar: New Approaches in Rural Development
D. Robins, W Tansly & K G Wills: Rural Resources Development

ARP502: PLANNING STUDIO – II

0-0-6 Cr. -3

Objectives: The objective of this studio is to expose the students to study of appropriate planning standards, techniques of population projection, Identification of the data to be collected and the sources thereof, organizing surveys, Using selected computer software to analyze the data, Projecting the future with different scenarios and identification of ‘action areas’ (i.e., specific problems related with housing, services, circulation, etc.)

Contents:

Planning problem will include case studies of small/medium towns and/or central metropolitan areas / business districts, composite commercial residential / industrial area development.

Expected Outcomes & Assignment

Preparation of development/ master plans for small/ medium settlements; Presenting survey / data / maps, feasibility, implementation reports.



ARL518: URBANISATION AND CLIMATE CHANGE

3-0-0 Cr. -3

Objectives: The course intends to expose students to the emerging concern of climate change and its predicted implications for urban planning. The course deliberates on various issues and approaches for dealing with uncertainty and extreme situations in urban areas mainly emerging from climate change.

Contents:

1. Overview of climatic systems and urban environment
2. Present facts about climate change and its projected consequences on development sectors like agriculture, infrastructures, industries and human settlements; implications for planning
3. Measuring climate change risks, fundamentals of risk management, mitigation and adaptation measures, community based adaptations
4. Climate disaster resiliency, policies and strategies for climate resilient developments, green infrastructures, financial instruments, best practices

Tutorials: Notes, seminars, etc.

Reference Books:

Neeraj Prasad: Climate Resilient Cities: A primer on reducing vulnerabilities to disasters
United Nations: Global Assessment Report on Disaster Risk Reduction
Lawrence J. Vale: The Resilient City: How modern cities recover from Disasters

ARL519: METRO AND REGIONAL PLANNING

3-0-0 Cr. -3

Objectives: The objective of the course is to introduce the fundamentals of regional development and factors influencing its growth and planning process.

Course Contents:

1. Urban growth and system of cities: growth of metropolitan and mega cities scale, complexity and its impact on national development.
2. Metropolitan growth - Trends, characteristics, problems and socio-economic and political issues in India.
3. Primacy, polarization and processes of metropolitan growth in India, emergence of mega cities. Economic and unintended growth in metropolitan areas. Multi nuclei development and functional inter-linkages.
4. Concept of growth centres, growth pole, service centre and agro-politan district concept and their approaches. Regional imbalances and inequalities in India, Decentralised planning approaches for regional development.
5. Planning for new towns - types, design criteria -development process and issues; New towns approach in India - small and medium town development



6. Issues in metropolitan management governance - Approaches to institutional development, financing and land management case studies from India and developing countries.

Tutorials: Notes, seminars, etc.

Reference Books:

S.L.Goel & S.S. Dhaliwal: Urban Development & Management
Shri Bhagwan Dahiya: Theoretical Foundations of Development Planning

ARL453: URBAN ECONOMICS

3-0-0 Cr. -3

Objectives: The course introduces the key principles and concepts in economics of urban growth. It highlights on some of the significant parameters in the economic development of urban regions and approaches for addressing them in planning processes

Contents:

1. General introduction to principles of economics of central, state and local governments; Fiscal programming and budgeting; National and five year plans – appraisal
2. Importance of economics relating to the urban development, Problems of employment and investment, revenue and expenditure.
3. Economic base of cities and regions, planning for economic development;
4. Economic concept of land; landuse pattern and land values; location economics, demand forecasting & factors affecting land supply and demand.
5. Government by Markets: private development initiatives, rent-seeking and its impact on land supply, groups' decisions and its effect on land supply and demand,
6. Property Rights: ownership right, user right, and exchange right - its implication on land supply, type of land development, cost of development, and method of disposal.
7. Master Plan, Zoning, and other planning regulations and their impact on supply. Private land assembly, co-operatives in land development, land pooling and plot reconstitution, land sharing, land lease, land readjustment techniques and their effect on supply.

Tutorials: Notes, tests, seminars, etc.

Reference Books:

ITPI Reader volume on Land Economics
B.L. Mathur : Economic Planning & Development Theory & Practice



ARL439: PROJECT FORMULATION AND APPRAISAL 3-0-0 Cr. -3

Objectives: The course intends to introduce various methods practiced in the project planning and implementation. It appraises students of different types and stages of project development and instruments for effective implementation and evaluation.

Contents:

1. Introduction to Projects, Nature of planning projects - Project Life Cycle - Identification - Issues involved in identification including source of the project.
2. Formulation: Links between projects and local, state and national level planning including sectoral policy, pre-feasibility studies, opportunity studies,
3. Aspects of appraisal: Technical, Financial, Economic, Commercial, Sociological, Institutional, Environmental and anthropological appraisal of projects.
4. Methods of Appraisal: UNIDO, Little-Mirrlees, ZOPP/GOPP, etc. Use of the subject project appraisal in planning.
5. Policy parameters in dealing with project - finance, cost recovery, standards, operational maintenance, institutional arrangement, design viability, density and cost, public participation, etc. and how these affect the project.
6. Planning projects: Scale, Cost, Space and Time variations. Demand analysis and forecasting, Market analysis.
7. Various stages of project: Identification/Source, project formulation, Detailed Project Report: content and context and its use.

Tutorials: Notes, tests etc.

Reference Books:

Dr. B.C. Punmia, K.K. Khadelwal: Laxmi Publications (P) Ltd : Project Planning and Control with PERT & CPM
PERT and CPM Principles and Applications L.S. Srinath : Affiliated East-West Press Pvt. LTd.
Reading Material on Project Formulation and Appraisal, Dr. A.N. Sachithanandan, ITPI, New Delhi

ARP504: PLANNING STUDIO – III 0-0-6 Cr. -3

Objective: The objective of this studio is to expose the students to various complex issues involved in the planning and management of large urban agglomerations.

Contents:

The selection of the case study may be based on the geographical location, population size, functional category, rate of growth etc.



City assessment shall be done through a ten day visit to the selected city/ large urban area by group of students, prepare existing land use (broad), collect necessary secondary information, discuss/survey public about the problems, vision etc.

Expected Outcomes & Assignment

The output of this studio exercise shall be the preparation of a 'structure plan', a 'city development strategy' comprehensive development plan of a large city

ARD501: PROJECT PHASE –I (DISSERTATION) - - - Cr. - 6

Objectives: The objective of the subject is to enable the students to select and carry out research on the relevant topic in the field of Urban Planning. It is to be carried out on an individual basis from the conception of the idea through conduct of the research to the preparation of a final report and presentation.

Contents:

The dissertation programme includes the following three major stages in view of the objectives listed above. These stages may be overlapping to a certain extent as the entire exercise is to be viewed as a process.

- Stage-1 Selection of topic and introduction
- Stage-2 Identification of case studies and literature and review
- Stage-3 The documentation and presentation

ARD502: PROJECT PHAS-II (THESIS) - - - Cr. -09

The subject of the thesis project shall be selected by the student and approved by the Department. The topics should be on current research and professional planning interests. The project shall be worked out by the student himself/ herself under the guidance of the thesis advisor(s).

The project work shall include an intensive study of relevant literature, case studies, data collection and interpretation, analysis of problems and issues concerned with the study area and formulation of guidelines.

Project evaluation shall be done as per the guidelines issued by the Department. Project work shall be periodically evaluated as per Project (thesis) programme.



CREDITS SYSTEM

Education at the Institute is organized around semester-based credit system of study. The prominent feature of the credit system is a process of continuous evaluation of a student's performance and flexibility to allow a student to progress at an optimum pace suited to his/her ability, subject to fulfilling minimum requirement for continuation. A student's performance is measured by number of credits he/she has earned (i.e. completed satisfactorily). Based on the course credits and grades obtained by the student, Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated. A minimum number of earned credits and minimum grade point average should be acquired in order to qualify for the award of graduate degree. Details are given in Rules and Ordinances Book.

Credit requirement

A student is required to earn minimum of 320 credits in eight semesters. These credits are to be earned from different category of courses like, Basic Sciences (BS), Departmental Core (DC), Departmental Elective (DE), Humanities & Management (HM), Open Course (OC) and Audit Course (AU).

Calculations of SGPA & CGPA

Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA) is calculated as follows,

$$\text{SGPA} = \frac{\sum_{\text{semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses except audit}}{\sum_{\text{semester}} (\text{Course credits}) \text{ for all courses except audit}}$$

$$\text{CGPA} = \frac{\sum_{\text{semester}} (\text{Course credits} \times \text{Grade points}) \text{ for all courses with pass grade except audit}}{\sum_{\text{semester}} (\text{Course credits}) \text{ for all courses except audit}}$$



GRADING SYSTEM

Continuous evaluation process, based on student’s performance in uniformly placed I & II Sessional Examinations, Teachers Assessment (TA) and End-Semester Examination for each course. At the end of semester, grades shall be awarded by course coordinator or concerned faculty as a performance indicator. Details of these grades are as given below.

Grades	Grade Points	Description of performance
AA	10	Outstanding
AB	09	Excellent
BB	08	Very Good
BC	07	Good
CC	06	Average
CD	05	Below Average
DD	04	Marginal
FF	00	Very-poor/ Unsatisfactory / Absence in End-Sem Examination
W		Attendance Less than 75 % . Not Eligible for End-Sem Examination. Shall repeat the Course
SS		Satisfactory Completion of Audit Course
ZZ		Un-satisfactory / Audit Course continuation

ATTENDANCE

100 % attendance in the class of each course is expected. However, in consideration of constrains / unavoidable circumstances, the attendance can be relaxed only to the extent not more than 25 %.

Any student having attendance less than 75 % will not be eligible to appear in End-semester Examination.

ACADEMIC CALENDER 2015-16



विश्वेश्वरय्या राष्ट्रीय प्रौद्योगिकी संस्थान, नागपूर
VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR
ACADEMIC CALENDER (2015-2016)



2015	SUN	MON	TUE	WED	THU	FRI	SAT
JULY	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	1
AUG	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
SEPT	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
OCT	27	28	29	30	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
NOV	25	26	27	28	29	30	31
	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
DEC	22	23	24	25	26	27	28
	29	30	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
JAN 2016	20	21	22	23	24	25	26
	27	28	29	30	31	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
FEB	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
MAR	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
APR	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
MAY	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
JUNE	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
JUL	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16

AUTUMN (ODD SEM)		SPRING (EVEN SEM)	
27 Jul, 2015	Commencement of classes	4 Jan, 2016	Commencement of classes
15 Sep, 2015	Last date for display of Sessional-I marks & attendance	16 Feb, 2016	Last date for display of Sessional-I marks & attendance
16 Oct, 2015	Last date for display of Sessional-II marks & attendance	24 Mar, 2016	Last date for display of Sessional-II marks & attendance
12 Nov, 2015	Last date of formal teaching & display of attendance & internal marks	22 Apr, 2016	Last date of formal teaching & display of attendance & internal marks
1 Dec, 2015	Last date for display of final grades	10 May, 2016	Last date for display of final grades
3 Dec, 2015	Submission of marks	11 May, 2016	Submission of marks
26 Nov-1 Dec	Registration for next semester	05-09 May	Registration for next semester
18 Dec-1 Jan	Winter /Summer Vacation (for teachers)	30 May-14 Jul	Winter /Summer Vacation (for teachers)
01 - 31 Dec	Ph.D. Progress seminar	1 Jul - 31 Jul	Ph.D. Progress seminar
14 - 17 Dec	Re-examination	23-27 May	Re-examination
21 Dec, 2015	Last date for display of Re-exam marks	30 May, 2016	Last date for display of Re-exam marks
4 Jan, 2016	M. Tech. Project Submission/Examination	15/30 Jun, 2016	M. Tech. Project Submission/Examination
17-18 Oct, 2015	Commencement of classes for next semester	25 July, 2016	Commencement of classes for next semester
26-27 Dec, 2015	AXIS	27-28 Feb, 2016	AXIS
STUDENTS EVENTS		STUDENTS EVENTS	
Alumni Meet		Alumni Meet	

HOLIDAY		HOLIDAY	
26 Jan	Republic Day	8 Apr	Gudi Padwa
7 Mar	Mahashivratri	19 Apr	Mahavir Jayanti
23 Mar	Holi	25 May	Buddha Purnima
25 Mar	Good Friday		
SUMMER TERM			
31 May, 2016	Registration for Summer Term		
01 Jun, 2016	Commencement of classes		
13 Jun, 2016	Sessional I		
15 Jun, 2016	Display of Sessional I Marks		
30 Jun, 2016	Sessional II		
2 Jul, 2016	Display of Sessional II Marks		
19 July, 2016	Display of Attendance & Internal marks		
20-21 Jul, 2016	End Semester Examination		
23 Jul, 2016	Last date for display of grades		

EXAMINATIONS			
Slot	I Sess	II Sess	Re Exam
A	8 Feb	16 Mar	25 Apr
B	9 Feb	17 Mar	26 Apr
C	10 Feb	18 Mar	27 Apr
D	11 Feb	19 Mar	28 Apr
E	12 Feb	20 Mar	29 Apr
F	13 Feb	21 Mar	30 Apr
G	14 Feb	22 Mar	1 May
H	15 Feb	23 Mar	2 May
I	16 Feb	24 Mar	3 May
J	17 Feb	25 Mar	4 May
I & J Slot are for Project Final Evaluation			



OTHER INFORMATION

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