

First Semester (Integrated)

MPIS101 **Area Planning Studio**

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

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

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

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

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

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

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

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

Suggested Readings:

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

MPIS102 Introduction to Information Systems

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

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

Unit 1: Information System Concepts and Components

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

Unit 2: Information Systems for Planning

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

Unit 3: Data Sources

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

Unit 4: Information and Communications Technologies

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

Unit 5: Future Information Systems

Cloud computing; Characteristics and components; 3D visualization; Big data management; Online Analytical processing; Data warehousing and data mining; Data sharing and security.

Suggested Readings:

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

MPIS103 Evolution of Human Settlements and Planning

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

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

Unit 1: Planning Concepts

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

Unit 2: Rational Planning Approaches and Models

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

Unit 3: Techniques of Plan Preparation

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

Unit 4: Methods and Tools

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

Unit 5: Emerging and Future Trends

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

Suggested Readings:

1. Baker, M. (2001), *Some Reflections on Strategic Planning Processes in Three Urban Regions*. Planning Theory and Practice, 2, (2), pp. 230-235.
2. Colin Buchanan (1963), *Traffic in Towns*, HMSO Publications, London, UK.
3. Faludi. A (1973), *Planning Theory*; Pergamon Press, Oxford, England, UK.
4. Friedman, J (2005), *The World is Flat: A Brief History of 21st Century*; Farrar, Straus and Giroux publishers, USA.
5. Lane, M. B. (2005), *Public Participation in Planning: An Intellectual History*, Australian Geographer, 36(3), 283-299.

MPIS104 Planning Techniques and Quantitative Methods

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

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

Unit 1: Introduction to Statistical Methods

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

Unit 2: Probability, Sampling distributions and Testing of Hypothesis

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

Unit 3: Correlation and Regression

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

Unit 4: Application of vital statistics in Spatial Planning.

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

Unit 5: Demography

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

Note: Examples from spatial planning to be applied in each unit.

Suggested Readings:

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

MPIS105 **Habitat and Environment Planning**

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

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

Unit 1: Components of Nature and Ecology

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

Unit 2: Global & Local Concerns for Environment

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

Unit 3: Environmental Resources: Consumption, Conservation and Recycling

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

Unit 4: Housing and Built Environment

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

Unit 5: Housing Sectors, Acts and Policies

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

Suggested Readings:

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

MPIS106 Infrastructure Planning

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

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

Unit 1: Introduction to Infrastructure Planning

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

Unit 2: Physical Infrastructure

Role of physical planner in planning of utilities and services; Systems and network layouts of Water supply distribution system, storm water drainage system, sewerage system, Rainwater harvesting and land requirements; Design principles of utilities; Collection, treatment, distribution and disposal aspects of solid waste management; Power generation, distribution and transmission; design standards of utilities.

Unit 3: Social Infrastructure

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

Unit 4: Transportation

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

Unit 5: Emerging and Future Infrastructure

Spatial data as infrastructure; Impact of technology on infrastructure, SCADA; Smart technology applications in utilities and services.

Suggested Readings:

1. Dinesh M, Omer T, Michael S, Michael J, (2009), *Road Safety in India: Challenges and Opportunities*. Transport Research Institute, University of Michigan, USA.
2. *Government of India*, (2010), *Service level benchmarks for urban transport*, Ministry of Urban Development.
3. Jaun de Dios Ortuzar, Luis Willumsen, G. (2011), *Modelling Transport* (4th Edition), Routledge, New York.
4. Jean-Paul Rodrigue, Comtois, C., and Slack, B., (2006), *The Geography of Transport Systems*. Routledge, New York.

MPIS107 Socio-Economic Dimensions in Planning

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

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

Unit 1: Introduction to Sociology

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

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

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

Unit 3: Applied Economics – Goods and Services

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

Unit 4: Land Economics

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

Unit 5: Economics of Location and Planning.

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

Suggested Readings:

1. Benjamin S (2008), *Occupancy Urbanism: Radicalizing Politics and Economy beyond Policy and Programs*, International Journal of Urban and Regional Research, Vol. 32(3), pp.719-729.
2. Brenner N and Theodor N (2002), *Cities and Geographies of “Actually Existing Neoliberalism”*, Antipode, Vol. 34(3), pp.349-379.
3. De Souza M (2010), *Which Right to Which City? In Defense of Political- Strategic Clarity*. Interface, Vol. 2(1), pp.315-333.
4. Jan L, Christopher M. (2012), *The Urban Sociology Reader*. Routledge, London.

Second Semester

MPTI201 **Transport Planning Studio**

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

Objective: *This studio would provide a basic understanding of transport planning process, the data collection techniques for transport surveys and analysis of surveys to do a 4-step modelling using standard transport planning software. The aim would be to incorporate the transport model simulation in making transport plan of a city.*

Unit 1: Application of transport modelling software: This module will develop students' transport modelling capabilities required for network assignment modelling.

Unit 2: Transport Plan for a City: The modelling simulations learnt through the first module would be applied in making a transport plan for a city. This would entail collection of primary data through various transport surveys and secondary data through existing reports and plans. Scenario building would be done and proposals would be framed based on the simulations developed with varying modelling assumptions.

Suggested Readings:

1. Daamen, W. et. al. (2017), *Traffic Simulation and Data: Validation Methods and Applications*, CRC Press, USA.
2. Flaherty, C A O' (1996), *Transport Planning and Traffic Engineering*, CRC Press, USA.
3. Ortúzar, J. De and Willumsen, L. G. (2011), *Modelling Transport*, John Wiley and Sons, United Kingdom.

MPTI202 Geospatial Techniques for Transportation

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

Objective: To equip with the concepts of geo-informatics and computing skills in the relevant software, associated scientific tools, and their relevance and applicability for transportation and infrastructure planning.

Unit 1: Introduction to Geo-Informatics

Definitions – Geoinformatics, Remote Sensing, Geographic Information Systems (GIS), Spatial Data Infrastructure; the concept of earth surface projections and geoids; limitations of DBMS, engineering drawings and CADD packages – the need for GIS, Spatial and non-spatial data, raster and vector data, spatial thematic models.

Unit 2: Geographic Information Systems for Transport Planning

Spatial data analysis - buffer, overlay, 3D analysis and modelling; Emerging and advanced technology - web-enabled GIS, GPS tracking and monitoring, model builder, transparency through GIS, community participation through GIS, monitoring and management, mobile geo-spatial data collection, aerial mobile mapping, emergency response planning.

Unit 3: Information Management Systems for Transportation

Transportation Information Systems (TIS), geo-spatial standards, data sources, issues, guidance and services for transportation and infrastructure planning; Intelligent Transport Systems (ITS); Executive information system; Pavement management system, bridge management, maintenance management, safety management; Transportation System Management (TSM), toll modelling, travel demand forecasting and freight movements, simulation models; Corridor preservation and right-of-way, construction management; Hazardous cargo routing, overweight/oversize vehicles permit routing, accident analysis, environment impact, land side economic impact and value-capture analysis and Others.

Unit 4: Applications in Transportation and Infrastructure Planning

Preparation of transportation network, infrastructure maps, etc.; Planning and design for transport networks; Planning for hazardous material release incidents, risk analysis and decision making; Evacuation planning, development of new traffic analysis zones.

Unit 5: Project work

To develop/submit lab based assignments and portfolios on application of geo-spatial techniques for transport related projects.

Suggested Readings:

1. Cambell, J.B. (2002), *Introduction to Remote Sensing*, Taylor & Francis, London.
2. Jamwal, A.K. (2008), *Remote Sensing and GIS*, JnanadaPrakashan, Delhi.
3. Jan Van Sickle (2010), *Basic GIS Coordinates*, Second Edition, CRC Press; 2ndEd., USA.
4. Richards, J.A. and Xia, X. (2006), *Remote Sensing Digital Image Analysis: An Introduction*, Birkhauser, London.
5. Thill Jean-Claude (2000), *Geographic Information Systems in Transportation Research, Transportation Research Part C: Emerging Technologies*, Vol. 8, pp. 3-12.

MPTI203 Highway Planning and Traffic System Design

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

Objective: To equip with the knowledge on highway planning and traffic system design with respect to planning, design and management.

Unit 1: Highway Planning and Management

Trends in highway planning and road development in country; classification of highways; locations and functions; planning approaches for rural roads, highway administration and finance; surveys and investigations, traffic surveys, alignment and route location, drainage studies, soil investigation; overview of Highway Asset Management.

Unit 2: Highway Capacity and Design Standards

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

Unit 3: Traffic Flow and Capacity

Road user and vehicle characteristics, fundamentals of traffic flow and relationship between the traffic flow variables; Definition of capacity and level of service, factors affecting capacity and level of service, static and dynamic PCU, design service volume, capacity norms for urban roads with different widths.

Unit 4: Design of Road Infrastructure System

Road cross sectional elements; Road hierarchy and design considerations of urban and rural roads; Road alignment, horizontal curves, vertical curves; Design principles of intersections. Footway and pathway design - Criteria, network design principles, cross-section design, signage and marking, lighting and barriers; pedestrian precincts; Cycleway design - low cost bicycle supply and promotion; design criteria; classification; network design principles; cross-section design; signage and marking; bicycle parking facilities; Pedestrian and bicycle crossing facilities - crossing facilities; pedestrian crossing behaviour; crossing signals.

Unit 5: Traffic Management Systems

Introduction to traffic signals, warrant for signals, phasing and inter green period, saturation flow, optimization of signals, Vehicle actuated signal facilities, co-ordination of traffic signal, area traffic control system; Traffic System Management (TSM) with IRC standards -- Traffic Regulatory Measures, Travel Demand Management (TDM).

Suggested Readings:

1. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski (2011), *Principles of Highway Engineering and Traffic Analysis*, Wiley India Pvt. Ltd., New Delhi.
2. Garber and Hoel (2010), *Principles of Traffic and Highway Engineering*, CENGAGE Learning, New Delhi.
3. Kadiyali. L.R. (2013), *Traffic Engineering and Transport Planning*, Khanna Publishers, Delhi.
4. Khanna. S.K., Justo. C.E.G. and Veeraragavan A. (2014), *Highway Engineering*, Nemchand Publishers, Delhi.
5. Tyworth, J. E. (1996), *Traffic Management Planning, Operations and Control*, Addison Wesley Publishing Company, USA.

MPTI204 Urban Transport Planning

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

Objective: *To introduce various components of transport planning in urban areas and familiarize with transport planning methods.*

Unit 1: Urban Transport and Land Use

Urban activity systems, urban road structure, urban forms and structure and its impact on travel pattern, land use-transport cycle, concept of accessibility and its impact on land use;urban structure and public transport,urban passenger transport system characteristics, public transport modes;urban freight transport;principles of land use- transport model, transit oriented development (TOD).

Unit 2: Urban Transport Planning Process

Transport planning process, study area delineation, data needs and outputs; sketch planning methods, demand estimation from traffic counts, quick response techniques for travel demand estimation (QRT); vehicle ownership forecasting, graph theory application in network analysis.

Unit 3: Transport Demand Modelling

Aggregate demand modelling approach- trip generation models, trip distribution models and its calibration, modal split models and its calibration, traffic assignment techniques; calibration and validation checks; alternate scenario development, model testing and evaluation;demand for public transport; freight generation models.Disaggregate travel demand models, measurement of choice, stated preference techniques, willingness to pay, stated discrete choice models- probit model, logit model; calibration of choice models, abstract mode choice, value of time, generalized cost, etc.

Unit 4: Planning for Sustainable Transport

Concepts of sustainability; Sustainable transport systems, NMT, public transport. Planning principles and process; Planning norms and standards; planning frameworks for NMT infrastructure improvements; Analytical methods - NMT site analysis; NMT network analysis.NMT Facilities - Facilities on Highways and Primary Arterials, Designs based on Roadway function, Safety and Intersections; Local Street Design with respect to NMT; Financing NMT Infrastructure.Planning for NMT - Integration of NMT into transport master plans.

Unit 5: Case studies on sustainable transport projects

Planning for sustainable transport projects and global best practices.

Suggested Readings:

1. Dios Ortuzar J. (2001), *Modelling Transport*, Wiley, New York.
2. Hook, W. (2005), *Non-Motorized Transport*, Federal Ministry for Economic Cooperation & Development, Germany.
3. Kadiyali L. R. (2013), *Traffic Engineering and Transport Planning*, Khanna Publishers, New Delhi.
4. O'Flaherty C.A. (1997),*Transport Planning and Traffic Engineering*, Elsevier, CRC Press, USA.

MPTI205 Public Transport Planning

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

Objective: *To introduce various concepts of Public Transport and NMT, and how Public Transport and NMT can be integrated into the Transport Network.*

Unit 1: Introduction to Public Transport Systems

Urban passenger transport system characteristics, public transport modes, genesis of public transport system, mass transit system, Para transit system, technological features, Demand for public transport, public transport demand and supply indicators, public transport supply and demand characteristics in cities of various sizes and socio economic setting. Public transport based city forms and structure, Transit Oriented Development (TOD); Impact of city density, size, activity concentration.

Unit 2: Public Transport Network Planning and Operations

Form, type and density of bus network and principles; Types of bus priority measures, merits and limitations, case studies; bus operation design, scheduling and time table, pedestrian –public transport interface; Bus Terminals; interchange- concepts, function and guidelines; bus depot-concepts, function, activity and land requirements, guidelines.

Unit 3: Public Transport Infrastructure

Design of Bus stops/shelters, Depots, Terminals, multimodal interchanges.

Unit 4: Public Transport Performance and Economic Aspects

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

Unit 5: Feeder Systems

First and last mile connectivity to mass transit systems, cycling, walking and para transit system; Types, function and role of para transit, planning principles, operation and maintenance of para transit systems; Institutional aspects and performance assessment.

Suggested Readings:

1. Chakraborty and Das (2009), *Principles of Transportation Engineering*, PHI Learning, India.
2. Nash, C.A. (2007), *The Economics of Public Transport*, Longman, London.
3. Vuchic, V.R. (1981), *Urban Public Transportation Systems and Technology*, Prentice-Hall, Inc., USA.
4. White, P. (1988), *Public Transport Planning, Management and Operation*, Hutchinson, London.

MPTI206 Transport Economics

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

Objective: *To impart basic understanding of economics associated with transport and infrastructure.*

Unit 1: Transport Demand and Supply

Movement, transport and location; Transport and economic development; Demand for transport; Factors influencing transport demand; Elasticity of demand, measures of elasticity; Supply and demand forecasting for transport.

Unit 2: Costing and Pricing of Transport services

Fixed and variable cost; Joint and common cost; Cost allocation; User cost internal cost, external cost, economic cost; Principle of pricing, marginal cost pricing; Price determination; Operational objectives of pricing; Revenues and subsidies.

Unit 3: Principles of Economic Appraisal

Basic principles of appraisal; Benefit valuation; Cost benefit analysis; Multi criteria analysis.

Unit 4: Regulation of Transport and Infrastructure

Theory of regulation; Priorities in transport policies; Priorities in infrastructure policies; Service Level Benchmarks; Regulatory reforms and coordination.

Unit 5: Financing Transport Infrastructure

Transport costing and financing sources, pricing principles, cost recovery pricing, deficits; Financial capital investment, , capital market/debt; Alternative Financing Mechanisms, Multilateral and Bilateral Financing mechanism, Financial Institutions, Private sector participation, land as a resource, public private partnership

Suggested Readings

1. Dash, L. N. (2007), *Economics of Infrastructure: Growth and Development*. Regal Publications, Delhi.
2. Picot, A., Florio, M. & Kranz, N. G. a. J. (2015), *The Economics of Infrastructure Provisioning*. MIT Press, USA.
3. Prassas, E. S. R. R. P. (2013), *Engineering Economics and Finance for Transportation Infrastructure*. Springer, Heidelberg.

MPTI211 Sociology and Transport Planning (Elective)

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

Objective: *To understand an overview of the various aspects related to the importance of sociological factor particularly the human and psychological dimensions of transport.*

Unit 1: Sociological Principles

Urban and rural Society; Social structure and physical pattern of rural and urban communities; Social Mobility, migration, and commutation; Urban and sub urban living and social mobility.

Unit 2: Social Aspects of Transport Sector

Traffic as a social system; People, occupation and travel; Evolution and change in population mobility pattern; Mental and physical health and local and distance travel; Psychological impact of physical disruption; Social quality of urban roads, streets and public places; Barrier for mobility. Travel and mobility problems of diverse people: child, youth, women, elderly and differently able; Environment quality of urban streets and pedestrian safety; Sociology of car traffic in towns and cities; Stress, noise and pollution control; Evaluation of social impact of transport.

Unit 3: Contemporary Living Pattern of Mobility

Historic and contextualized travel practices; Travel in technological culture; ICT based mobility innovations; Social features of smart transportation and smart mobility.

Unit 4: Managing Transport and Society

Rise and decline of public transport; Restructuring traffic facilities; Use of social research; Ideology and policy perspective of urban transportation; User friendly design of places for safe mobility and travel for all; Efficient transport plan; Management and control of the environmental impacts of transport systems in communities and cities.

Unit 5: Planning for Mobility of transport disadvantaged

Transport disadvantaged groups, mobility needs of transport disadvantaged groups; planning principles and approaches of disadvantaged, differently-abled groups; Concept of accessibility; Best Practices.

Suggested Readings:

1. Boer Enne de (Ed.)(2011), *Transport Sociology - Social Aspects of Transport Planning*, Pergamon Press, Oxford.
2. Government of India (2006), *National Urban Transportation Policy*, Ministry of Urban Development, New Delhi.
3. Peters F.P.(2006), *Time, Innovation and Mobilities: Travel in Technological Cultures*, Taylor & Francis, UK.

MPTI212 Transport and Environment (Elective)

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

Objective: *To advance critical abilities to understand and solve real-world environmental impacts and effects stemming from transport network and infrastructure on the environment, and propose ways in which the long-term development of transport can be made environmentally sustainable.*

Unit 1: Road Transport and Environment

Elements of environment affecting the mobility of people and goods; Impacts of transport on environment –an introduction; Transportation and energy consumption; Alternative fuels; Road vehicle technology and performance.

Unit 2: Assessment of traffic related pollution

Vehicle emissions and trends; Effects of Vehicle Emissions; Transport dependent GHG emissions; Dispersion modelling approaches; Noise Pollution and associated impacts.

Unit 3: Principles of traffic impact assessment

Impact of Traffic on Public Health - accessibilities, active modes and health promotion; Impact of new road infrastructure; Road building materials and impacts; Accidents; Manufacture and disposal of vehicles.

Unit 4: Environmental Impact Assessment for transport projects

Basic introduction to EIA; Scoping and Baseline Studies; Impact Prediction and Evaluation - NATA assessment methods, Analysis of Potential Environmental Impact and Mitigation Measures, Discussion of case examples - EIA of Highway projects.

Unit 5: Environmental Management Plan for transport projects

Case studies of various transportation projects and their associated environmental management plans.

Suggested Readings:

1. ASCI (2010), *Environmental Impact Assessment Guidance Manual for Highways*, Ministry of Environment and Forest, India.
2. McKinnon, A., Cullinane, S., Whiteing, A., Browne, M. Kogan (2010), *Green Logistics: Improving the Environmental Sustainability of Logistics*, Kogan Page Publishers, New Delhi.
3. Morris, P., Therivel, R. (2001), *Methods of Environmental Impact Assessment*, Spon Press, London.
4. Rodrigue, J. P., Comtois, C., Slack, B. (2017), *The Geography of Transport Systems. Transport, Energy and Environment*, Routledge, United Kingdom.
5. The Royal Society of Chemistry (2004), *Transport and the Environment: Issues in Environmental Science and Technology*, United Kingdom.

Third Semester

MPTI301 Transport Infrastructure Planning Studio

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

Objective: *To strengthen the capabilities of student in conducting feasibility studies using statistics and operation research of transport infrastructure of interurban/regions/special areas. To plan, design and institutionalize the transport infrastructure projects with concepts and strategies.*

Unit 1: Application of Micro simulation

Various analytical quantitative techniques and methods for transport infrastructure; recent advancements in transport models; application of statistical and transport planning software, data requisition and survey methods; Structure and approach to feasibility studies. Micro-simulation using dedicated software packages

Unit 2: Detailed Project Report study on transport infrastructure planning, design and management for a case study

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

Suggested Readings:

1. Blonk, W.A.G. (1979), *Transport and Regional Development*. Saxon House, Farnborough.
2. O'Flaherty, C.A. (2000), *Transport Planning and Traffic Engineering*, Dept. of Transport, USA.
3. Ortúzar, J. De and Willumsen, L. G. (2011), *Modelling Transport*, John Wiley and Sons, United Kingdom.
4. Verma A. (2010), *Integrated Public Transportation System: Planning and Modelling*. VdmPublishing House, Mauritius.
5. Vinod K. T. M. (2000), *Micro Regional Transport Planning / Research*. School of Planning and Architecture, Delhi.

MPTI302**Advanced Research Methods**

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

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

Unit 1: Introducing Research

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

Unit 2: Developing Thesis

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

Unit 3: Research Ethics

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

Unit 4: Field Work Plan

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

Unit 5: Research Communication

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

Suggested Readings:

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

MPTI303 Logistics and Freight Distribution

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

Objective: *To provide a comprehensive overview of the main issues related to the increasingly important fields of freight transport, logistics and supply chain management (SCM) and all relevant aspects related to operations management.*

Unit 1: Concepts of logistics and supply chain

Introduction to logistics and distribution, integrated logistics and supply chain, customer service and logistics, channels of distribution, role of 3PL and 4PL, key issues and challenges for logistics. Planning framework for logistics, logistics processes, supply chain segmentation, logistics network planning, logistics management and organisation, manufacturing and materials management.

Unit 2: Inventory planning and management

Basic inventory planning and management, inventory and supply chain, purchasing and supply, storage and handling systems, order picking and replenishment,

Unit 3: Freight transport systems

Maritime transport, air transport, rail and intermodal transport, road freight transport: vehicle selection; Operational costs.

Unit 4: Freight terminals and warehouses

Design of freight terminals; Principles of warehousing, warehouse design, warehouse management and information.

Unit 5: Freight distribution and management

Principles of freight distribution, management of freight traffic, Cost and distribution economics, performance monitoring, benchmarking, information and communication technology in freight distribution, security and safety issues; logistics and environment.

Suggested Readings:

1. Rushton, A. et. al. (2010), *The Handbook of logistics and Distribution Management*, Kogan Page Limited, United Kingdom.
2. Waters, D. (2010), *Logistics: An Introduction to Supply chain Management*, Palgrave Macmillan, New York.
3. Ghiani, G. et. al. (2004), *Introduction to Logistics Systems Planning and Control*, John Wiley and Sons Ltd. United Kingdom.
4. Tseng, Y. et. al. (2005), The Role of Transportation in Logistics Chain, *Proceedings of the Eastern Asia Society for Transportation Studies*, Vol. 5, pp. 1657 – 1672.

MPTI304 Smart Mobility

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

Objective: *To provide a comprehensive overview of the intelligent transport systems (ITS) and traffic control systems for providing versatile and smart mobility solutions to cater future travel demand.*

Unit 1: Smart Mobility

Concepts and components of smart mobility, role of ITS in smart mobility and smart cities; PPPs as a tool to implement smart mobility projects; smart mobility solutions for differently-abled; Integration of smart and green mobility.

Unit 2: Intelligent Transport System

Definition, concepts, types of Intelligent Transport System (ITS); ITS technology, software, equipment, Traffic management, emergency and incident management, public transport system, terminal and depot management system, parking infrastructure management, commercial vehicle management, highway surveillance, case studies.

Unit 3: Application of ITS in Transport Infrastructure

Available and emerging traffic control system technology, Area traffic control, urban traffic control system technology, transportation system management, highway control and incident management, intelligent vehicle highway system, highway surveillance, Traffic regulation and enforcement; optimisation of public transport for smart mobility; terminal management; parking management.

Unit 4: Performance, Implementation and Evaluation of ITS

Costing of ITS, ITS benefits assessment, economic and financial analysis of ITS. Implementation, case studies, institutional and organizational issues.

Unit 5: Case studies on smart mobility

Application of ITS in demand management, transport supply provision, shared mobility.

Suggested Readings:

1. Button, K. J., Hensher, D. A. (2001), *Handbook of Transport Systems and Traffic Control*, Elsevier Science, United Kingdom.
2. Sarkar, P., Jain, A.K. (2017), *Intelligent Transport Systems*, PHI Learning Private Limited, New Delhi.

MPTI305 Transport Infrastructure Design

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

Objective: *To introduce planning strategies, design considerations and standards for transportation infrastructure.*

Unit 1: Road Infrastructure

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

Unit 2: Rail Infrastructure

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

Unit 3: Airports

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

Unit 4: Ports, Docks and Harbour

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

Unit 5: Multimodal Interchange

Types of modal interchange, facility requirements for interchanges, international case studies and best practices for modal interchanges; components of modal interchange design, space standards, movement control, parking; design standards, access control design, mobility assistance.

Suggested Readings:

1. Blow, C. J. (2005), *Transport terminals and modal interchanges: planning and design*, Elsevier, United Kingdom.
2. Kadiyali L. R (2016), *Transportation Engineering*, Khanna Publishers, New Delhi.

MPTI306 Regional Transport Planning

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

Objective: *To introduce regional elements in the domain of transport planning and equip students towards enhancing regional connectivity.*

Unit 1: Overview of Regional Planning

Approach to regional planning, types of regions and their characteristics, delineation of region for transport planning; backwardness and regional disparity in development; role of connectivity and regional transport in development and backwardness.

Unit 2: Regional Transport Systems

Regional transport system, types, characteristics, regional transport supply, regional traffic and travel pattern, emerging issues.

Unit 3: Regional Travel Demand

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

Unit 4: Regional Network Analysis

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

Unit 5: Regional Transport Policy

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

Suggested Readings:

1. Blonk, W.A.G. (1979), *Transport and Regional Development*. Saxon House, Farnborough.
2. Verma A. (2010), *Integrated Public Transportation System: Planning and Modelling*. Vdm Publishing House, Mauritius.
3. Vinod K. T. M. (2000), *Micro Regional Transport Planning / Research*. School of Planning and Architecture, Delhi.

MPTI311 Port Planning (Elective)

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

Objective: *To provide the knowledge on types of ports, planning concerns of port areas, institutional arrangements for planning. The syllabus focuses on the preparation of spatial plans for port area plans with a special focus on port performance and commodity analysis.*

Unit 1: Introduction

Evolution of ports, role of ports in the economy, importance of trade and shipping industry, major ports, minor ports, land lard ports, coastal shipping, container shipping, IC terminals in India, glossary of port planning, regulatory framework of ports in India

Unit 2: Port Infrastructure

Port components; Ship size and cargo characteristics; Port Infrastructure for cargo handling and storage, marine access infrastructure, cargo specific berths and port facilities.

Unit 3: Port Master Planning

Principles of Port Planning, Port connectivity, Processing and non-processing zones, institutional arrangements, Commodity analysis and requirements, transit efficiency parameters. Land requirements for port operations.

Unit 4: Port and its impact on hinterland

Evolution of port-city relationship, AnyPort Model, port-city relationship; Traffic and Social impact assessment of port on hinterland; Captive and non-captive hinterlands assessment.

Unit 5: Case Studies

Greenfield port, major and minor ports, port planning best practices.

Suggested Readings:

1. Daamen, T. Marcel V.G. (2006), *Development challenges in the evolving port city interface, defining complex development problems in European main seaport-city interface: Rotterdam and Hamburg*, International Association of Cities & Ports (Conference Paper).
2. Ministry of Shipping (2016), *Sagarmala, National Perspective Plan of Indian Ports*, Government of India, New Delhi.
3. Pedquera .M.A., Ruiz J.R. (1996), *Sustainable Development strategies for cities and ports*, United Nations (Monograph).
4. Takel, R. E. (1983), *Planning land use in port areas: getting the most out of port infrastructure*, United Nations (Monograph).
5. Thoresen, Carl A. (2003), *Port designer's handbook: recommendations and guidelines*, Thomas Telford, London.

MPTI 312 **Transport Infrastructure for Tourism Sector (Elective)**

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

Objective: *Understanding of tourism planning process, provision and production of infrastructure services in destination, departure, transit and arrival place.*

Unit 1: Tourism Concepts, Theory, and practice

Introduction to Tourism – Concepts, theories, approaches and methods of tourism studies – Recreation, Leisure, travel and tourism - Types of tourism – Tourism regions – Tourism scenario - Tourist circuits – Tourism as Industry

Unit 2: Determinants of Tourism Demand

People and travel habits – Tourist flow and tourism traffic analysis – Access to tourism: Gender, Age, Elders and differently able people - Environment responsive tourism – Tourism and environment sensitive areas- Tourism impact on environment – Disaster, pollution and tourism - Climate change

Unit 3: Tourist Transport Modes

Rural and urban tourism – Modes of Travel - Hotel and hospitality services - Transportation networks and destinations – local public transport system - Walk ways, cycle tracks, para-transit modes and NMT, water ways, rope ways.

Unit 4: Planning transport infrastructure for Tourism

Infrastructure planning for sustainable tourism: The social practices approach - The role of transport infrastructure in international tourism development: A gravity model approach - Tourism and international trade - Planning transport for special events - Tourism infrastructure: inequality and externality issues – Tourism Infrastructure support services – Travel safety and security – Walkways and informal sector; Transport Infrastructure in tourist precincts.

Unit 5: Transport Policies and Tourism Governance

Government and local community in creation of tourism infrastructure – Tourism policies and legislations - Tourism development and happiness: Residents’ perspective - Collaborative tourism planning - Digital destinations - Destination branding: The role of consumer affinity

Suggested Readings:

1. Govt. of India, (2015), *Tourism Policy of India*, Ministry of Tourism, New Delhi
2. Jamal T and Robinson M, (2005), *Introduction to Tourist Transport*, Sage Publications, United Kingdom.
3. Khadaroo J, (2007), *Transport infrastructure and Tourism development*, Annals of Tourism Research, Vol.34. No 4 pp1021-2032.
4. Majumder, R, (2008) *Infrastructure and Development in India*, Rawat Publications, New Delhi.
5. Roday.S, Biwal.A. &Joshi.V, (2009), *Tourism Operations and Management*, Oxford University Press, London.

MPTI313 Transport Infrastructure Finance (Elective)

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

Objective: *To impart concepts related to transport infrastructure, mechanism and role of alternative financing mechanism and its relevance with the institutional framework.*

Unit 1: Transport Infrastructure

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

Unit 2: Transport Costing and Recovery

Transport costing, pricing principles, cost recovery pricing, deficits; Financial capital investment, municipal development funds, capital market/debt

Unit 3: Alternative Financing Mechanisms

Multilateral and Bilateral Financing mechanism, Financial Institutions, Private sector participation, land as a resource, public private partnership, annuity based approach risk management.

Unit 4: Institutional and Regulatory Framework

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

Unit 5: Case studies

Highways and urban roads, Mass transport systems, Passenger terminals (rail, bus, air), interchanges, Depots, Parking complexes, Logistics hubs etc.

Suggested Readings

1. A.Richard, Richard Hemming and H.Barry (2013), *The International Handbook of Public Financial Management Center for aid and public expenditure*, Hamburg, Germany.
2. Allen .F, Yago.G (2013), *Financing the Future, Market-Based Innovations for Growth*, Pearson Publications, Indianapolis, Indiana.
3. Athena Roumboutsos, Hans Voordijk, AristeidisPantelias (2018), *Funding and Financing Transport Infrastructure*, Rutledge Publications, New York, USA.
4. Karl F Seidman (2012), *Economic Development Finance*, Sage publications, California, USA.
5. Rondinelli. A (1990), *Financing the decentralization of urban services in developing countries: Administrative requirements for fiscal improvements*, Springer-Verlag publications, New York, USA.

Fourth Semester

MPTI401 **Transport Planning Thesis**

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

Objective: To conduct independent scientific research on a topic of Transportation & Infrastructure Planning.

Each student of Planning (Transportation & Infrastructure Planning) course is required to undertake a terminal project on a subject related to Urban and Regional Transportation Development (Road, Rail, Port and Airport) concern preferably related to Travel behaviour, Land use and Accessibility, Travel demand forecasting modelling, Public transport system, Transportation Infrastructure Design and Management, transportation logistics Intelligent transport system, etc., as approved by the Department in the third semester in the course Advanced Research Methods.

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

The students are required to select a topic of their choice in consultation with the faculty members and carry out the research based on primary and secondary data analysis / interpretation followed by identification of issues and potentials culminating in policies, plans and proposals or in proving the formulated hypothesis or research questions.

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

MPTI402 Project Formulation and Appraisal

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

Objective: *Introduce aspects of project planning, management, implementation, monitoring and appraisal.*

Unit 1: Introduction to Project Planning

Concept of Project and Program, Prioritization of Projects and Programs, Nature and scale of Planning Projects, life cycle of a Project.

Unit 2: Project Formulation and Appraisal

Definition, Objectives, Importance of project formulation, Project appraisal and management; need of project appraisal, detailed project report, Feasibility studies; concepts of financial feasibility (Pay-back period, IRR, DCF, NPV, CBR), Methodology for project identification and formulation; financial cost-benefit analysis, social-cost benefit analysis.

Unit 3: Project Management

Concept of project management, Stages of project form Network analysis; concept of CPM, PERT, resource levelling and allocation, time-cost trade off aspects; Bar charts, Milestones, Techno-economic analysis of projects

Unit 4: Project Implementation

Project implementation, stages of implementation, actors in project implementation; Project monitoring techniques, integrated reporting, Milestones, time and cost overrun and under runs, unit index techniques.

Unit 5: Project Evaluation and Monitoring

Project evaluation: Life of a project; Stages, approach and steps, techniques of project evaluation: input analysis, UNIDO Approach methods; Casestudies in Transportation and Infrastructure development projects.

Suggested Readings:

1. Awani, Alfred O. (1985), *Project Management Techniques*, Petrocelli Books, New York, USA.
2. Chandra, P. (1995), *Projects: Planning, analysis, selection, implementation and review*, Tata McGraw Hill publishing, New Delhi, India.
3. F.Lawrence Bennett (2003), *Management of Construction: A Project Lifecycle Approach*, Butterworth Heinemann, Portsmouth, USA.
4. Kerzner, H. R. (2013), *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, John Wiley & Sons, New York, USA.
5. Lester, A. (2007), *Project Management, Planning and Control*, Butterworth Heineman publishing house, Portsmouth, USA

MPTI403 Transport Policy and Governance

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

Objective: *To introduce the students to Transport Policy, Legislation and Institutional Framework.*

Unit 1: Introduction to Transport Policy Making

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

Unit 2: Transport Sector Policies

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

Unit 3: Transport Legislation and Acts

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

Unit 4: Institutional Frameworks in Transport Sector

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

Unit 5: Case Studies

A review of regulating policies and case studies on national, state and regional policies and governance implications of these policies.

Suggested Readings:

1. Planning Commission National Transport Development Policy Committee (2014), *India Transport Report: Moving India to 2032*. Government of India.
2. MoUD (2006), *National Urban Transport Policy*. Government of India.
3. O'Flaherty, C.A. (2000), *Transport Planning and Traffic Engineering*, Department of Transport, USA.