Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal Universityof Technology)
Syllabus of M. Arch-Urban Development
(Effective from academic session 21-22)

CURRICULUM STRUCTURE

1ST SEMESTER

CODE	SUBJECT	L	S	P	TOTAL	CREDITS
MAR 101	Introduction to Real Estate and Urban Infrastructure, Policy Planning & Legislation	3	0	0	3	3
MAR 102	Urban Economics	3	0	0	3	3
MAR 103	Sustainable Practices in Built Environment	3	0	0	3	3
MAR 104	Research Methodology and Statistical Analysis	3	0	0	3	3
MAR 181	Basic Infrastructure Study & Analysis	0	9	0	9	9
Total		12	9	0	21	21

2ND SEMESTER

CODE	SUBJECT	L	S	P	TOTAL	CREDITS
MAR 201	Elective I	3	0	0	3	3
MAR 202	Data Analytics and digital skills for Built Environment	3	0	0	3	3
MAR 203	UUrban Infrastructure Planning	3	0	0	3	3
MAR 281	City Infrastructure Planning	0	12	0	12	12
Total		9	12	0	21	21

Elective I – Only one subject to be chosen

- Environmental Impact Assessment
- Landscape Design
- Transport Planning

3RD SEMESTER

CODE	SUBJECT	L	S	P	TOTAL	CREDITS
MAR 301	Elective II	3	0	0	3	3
MAR 381	Thesis Programming	0	12	0	12	6
MAR 382	Project formulation & Services	0	9	0	9	9
MAR 383	Summer training(8 weeks only)	0	0	48	48	3
Total		3	21	0	24	21

Elective II – Only one subject to be chosen

- Project Management
- Urban Sociology
- Urban Governance

4TH SEMESTER

CODE	SUBJECT	L	S	P	TOTAL	CREDITS
MAR 481	Thesis	0	21	0	21	21
Total		0	21	0	21	21

NOTE : FOR ALL THEORY PAPERS, INTERNAL CONTINUOUS ASSESSMENTS SHALL CONTRIBUTE **30 MARKS** TO THE **OVERALL SEMESTER SCORE OF 100 MARKS**, WHERE THE END SEMESTER EXAMINATION SHALL BE CONDUCTED FOR **70 MARKS.**

SEM 1

MAR 101- Introduction to Real Estate - Policy Planning & Legislation

Credits – 3   Sem Exam – 70 mks

OBJECTIVE - To obtain an overview of the policy implication at national and state level and their relevance at the micro level

MODULE 1 - Real estate scope, peculiarities, factors affecting real estate market, role of govt. in real estate, statutory provisions, risk management

MODULE 2 - The space market, the asset market, finance and investments; market cycles, bubbles, mitigating challenges post construction management.

MODULE 3 - Government Policies – on public & private housing – Urban Fiscal Policies – Property Taxation – local Govt. Finance – Public policies on land & real estate, Land acquisition & alienation, Land pooling, Plot Reconstitution, TOD, TDR & Premium FSI and their implications – Impact of Govt. Regulations

REFERENCES
1. *John Ratcliffe; "Urban Planning & Real estate development, (2004); Taylor & Francis pub. U.K.*
2. *Infrastructure Planning Engineering and Economics, Alvin Goodman and Makarand Hastak. (2015, McGraw Hill).*

MAR 102 - Urban Economics

Credits – 3   Sem Exam – 70 mks

OBJECTIVE - To equip with theory and measurement of urban economic growth and development, spatial structure of cities and urbanization.

MODULE 1 - Characteristics of an economy passing through different stages of urbanization Classification of urban areas by demographic, geographical and economic criteria-Process of sub-urbanization
City Size and Urban Growth -The Cost and Benefits of City Size -Optimum City Size –Migration and urban economic growth: Harris-Todoro Model –Urban externalities and growth.

MODULE 2 - Urban Spatial Structure: Features -Concepts of City Structure -The Minimization of Costs of Friction Hypothesis -Location Equilibrium of an Urban Firm -Retail Establishments -Market Areas -Consumers and Residents -The Concentric Zone Hypothesis -Urban Residential Land Use Models: Alonso, Muth, Siegel, Park Burgess

MODULE 3 - Urbanisation and Labour Market Pull and Push Factors for Urbanisation in India, High Wages, Improved Infrastructure, Employment Opportunities, Educational facilities, Growth of formal and Informal economic activities

MODULE 4 - Urban housing problem and increase in slums; Urban transport and peak load pricing; Urban environment: Air, Water and Noise Pollution;Urban poverty and inequality; Urban Infrastructure: Water Supply, Sanitation andSolid waste management.

REFERENCES
1. *Bidyut Mohanty (1993) Urbanization in Developing Countries Basic Services and Community Participation, Institute of Social Science, Concept Publishing House*

2. *J Vernon Henderson. (1985). Economic Theory and Cities. Academic Press (New York).*
3. *Briance A and Ravinder Singh, (edited) (1995) Housing the Urban Poor, Policy and Practice in Developing Countries, Sage Publications (New Delhi).*

MAR 103 - Sustainable Practices in Built Environment

Credits – 3   Sem Exam – 70 mks

OBJECTIVE - To investigate the simulation and audit techniques for assessing the energy performance, environmental response and impact of built form.

MODULE 1 - Emerging role of performance evaluation in building design and master planning- Performance audit and rating systems- GRIHA, LEED IGBC and BREAM – Architectural Computation and performance audit- Introduction to ECOTECT.

MODULE 2 - Sustainability and Habitability; Resources, Materials and Sustainability; Energy and the Built Environment Need for implementing energy efficiency on an international, national and individual basis in the context of the building industry & environmental issues. Emphasis on responses related to cultural, strategic, technological, social and physical with specific reference to climate and built forms .

MODULE 3 - Sustainable Development; Sustainable Architectural concepts in history covering Indus valley, Aryan cultures, Buddhist, Dravidian, Indo Aryan, Hoysala Architecture, Islamic , provincial style, Mughal , colonial and post-colonial architecture and components of consideration such as materials , high ventilated roofs, integrated design, lighting, ventilation, vegetation and adopting to natural environment .

REFERENCES
1. *Energy Audit of Building Systems – Moneef Krarti (Ph.D) – CRC Press 2000*
2. *Clarke, J.A., "Energy simulation in building design", Adam Hilger Ltd, Bristol, 1985*
3. *ESRU,. "ESP-r A Building Energy Simulation Environment; User Guide Version 9 Series. "ESRU Manual U 96/1, University of Strathclyde, Energy Systems Research Unit, Glasgow, 1996.*
4. *Manual of Green Building practices - GRIHA*

MAR 104 - Research Methodology and Statistical Analysis

Credits – 3   Sem Exam – 70 mks

OBJECTIVE – To understand a research problem and believe that innovative ideas are a key to the new world of tomorrow.

MODULE 1 - Problem Identification & Formulation –Research Question–Investigation Question –Measurement Issues – Hypothesis –Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing –Logic &

MODULE 2 – Importance of Research Design: Concept and Importance in Research –Features of a good research design –Exploratory Research Design –concept, types and uses, Descriptive Research Designs –concept,types and uses. Experimental Design: Concept of Independent & Dependent variables

MODULE 3 - Qualitative and Quantitative Research: Qualitative research –Quantitative research –Concept of measurement, causality, generalization, replication. Merging the two approaches.. Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample –Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample size.

MODULE 4 - Data Analysis: Data Preparation –Univariate analysis (frequency tables,bar charts, pie charts, percentages), Bivariate analysis –Cross tabulations and Chi-square test including testing hypothesis of association. Interpretation of Data and Paper Writing –Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish . Ethical issues related to publishing, Plagiarism and Self-Plagiarism

REFERENCES
1. *C.R. Kothari, Gaurav Garg, Research Methodology Methods and Techniques , New Age*
2. *Creswell, John W. Research design: Qualitative, quantitative, and mixed methods, approaches. Sage publications, 2013.*
3. *International Publishers, Third Edition, Ranjith Kumar, Research Methodology: A Step by step Guide for Beginners, 2nd Edition, SAGE, 2005*

MAR 181 - Basic Infrastructure Study & Analysis

Credits – 9   Viva Voce – 100 mks

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

OBJECTIVE – To identify the infrastructure required for sustainable growth and development.

MODULE 1 – Studies on social and physical urban infrastructure including power and water supply, sanitation facilities, transport and business opportunities and opportunities for social interaction and festivities through case study in an identified area.

MODULE 2 – Understanding the impact of critical infrastructure on the development of a municipal ward, tracing the history of its development process and identifying the possible guidelines for future development.
There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

MAR 201 - Elective I (Any one of the three)
Credits – 3   Sem Exam – 70 mks

A. ENVIRONMENTAL IMPACT ASSESSMENT

OBJECTIVE – To impart knowledge and skills in preparing Environmental Impact Assessment document/ reports and scrutiny of the same.

MODULE 1 - Introduction to Environment Management & EIA, EIA Procedure - Scoping & Screening and Establishing Baseline Conditions, EIA Methodologies

MODULE 2 - Impact Identification & Analysis of Alternatives through case study of large housing complex

MODULE 3 - EIA & Sustainability, EIA- Socio-Economic Impact Identification and mitigation, Analysis & Prediction -Evaluation of impact significance & Key Parameter Environmental Auditing

REFERENCES :

1. *Jain, R.K., Urban, L.V. and Stacey, G.S., Environment Impact Analysis, Von Nostrand Reinhold Company.*
2. *Lawrence, David P., Environmental Impact Assessment (Practical Solutions to Recurrent Problems), Wiley International, New Jersey.*
3. *Westman, Walter E., "Ecology, Impact Assessment and Environment Planning" John Wiley and Sons, Canada, 1985.*

B. LANDSCAPE DESIGN

OBJECTIVE – Advance the image, visibility, and understanding of the professional with client groups, public policy makers, allied professions, media, and the general public.

MODULE 1 - An outline of the chronology of development and evolution of landscape and garden design in relation to art, architecture and city planning from the earliest period to the present day: towards a comprehensive and inclusive vision of Landscape Architecture as enhancing factor in urban development. Appraisal of site factors in large scale developments with above correlation. Use of relevant software and advanced mapping technology for analysis.

MODULE 2 - Site mobilisation; Sequence of site activity, site protection measures, site implementation checklist. Landscape Engineering and water conservation; Watersheds and their characteristics, protection of natural water bodies: water retention structures, water harvesting techniques and device

MODULE 3 - Energy saving techniques in landscape engineering for planning of services and utilities.
Design parameters and certification criteria for green buildings. Evaluating energy efficient site planning and landscape development.

MODULE 4 - Design of sustainable landscape features such as bioswales, bio retention ponds etc. Estimation of costs for civil works and plantation works. City development Plans, Zonal Plans and structure plan. Development controls and their role in the conservation and creation of urban landscape.

REFERENCES

1. *Steven Strom ; Site Engineering for Landscape Architects*
2. *Larry Weaner : Garden Revolution: How Our Landscapes Can Be a source of Environmental Change*
3. *Christopher Duerksen : The Citizen's Guide to Planning (Citizens Planning Series)*

C. TRANSPORT PLANNING

OBJECTIVE **– To** explore the relationship between transport, land use and urban form and further, introduce key concepts in transportation and land use planning.

MODULE 1 - Role of transport in development; identification and analysis of problems, issues and constraints in regional and urban development - Transport and Socio-economic Activities;

MODULE 2 - Transport Planning Process, Problem, Definition, Solution , Generation, Solution and Analysis, Evaluation and Choice, Implementation, Development of Land-use Models, The Lowry Model,Application of Lowry Model.

MODULE 3 - Urban Activity Systems, Urban Movement Hierarchies, Hierarchy, capacity and geometric design elements of roads and intersections. Basic principles of Transport infrastructure design , Transport Planning Surveys and Studies, Transport Demand Modelling

REFERENCES :

1. <u>Ashish Verma</u> & T.V.Ramanayya :*Public Transport Planning and Management in Developing Countries*
2. *Sarkar Prabir Kumar , Maitri Vinay, Joshi G.J : Transportation Planning: Principles, Practices and Policies*
3. *L. R. Kadiyali : Traffic Engineering and Transport Planning*

MAR 202 - Data Analytics and digital skills for Built Environment

Credits – 3   Sem Exam – 70 mks

OBJECTIVE – The course defines the role of digital technology in the future of the city.

MODULE 1 - Introduction to Smart Urban Infrastructures and Smart Cities Smart Urban Energy Systems Smart Urban Transportation Systems

MODULE 2 - Introduction to GIS and its applications in planning exercises Turning Geographic Information into GIS data GIS data procurement Common analytical tasks Working with data- raster data, CAD data and hydrology data

MODULE 3 - Classification of regions, delineation techniques of various types of regions, Analysis of structure of nodes, hierarchy, nesting and rank size. Scalogram, sociogram, etc.;

MODULE 4 - Planning balance sheet. Threshold analysis; Input Output analysis, SWOT analysis. Methods of population forecasts and projections. Lorenz Curve, Ginni Ratio, Theil's index, ratios : urban – rural, urban concentration - metropolitan concentration

REFERENCE :

1. *Handbook on geographic information systems and digital mapping - - UNITED NATIONS PUBLICATION SALES ISBN 92-1-161-426-0*
2. *Roger, F. Tomlinson (2009). Thinking about GIS: Geographic Information System Planning for Managers, ESRI Press California.*

MAR 203 - Urban Infrastructure Planning

Credits – 3   Sem Exam – 70 mks

OBJECTIVE - The aim of this course is to understand urban issues that signify everyday urban conditions with particular emphasis on Indian urban centres and connected policy-management frameworks.

MODULE 1 - National Urban Planning-Polices and strategies - Introduction to urban management–decentralized and people led infrastructure, Quality control mechanisms. Case studies of successful and innovative urban infrastructure provisions – development, management and maintenance schemes.   Overview of Legal and statutory aspects of Planning, Town Planning Acts, Water and Sanitation, Energy consumption, Municipal wastes

MODULE 2 - Transport & environment planning and development, understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions   Technological innovations and emerging smart infrastructure networks

MODULE 3 - Social infrastructure and community life, Infrastructure and poverty, National Missions and policies on infrastructural provision, Management of infrastructural networks

REFERENCES :

1. *Saini & Mahavir (1985). 'Urban Development Planning Strategies and Techniques', Central Electric Press, Delhi. Ministry of Urban Affairs & Employment (G.O.I.), (1996).*
2. *'Urban Development Plans Formulation and Implementation Guidelines', ITPI, New Delhi.*
3. *Bhargava, G, (2001), Development of India's Urban, Rural and Regional Planning in the 21stCentury Policy Perspective, Gyan Publishing House, New Delhi*

MAR 281 - City Infrastructure Planning

Credits – 9   Viva Voce – 100 mks

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

Preparation of Strategic Urban Infrastructure Plan for a case city along with Pre-feasibility studies of various sectors / infrastructure projects/schemes of the Plan (DPR) .Students will be examining heterogeneous linear elements of the city that either already include a branch of the existing metro system or which are slated for major upgrades in public-transit infrastructure (tramway or Bus Rapid Transit), as outlined in the city's future planning agenda. The practical work in this studio begins with detailed studies to determine the existing exploitation and capitalisation of all properties along these corridors as indicated by 'hard' measures of urban form--in particular, existing and permitted F.A.R. (floor area ratio). Students shall then explore various generalised interventions capable of responding to issues and concerns brought to light through detailed analyses of the urban corridors, exploring site-development scenarios and proposing changes to planning policy as may be appropriate.

OR

This studio can address issues such as effects of climate change on urban development. Climate change is beginning to have noticeable adverse impacts on cities. Cities across the world must start to adapt to the new climates. Consequently, climate change adaptation has become an urgent issue on the policy agenda. This could also mean suggesting alternative ways and planning/design solutions to harness the destructive effects and create a path to channelize the embodied energy to greater causes.

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SEM 3

MAR 301 - Elective II (Any one of the three)
Credits – 3   Sem Exam – 70 mks

A. PROJECT MANAGEMENT

OBJECTIVE - To be capable of appreciating the construction related issues that are to be kept in mind while in the business of real estate.

MODULE 1 - Project Formulation / Planning – Methodology for project identification & formulation, detailed project report, feasibility studies, techniques of financial appraisal, payback period, IRR, DCF, NPV, CBR, financial cost – benefit analysis – economic cost benefit analysis.

MODULE 2 - Pre –Resource leveling and allocation, time – cost trade –off aspects, value engineering –construction planning – Industrialized construction and Prefabrication – Computer aided engineering.

MODULE 3 - Project Management – Planning & Control, Human Aspects – Development of project networking Critical path, PERT & CPM, Project organization, contracting, Procurement and recruitment Budget,, Fund flow statement, stabilization & finish. Organisation of project , matrix organization, task forces, project teams, monitor & control of project, Project management strategies, tools & techniques,

MODULE 4 - Classical persuasive & non- persuasive techniques. Techniques of monitoring of development works – standard oriented cost control, turnkey system, vertical production method, inventory cost control techniques & unified status, index techniques. Project monitoring – Management Information Systems, Environmental care, Safety.

REFERENCES:

1. *Project Management by Sanjiv Marwah (Author)*
2. *Project Management Core Textbook, M.R. Gopalan*
3. *Projects Planning, Analysis, Selection, Implementation, and Review – By Prasanna Chandra, Tata McGraw Hill Publications*
4. *Construction Management and Planning- By B. Sengupta and H. Guha, Tata McGraw Hill Publications.*

B. URBAN SOCIOLOGY

OBJECTIVE - It attempts to provide an awareness of the various theoretical perspectives. It also deals with the peculiar features of Third world urbanization in general and the process of urbanization in India in particular.

MODULE 1 - Introduction: Theories of Urbanism, Classical Theories of City: The City-Max Weber; Metropolis and mental life –George Simmel The Chicago School and its critics: Theories of Robert Park, Burgess, Mc Kenzie and Louis Wirth

MODULE 2 - The New Urban Sociology: Henri Lefebvre; David Harvey; Manuel Castells Employment and Joblessness in the Inner City, Race, Ethnicity, and Immigration, Housing The Poor, Social Organization and the Informal Economy.

MODULE 3 - Urban Trends in India: Culture of the shopping mall, e-governance services, Types of crime, Migration: Causes, Consequences and Reflections, The Built Environment & Social Organization, Social Networks and Social Isolation

REFERENCES :

1. *Patel, Sujata & Kushal Deb ed. 2006.Urban Studies, Delhi: Oxford University Press*
2. *James L. Spates et al. 1982. The Sociology of Cities, New York: St' Martin's Pres*
3. *Whyte, William Foote, 1993. Street Corner Society: The Social Structure of an Italian Slum. Chicago, IL: University Of Chicago Press*
4. *Ratna Naidu 1991.Old Cities, New Predicaments: A Study of HyderabadNew Delhi: Sage Publications*
5. *Amiya Kumar Das 2002. Urban Planning in India New Delhi: Rawat Publications*

C. URBAN GOVERNANCE

OBJECTIVE – Provides awareness regarding infrastructure needs and services that the ULB should provide for better living conditions. Also defines the role of the various divisions of the local municipal bodies and how they should legislate and govern.

MODULE 1- Urban Governance-Definition, concepts and components; hierarchy and structure, form of governance; Institutional and organizational framework, existing institutional and organizational setting for urban management in India;

MODULE 2 - Distribution of responsibilities ; special purpose vehicles(SPV's) in the urban sector ; significance of organizational framework; Difference between institutions and organizations; Urban Local Governance and its Reforms, Urban local governance-type, organization, power , functions, resource, state supervision control and their working; improvement trust-organizations, scope of their powers and functions and their working;

MODULE 3 - City development authorities: organizations, scope of their power and functions, resources, and their working; administrative reforms in local governance; Organisational Restructuring of Local Governments; capacity building; NGO's.

REFERENCES :

1. *A. Ghosh (ed), 2003, Urban Environment Management, ISS, Concept, New Delhi.*
2. *K.C. Sivaramakrishnan and L. Green, 1986, Metropolitan Management, The Asian Experience, OUP, New Delhi.*
3. *U.B. Singh, 1997, Urban Local Government, Rawat, Jaipur*

MAR 381 - Thesis Programming
Credits – 6   Viva Voce – 100 mks

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

It is a formal study done on a particular topic related to Urban Development. This exercise is taken up to widen and enrich the literature pertaining to a topic of research. It may focus upon cross section of literature of a topic. The material may be useful in fourth semester when the same topic with literature reviewed systematically be confined as a part of M.Arch Thesis . Topics may be from the following broad subjects:
1. Urban governance
2. Infrastructure resources
3. Building Services
4. Project Planning and monitoring
5. Landscape and site planning
6. Environmental Impact Assessment

7. Sustainable practices, etc

MAR 382 - Project formulation & Services

Credits – 9   Viva Voce – 100 mks

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

The subject would require designing project services and management. The site could be large industrial parks, IT parks, Housing condominiums, large shopping districts, hotels, etc.

MAR 383 - Summer training (8 weeks only)

Credits 3   Viva Voce – 100 mks

At the end of the semester there will be a viva voce conducted by the Institute

The students are to train with infrastructure design professionals/agencies preferably handling report work or site work or both, for large scale projects.

SEM 4

MAR 481 - Thesis

Credits - 21   Viva Voce – 500 mks

There will be three reviews conducted internally and at the end of the semester there will be a viva voce conducted by the Institute comprising of a panel with an external member.

Follow up on Thesis Programming to execute a detailed project report on a topic of discussion and culmination in a research study or a proposal for a live development project.