Course Structure

MASTERS IN ARCHITECTURE

School of Architecture, Techno India University

SEMESTER I

Sl No	Sub. Code	Subject	Credit Hours			
			L	S	P	Total
1	TIU-PAR-T101	Contemporary Architecture - Theories and Trends	3			3
2	TIU-PAR-T102	Urban Governance	2			2
3	TIU-PAR-T103	Urban Transportation	3			3
4	TIU-PAR-T104	Urban Design	3			3
5	TIU-PAR-T105	Research Methodology	3			3
6	TIU-PAR-L101	Application of Software and GIS in Architecture and Urban Science	2	1		3
7	TIU-PAR-S101	Design Studio - I	2	4		6
	Total					**23**

SEMESTER II

Sl No	Sub. Code	Subject	Credit Hours			
			L	S	P	Total
1	TIU-PAR-S102	Urban Infrastructure Planning & Design	3	1		4
2	TIU-PMA-118	Applied Statistics	3			3
3	TIU-PAR-T106	City Analytics	3	1		4
4	TIU-PAR-L102	Seminar	1	1		2
5		Elective – I *(Refer List of Electives)*				3

6		Elective – II *(Refer List of Electives)*				3
7		Elective – III *(Refer List of Electives)*				3
8	TIU-PAR-S102	Design Studio - II	2	4		6
	Total					**28**

SEMESTER III

Sl No	**Sub. Code**	**Subject**	**Credit Hours**			
			L	**S**	**P**	**Total**
1	TIU-PAR-L201	Professional Training *(Compulsory for All)*			2	2
2	TIU-PAR-S201	Thesis Stage - I *(Compulsory for All)*	2	8		10
	Option 1: Classroom and Studio Programme					
3	TIU-PAR-T201	Megastructures	2			2
4	TIU-PAR-T202	Building Technologies	2			2
5	TIU-PAR-S203	Design Studio - III	2	4		6
	Option 2: International Studio Programme					
6	TIU-PAR-S204	International Design Studio				10
	Total					**22**

SEMESTER IV

Sl No	**Sub. Code**	**Subject**	**Credit Hours**			
			L	**S**	**P**	**Total**
1		Elective – IV *(Refer List of Electives)*				3
2	TIU-PAR-S202	Thesis Stage - II	3	12		15
	Total					**18**

Summary

Semester	Semester I	Semester II	Semester III	Semester IV	**Total**
Semester-wise Total Credits Hours	**23**	**28**	**22**	**18**	**91**

LIST OF ELECTIVES

Sl No	Sub. Code	Subject Name	Credit Hours			Relative Weight (%)		
			L	S	P	Assign.	MTA	ETA
1	TIU-PAR-E001	Value Engineering	3			50	25	25
2	TIU-PAR-E002	Housing	3			50	25	25
3	TIU-PAR-E003	Landscape Architecture	1	2		50	25	25
4	TIU-PAR-E004	Urban Public Spaces and Site Planning	1	2		50	25	25
5	TIU-PAR-E005	Sustainable Urbanism	3			50	25	25
6	TIU-PAR-E006	Architecture and Urban Conservation	3			50	25	25
7	TIU-PAR-E007	Architectural Valuation	3			50	25	25
8	TIU-PAR-E008	Designing Disaster Resilient Cities	3			50	25	25
9	TIU-PAR-E009	Public Policy and Urban Management	3			50	25	25
10	TIU-PAR-E010	Urban Land Economics	3			50	25	25
11	TIU-PAR-E011	Urban and Regional Planning	3			50	25	25
12	TIU-PAR-E012	Inclusive Design in Architecture	2	1		50	25	25
13	TIU-PAR-E013	Vernacular Architecture	3			50	25	25
14	TIU-PAR-E014	Sustainable Infrastructure Project Management	3			50	25	25
15	TIU-PAR-E015	Urban Farming in Sustainable Cities	3			50	25	25
16	TIU-PAR-E016	Urban Form	2	1		50	25	25
17	TIU-PAR-E017	Applied Geographical Information System (Analytical Training)	1		2	50	25	25
18	TIU-PAR-E018	Advanced Urban Transportation	3			50	25	25

COURSE : MASTER OF ARCHITECTURE

SEMESTER I

Subject Name: Design Studio - I **(L-S-P:2-4-0)**

TIU-PAR-S101

Objective: To develop architectural design/urban design for large scale projects with a focus on environmental sustainability.

Overview:

Contemporary world architecture, related theories and trends; Modernism and international style, Bauhaus school, De Stijl movement; Architectural works and philosophies of master architects.

- Understanding of sustainability and built environment.
- Sustainable strategies and contextuality.
- Sustainable projects -case studies.
- Green Retrofitting.

Suggested Studio Exercises:

- Field studies – observational and analytical studies of important urban/ public spaces, roads; Imageability and townscape of selected areas/ settlements.
- Design evaluation/ analytical study of modern examples. Urban design proposal for improvement/ renewal/ redevelopment/ new development of an area.
- Analytical studies of sustainable practices in traditional and contemporary contexts of:
    - Low-rise buildings,
    - Medium rise buildings,
    - High rise buildings,
    - Campuses, neighbourhoods; responsive design solutions for the contexts;
    - Green retrofitting.

Review: Both Internal & External Review required

List of books

- Yeang,K., “The Green Skyscraper”, Prestel Publishing.1999
- Steele, J., “Ecological Architecture-a critical history”, Thames Hudson.2005
- Building and Construction Authority, “Existing Building Retrofit”, Singapore.2010
- Kwok, A., “The Green Studio Handbook”, Routledge. 2011
- Vassigh, S., Ozer, E. and Spiegelhalter, T., “Best Practices in Sustainable Building Design”, J. Ross Publishing. 2012
- Lynch, Kevin, "Image of the City", 1 MIT Press, 960

- Jacobs, Jane, "The Death and Life of Great American Cities", Random House, 1961
- Alexander, Christopher, "A Pattern Language", Oxford University Press, 1977
- Krier, Rob, "Urban Space, UMBAU – VERLAG, 1979
- Hall, Peter, " Cities of Tomorrow", Oxford: Blackwell, 1988
- Schulz, Norberg, "Genius Loci: Towards a phenomenology of Architecture", New York, 1979

Subject Name: Application of Software and GIS in Architecture and Planning
(L-S-P:2-0-1)

TIU-PAR-L101

Objective: To impart knowledge of computer applications in architecture.

Suggested Lab Exercises:

- Application of Revit Architecture Suite: Auto Cad 2009 and 3DS Max for design studio problems.
- Application of Building Information Modelling for a given project.
- Application of Sketchup Pouching and E-view for a given design.
- Use of Catia application.
- Intro to Primavera: Construction planning management applied to ongoing design studio project.
- Application of Design Builder and DOE2 for energy simulation modelling of one ongoing and one new project.
- Introduction to GIS application in planning / architectural design studio problem/s.
- Introduction of different GIS tool box and analytical approaches.

List of books

- Omura, G., "Mastering Revit 2009", Sybex Publication.2009
- OMura, G., "Bible 3D Max 2009", Sybex Publication.2009
- Manuals of Sketchup, Podium E-view, Catia and Primavera.2012
- Manuals of Design Builder and Energy Simulation Modelling. 2012
- Manuals M.S. Pro and Power Sim.20126.
- Manuals of MATLAB and Arc GIS.2012

Subject Name: Contemporary Architecture - Theories and Trends **(L-S-P:3-0-0)**

TIU-PAR-T101

Objective: To impart knowledge of contemporary theories and trends in architecture.

Module 1: Overview:

Contemporary world architecture, related theories and trends; Modernism and international style, Bauhaus school, De Stijl movement; Architectural works and philosophies of master architects.

Module 2: Late Modernism:

Concepts, relationships to modernism, influences, debates on ornamentation, sculptural forms, slick tech architecture, late modern space, architectural works and philosophies of late modern architects.

Module 3: Post Modernism:

Concepts, relationships to modernism, influences, double coding style, critical regionalism, neo vernacular, ad hoc urbanism, architectural works and philosophies of post-modern architects.

Module 4: Advanced Theories in Contemporary Architecture:

Deconstructivism, biommicry, blobitecture, parametric design, Möbiusstrip, trends in high rise structures, architectural works, emerging building typologies.

Module 5: Indian Modernism:

Post-independence modernist architecture; Architectural works and philosophies of modern Indian architects.

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Frampton, K., "Modern Architecture-A Critical History", Thames and Hudson.2002
- Gossel, P. and Leuthauser, G., "Architecture in the 20th Century", Vol. 1&2, Taschen.2005
- Jencks, C., Kropf, K., "Theories and Manifestoes of Contemporary Architecture", Second Edition, Wiley Academy.2005
- Gossel, P., "The A-Z of Modern Architecture", Taschen GmbH.2007
- Mehrotra, R., "Architecture in India: Since 1990", Pictor Publishing Pvt. Ltd.2011
- Smith, K., "Introducing Architectural Theory", Routledge.2012

Subject Name: Urban Governance **(L-S-P:3-0-0)**

TIU-PAR-T102

Objective: To understand all relevant planning legislation, its implementation and local self-governance applicable to urban and rural settlements.

Module 1: Overview:

Scope and objectives of planning legislation; Constitutional framework of democratic republic, fundamental rights, duties and directive principles.

Module 2: Governance in historical perspective:

Evolution and growth of planning legislation and institutional framework in India, study of important legislations.

Module 3: Existing legislative framework:

Contemporary legislation and institutional framework and its execution process, economic reforms and its consequence.

Module 4: Legislative reform:

73rd and 74th Constitutional Amendments, mechanisms for urban and rural local bodies; Municipal act, rules, regulations. Duties & responsibilities of local governments.

Module 5: Planning regulations:

Building byelaws, development controls and zoning regulations, alternative land and finance management methods, issues

Module 6: Land acquisition:

Land acquisition and related acts/laws, case studies, related court judgements, innovative land assembly.

Module 7: Planning law and act:

Other contemporary laws including Town and Country Planning Act, SEZ Act, CRZ Act; Environmental Acts.

Module 8: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Subhash C. Kashyap, "Our Constitution" , National Book Trust, India Fourth revised Edn. 2005

- “Constitutional Amendments 73rd and 74th of 1992”, Dept. of Publications, Govt. of India 1993
- “Urban and Regional Development Plans Formulation and Implementation” (URDPFI) Guidelines, TCPO Publication. (draft) 2014
- Master Plan Reports and Building bye laws of various states/ cities 2006
- “The Delhi Laws (Special Provisions) Act, 2006” Govt. of India
- Various Acts of City and Regional Development Authorities of India

Subject Name: Urban Transportation **(L-S-P:3-0-0)**

TIU-PAR-T103

Objective: To understand transportation system and traffic system in urban and rural setting.

Module 1: Overview:

Introduction to urban transportation, characteristics and problems of traffic and transportation and other urban problems.

Module 2: Roads:

Types of roads and planning standards; Road Hierachy, Urban Roads design and layout; Elements of a Road: intersections & segment; Road cross sections; Street furniture; Design for road safety, Geometric Design Basic principles

Module 3: Transportation Planning & management:

Traffic and transportation surveys; Traffic forecasts, 4 step Transport Modelling, Traffic management principles & control systems.

Module 4: Sustainable Transportation Roads and transport services in urban and rural settlement; Mass transportation in urban environment; relation of urban form and transportation; Environmental considerations. Intermodal Transport Integration, Transit Oriented Development. Designing road infrastructure for electric vehicles and futuristic sustainable cities.

Module 5: Design of Urban Roads and its role in City Cognitive Map

Application of Kevin Lynch Theory of roads as the dominant element that creates mental maps for the city. Design of paths, i.e. the streets, walkways, roads, along which we move while observing the city. Relation with the adjacent urban form & architecture, street furniture, Intersection control etc

Module 6: Sustainable Pavement Design

Principles of pavement design. Factors affecting pavement design for highways, rural & urban roads. Introduction to the concept of Sustainable Pavement Design

Module 7: Case study:

Best practices from India and abroad; New innovations and concepts.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Bohlinger, M., "Planning Traffic Management", Springer2010
- Bruton, M.J., "Introduction to Transportation Planning", Amazon Co2009

- Burton E. and Mitchell, L., “Inclusive urban design: streets for life”, Elsevier. 2006
- Tiwari G., “The Way Forward Transportation Planning and Road Safety”, IITD Publication 2003
- Kadiyali, L.R “Traffic Engineering and Transport Planning”, Khanna Publisher2007

Subject Name: Urban Design **(L-S-P:3-0-0)**

TIU-PAR-T104

Objective: To impart knowledge on various aspects, elements, concepts and principles of urban design.

Module 1: Overview:

Various aspects of urban design; relationship of urban design to architecture, planning and landscape; Evolution of professional discipline; Role and types of urban design guidance.

Module 2: Urban Form, Pattern and Spaces in History:

Review of urban forms, patterns and spaces in different periods of history viz. ancient river valley civilization, Greek, Roman, Medieval, Renaissance, Baroque, post industrial revolution period in Europe and India and their influencing factors.

Module 3: Elements of Urban Environment:

Urban form, townscape, urban spaces, streetscapes, building forms and facades, public art.

Module 4: Concepts of Urban Design:

Public perception; Imageability and townscape; Sense of place.

Module 5: Concepts in Urban Design:

Modern examples of urban settlements, town centers and urban spaces in India and foreign countries.

Modue 6: Urban Design Principles and Techniques:

Salient urban design paradigms, principles, tools and techniques.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Spreiregen, P. D., "Urban Design: Architecture of Towns & Cities", McGraw Hill.1965
- Broadbent, G., "Emerging Concepts of Urban Space Design", Van Nostrand Reinhold.1990
- Punter, J. and Carnoma, M., "The Design Dimension of Planning-Theory, Content and Best Practices for Design Policies", E & FN Spon.1997
- Cowan, R., "Urban Design Guidance by UD Group", Thomas Telford Publishing.2002

- Watson D. etal.(ed), “Time Saver Standard for Urban Design”, McGraw Hill.2003

Subject Name: Research Methodology **(L-S-P:3-0-0)**

TIU-PAR-T105

Objective: To impart knowledge about research design, methods and techniques relevant to architecture.

Module 1: Overview:

Research in architecture-its importance and scope; Areas of research and types of research in architecture; Research process-identification of problem, formulation of research questions and hypothesis, collection of evidences and data analysis; Methods of inquiry.

Module 2: Literature Review:

Need and process of literature review, style of referencing, bibliography, writing literature review.

Module 3: Research Paradigms and Strategies:

Various systems of Inquiry-Dichotomous, Continuous, Tripartite Frameworks - their ontological and epistemological assumptions and standards of quality; Overview of different research strategies relevant to research in built environment.

Module 4: Research Methods:

Qualitative; Historic-interpretive; Co-relational; Logical Argumentation methods and case studies and combined strategies -their basic assumptions; Strengths and weaknesses of different methods.

Module 5: Experimental and Simulation Research Methods:

Their basic assumptions, techniques used and strength and weaknesses.

Module 6: Tools and Techniques:

Used for collecting data (observational studies, surveys, interviews) and analyzing data (quantitative, qualitative, multivariate analysis and software applications like, SPSS, R etc) for different research methods.

Module 7: Technical report/paper writing

Module 8: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Ross, R., "Research: An Introduction", Barnes and Noble Books.1974
- Gibbs, J.F., "Urban Research Methods", (Rev. Ed.) Von Nostrand.1988

- Khanzode, V.V., “Research Methodology –Techniques and Trends”, APH Publishing.1995
- Groat, L. and Wang, D., “Architectural Research Methods”, john Wiley & Sons.2002
- Kothari, C.R., “Research Methodology –Methods and Techniques”, New Age International. 2004
- Knight, A. and Ruddock, L., “Advanced Research Methods in Built Environment”, John Wiley & Sons. 2008

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SEMESTER II

Subject Name: Design Studio - II **(L-S-P:2-4-0)**

TIU-PAR-S102

Objective: To analyze impact from urban design point of view for a large scale real-estate project with a focus on environmental sustainability.

Overview:

Contemporary world architecture, related theories and trends; Modernism and international style, Bauhaus school, De Stijl movement; Architectural works and philosophies of master architects.

- Understanding of sustainability and built environment.
- Sustainable strategies and contextuality.
- Sustainable projects -case studies.
- Green Retrofitting.

Suggested Studio Exercises:

- Analytical studies of traditional and contemporary public places
- Street design
- Riverfront development
- Urban renewal
- Sustainable urbanism and urban retrofitting in different contexts; Design Solutions for the contexts.
- Design evaluation/ analytical study of modern examples. Urban design proposal for improvement/ renewal/ redevelopment/ new real-estate development of an area.
- Analytical studies of sustainable practices in traditional and contemporary contexts of:
    - Medium rise buildings,
    - High rise buildings,
    - Neighbourhoods; responsive design solutions for the contexts;
    - Green retrofitting.

Review: Both Internal & External Review required

List of books

- Yeang,K., "The Green Skyscraper", Prestel Publishing.1999
- Steele, J., "Ecological Architecture-a critical history", Thames Hudson.2005
- Building and Construction Authority, "Existing Building Retrofit", Singapore.2010
- Kwok, A., "The Green Studio Handbook", Routledge. 2011

- Vassigh, S., Ozer, E. and Spiegelhalter, T., “Best Practices in Sustainable Building Design”, J. Ross Publishing. 2012

Subject Name: Urban Infrastructure Planning & Design **(L-S-P:3-1-0)**

TIU-PAR-S102

Objective: To understand the importance of infrastructure planning and managing appropriate development schemes.

Module 1: Overview:

Elements of infrastructure (physical, social, utilities and services), definitions, concepts, significance and importance; norms and standards.

Module 2: Transportation:

Types of transport systems, transport problems and mobility issues; Urban form and Transport patterns, land use –transport cycle; Transport planning process, environment and safety issues; principles of traffic management.

Module 3: Water and storm water management:

Sources of water, treatment and storage, transportation and distribution, quality; Storm water –rainfall data interpretation, storm water collection and disposal, water harvesting, recycling and reuse.

Module 4: Sanitation:

Points of generation, collection, treatment, disposal, grey water disposal, institutional arrangements, planning provisions and management issues.

Module 5: Solid and other wastes:

Generation, typology, quantity, collection, storage, transportation, treatment, disposal, recycling and reuse; Sustainability issues

Module 6: Power:

Sources of power procurement, distribution networks, Fire –Protections

Module 7: Social infrastructure:

Typologies, Planning for educational, health, recreational and Socio-cultural facilities. amenities for urban and rural settlements.

Module 8: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Dragan, S., "Sustainable Water Management Solutions for Large Cities", IAHS Publication.

- Tchobanoglous, G., “Integrated Solid Waste Management: Engineering Principles and Management Issues”, McGraw Hill.1993
- Goodman, A.S. and Hastak, M., “Infrastructure Planning Handbook: Planning Engineering and Economics”, New York: ASCE Press.2006
- “Solid Waste Management in Class I Cities in India”. Report of the expert Committee constituted by Hon. Supreme Court of India. 1999
- Baum, V., “Energy Planning in Developing Countries”, Australian Govt. Publishing Service. 1994
- Zaini, U. and Mogens, H., “Municipal Wastewater Management in Developing Countries”, Elsevier. 2006

Subject Name: Applied Statistics **(L-S-P:3-0-0)**

TIU-PMA-118

Objective: To understand scope of statistical application for scientific interpretation of data, predicting outcome and estimating trends in research.

Module 1: Raw data and its classification:
Discrete frequency distribution, Sturge's rule, continuous frequency distribution, cumulative frequency distribution, histogram, frequency curve, frequency polygon.

Module 2: Inferential statistics:
Descriptive and inferential statistics, probability in statistics: theories and theorems on probability, predictions and inferences with data processing, Range, Semi-in terquartile range, Mean deviation, Variance and standard deviation, effect of change of origin and scale

Module 3: Correlation and Regression:
Fundamentals of correlation and regression, comparison between descriptive and inferential statistics, theories in probability, and learning basic programming and informatics.
Data analysis with correlation and linear regression theories, Bivariate data, bivariate frequency distribution, Covariance, effect of change of origin and scale, Karl Pearson 's and Spearman 's coefficient of correlation for grouped and ungrouped data,

Module 4: Statistics in empirical research:
Analysis of variance (one way and two way classification), panning and design of experiments, estimation and hypothesis testing, analyzing errors in hypothesis testing, case study in demographics

Module 5: Hands-on experience on R, SPSS etc using a practical urban problem.

List of books

- Ross, Sheldon M., “Introduction to probability and statistics” 13 March 2009, Academic Press.

Subject Name: City Analytics **(L-S-P:3-1-0)**

TIU-PAR-T106

Objective: To impart knowledge on how software makes a difference in city design, urban management and the way we live.

Overview:

Computer programming has become increasingly important for people working with designing, planning and management of urban areas. With the advent of Information Technology & Geographical Information Systems, urban designers today can access a huge amount of smart data for analysis and process it using Urban Informatics to provide dynamic solutions to complex urban problems and even visualize or simulate future urban scenarios.

This is a hands-on course that trains students to analyze urban data, develop indicators, and create visualizations and maps using the Python programming language, open source tools, and public data. The course will first introduce the concept of Digital Cities moving on to the fundamentals of programming in Python and further into data mining, data management, mapping & visualization tools & technologies.

Module 1: Introduction to the concept of Digital Cities (Information & Communication Technolgy, Internet of things, Smart Infrastructure, Importance of data : geographic data/spatial data, government data (census data, open data, etc.); personal data (social media, quantified self data, etc.), and; Sensor data/ Big Data (transport, surveillance, CCTV, Internet of Things devices, etc.).

Module 2: Fundamentals of programming with Python and Jupyter notebooks, Cleaning, manipulating, and analyzing urban data, Visualizing data in Python with charts, graphs, and tables, Accessing public data from the web and APIs (including Twitter, Google, Census data, and the Open Data portals of cities), Developing spatial indicators and mapping urban data with open source GIS tools

Module 3: Final Project/Assignment: This will be an applied project. Students will develop an interesting research question that can be answered using the quantitative data analysis and visualization methods learnt in the course.

COURSE PREREQUISITES

Prior coursework and experience using a GIS is required. Students are not required to have prior programming experience, although it will be beneficial.

List of books

- Shi, W., “Urban Informatics”, Springer Singapore.2021

- Gibbs, J.F., “Street Computing: Urban Informatics and City Interfaces”, (Rev. Ed.) Routledge.2013
- Marcus Foth, “Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City”, IGI Global. 2008

Subject Name: Elective - I **(L-S-P:3-0-0)**

To be chosen from the list of electives offered by School of Architecture, TIU.

Subject Name: Elective - II **(L-S-P:3-0-0)**

To be chosen from the list of electives offered by School of Architecture, TIU.

Subject Name: Elective - III **(L-S-P:3-0-0)**

To be chosen from the list of electives offered by School of Architecture, TIU.

Subject Name: Seminar **(L-S-P:1-1-0)**

TIU-PAR-L102

Objective: To impart knowledge about research design, methods and techniques relevant to architecture.

Overview:

Each student will be given a term paper on any selected topic. Students will be required to give a write a term paper and present a seminar at the end of the Semester. The appointed teacher or coordinator will guide the students for preparation and deliberation of the problem.

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SEMESTER III

Subject Name: Professional Training **(L-S-P:0-0-2)**

TIU-PAR-L201

A seminar to be given to the department upon completion of internship at any of recognised architectural firm / corporate / PSU (8 weeks).

Subject Name: Thesis Stage - I **(L-S-P:2-8-0)**

TIU-PAR-S201

Objective: To impart knowledge about research design, methods and techniques relevant to Architecture/Planning/Housing/Landscape.

Overview:

Each Student and recommended supervisor(s) will be given a scope to choose an apt scale and size of ***Architectural/Planning/Housing/Landscape*** related Thesis / project.
The student must formulate the project/thesis problem and present number of seminars to freeze the aim an objectives of the thesis with supporting case studies. At the end of Semester - III, a progress report must be submitted to the supervisor and the department post a viva-voce.

Subject Name: Design Studio - III **(L-S-P:2-4-0)**

TIU-PAR-S203

Objective: To impart basic skills for preparation of Environmental Plan and Assessment and formulate Project/scheme.

Overview:

Planning and Design Studio exercises pertaining to:

- Environmental Status,
- Environmental Impact Assessment,
- Environmental Improvement/ Conservation /Safe and Healthy City

Project Formulation and Design in Computer aided platform like, GIS, Revit etc.

- Site selection, site analysis through Application of GIS and Remote Sensing
- feasibility studies, to formulate the project and design of selected area,
- Greenfield or redevelopment, development options concept for dwellings, plans and
- Layout, costing, pricing, financing, phasing, implementation and management and post occupancy estate management, financial feasibility.

Suggested Studio Exercises:

- Environmental Impact Assessment of region/city/project level
- Project formulation in urban scale pertaining to government schemes and/or privately developed
- Preparation of base and thematic maps and their correlation with data and analysis

Review: Both Internal & External Review required

List of books

- Building Byelaws, Development Control Rules (DCR) of metropolitan Cities 2002
- Urban and Regional Development Plans Formulation and Implementation" (URDPFI) Guidelines, TCPO Publication. (draft)2014
- Peter Wathern, Environmental Impact Assessment: Theory and Practice, RoutledgePublishers1990
- Betty Marriott, Environmental Impact Assessment: A Practical Guide, McGraw-Hill Publication1997

Subject Name: Megastructures **(L-S-P:2-0-0)**

TIU-PAR-T201

Objective: To understand concepts and technologies for design and construction of megastructures.

Module 1: Overview:

Evolution of Megastructures; physical planning/design considerations, novelty in materials and products in megastructures.

Module 2: Design of Megastructures:

Architectural design considerations for tallest, biggest and largest buildings; Space planning and design standards, environmental considerations, building byelaws and codes.

Module 3: Trends and Techniques:

New trends and techniques in application of structural principles, effect of various foundation settlements on the behaviour of super structure, concept of structure forms and their stability to various types of structures, RCC space frames and steel space structures and hyperboloid.

Module 4: Building Services:

Mechanical, Electrical, Firefighting and security, vertical transportation, HVAC, BAS and Parking; Codes for the services.

Module 5: Construction Process:

Construction planning and management, equipment, materials and construction techniques, prefabrication.

Module 6: Case Studies:

Types of megastructures across the globe.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Viswanath, H. R., Tolloczko J.J.A. and Clarke J.N., "Multi-purpose High Rise Towers and Tall Buildings", Taylor & Francis. 1997
- Lawarance, W. C. L. and Daniel, C.W.H, "Planning Buildings for a High Rise Environment", Hong Kong University Press. 2000
- Lin, C. F., "Construction Technology for Tall Buildings", Singapore University Press. 2001
- International Building Code 2009, International Code Council. 2009
- Mitchell, S. K., "Megastructures: The Tallest Buildings", Gareth Stevens. 2009

- Graham, I., “Megastructures: Tallest, Largest, Biggest, Deepest”, Firefly Books Limited. 2012

Subject Name: Building Technologies **(L-S-P:2-0-0)**

TIU-PAR-T202

Objective: To impart knowledge about the advanced building technologies.

Module 1: Overview:

Building Technologies - Structure, material, design communication, management, maintenance.

Module 2: Design of Megastructures:

Structural Systems: Categories, efficiency, new forms; Advancement and selection of material; Case studies.

Module 3: Intelligent Buildings:

Intelligent Building concept; Technologies- microprocessor, sensors and actuators; BAS; Building Management System- integration of access control, fire security, thermal comfort, daylight and artificial light, HVAC, vertical circulation-lift, escalators.

Module 4: Project Management and Maintainability:

Project management; Strategies and advancement; BIM, Lean construction- Toyota Production System, Just-in-time, value and waste; Maintenance of building elements; Facility Management.

Module 5: Sustainable Technologies and Retrofitting:

Building infrastructure technologies; Integration of passive and active strategies and technologies, Retrofitting- Functional, structural and seismic, energy retrofit; Case studies.

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Salvadori, M. and Heller, R. A., "Structure in Architecture", Prentice Hall. 1986
- Wang, S., "Intelligent Buildings and Building Automation", Spon Press. 2009
- Chew, Y. L. M., "Maintainability of Facilities: For Building Professionals", World Scientific Publishing Company. 2010
- Forbes, L., "Modern Construction: Lean Project Delivery and Integrated Practices", CRC Press. 2010
- Syed A., "Advanced Building Technologies for Sustainability", John Wiley and Sons. 2012

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SEMESTER IV

Subject Name: Thesis Stage - II **(L-S-P:3-12-0)**

TIU-PAR-S202

Objective: To impart knowledge about research design, methods and techniques relevant to Architecture/Planning/Housing/Landscape.

Overview:

Each Student and recommended supervisor(s) will be given a full semester to continue from Semester – III and complete the ***Architectural/Planning/Housing/Landscape*** related Thesis / project within Semester - IV.

The student must be able to highlight on analytical skill and delineate a research oriented apt Post Graduate Thesis. There will be number of seminars to review the progress of the student which will be evaluated by a Board of Examiners consisting of the Supervisor(s), panel members and External Examiner. The Evaluation of the Thesis / Project will be followed by a viva-voce in front of all faculty members and other Post-Graduate students.

Subject Name: Elective - IV **(L-S-P:3-0-0)**

To be chosen from the list of electives (other than Elective – I, Elective – II and Elective – III chosen in Semester II) offered by School of Architecture, TIU.

LIST OF ELECTIVES

Sl No	Sub. Code	Subject Name	Credit Hours			Relative Weight (%)		
			L	S	P	Assign.	MTA	ETA
1	TIU-PAR-E001	Value Engineering	3			50	25	25
2	TIU-PAR-E002	Urban Housing	3			50	25	25
3	TIU-PAR-E003	Landscape Architecture	1	2		50	25	25
4	TIU-PAR-E004	Urban Public Spaces and Site Planning	1	2		50	25	25
5	TIU-PAR-E005	Sustainable Urbanism	3			50	25	25
6	TIU-PAR-E006	Architecture and Urban Conservation	3			50	25	25
7	TIU-PAR-E007	Architectural Valuation	3			50	25	25
8	TIU-PAR-E008	Designing Disaster Resilient Cities	3			50	25	25
9	TIU-PAR-E009	Public Policy and Urban Management	3			50	25	25
10	TIU-PAR-E010	Urban Land Economics	3			50	25	25
11	TIU-PAR-E011	Urban and Regional Planning	3			50	25	25
12	TIU-PAR-E012	Inclusive Design in Architecture	2	1		50	25	25
13	TIU-PAR-E013	Vernacular Architecture	3			50	25	25
14	TIU-PAR-E014	Sustainable Infrastructure Project Management	3			50	25	25
15	TIU-PAR-E015	Urban Farming in Sustainable Cities	3			50	25	25
16	TIU-PAR-E016	Urban Form	2	1		50	25	25
17	TIU-PAR-E017	Applied Geographical Information System (Analytical Training)	1		2	50	25	25

18	TIU-PAR-E018	Advanced Urban Transportation	3			50	25	25

Subject Name: Value Engineering **(L-S-P:3-0-0)**

TIU-PAR-E001

Objective: To impart knowledge on the concept of Value Engineering in the Construction Industry and its relevance project feasibility. To learn to perform "function analysis" for buildings and civil projects and understand the appropriate time to apply VE for building design projects

Overview

The practice of value engineering has become a significant factor in the construction industry during the past five decades. To value engineer a product or an item is to examine carefully its components in relation to their respective performance. Alternatives are generated to enhance functionality and reduce cost.

Module 1: Introduction to the concept of Value Engineering. The definition and methodology, approach & phases

Module 2: Standards used in Value Engineering, Laws requiring VE in government projects

Module 3: Techniques of VE such as: Function Analysis, Value Models such as Cost, Quality, Risk, Group Creativity, Life Cycle Costing Technique.

Module 4: Value Engineering in Architecture: Defining Design Objectives, Scaling Design Objectives, Weighing Design Objectives, Evaluation of Alternatives. Case histories: buildings, roads, etc, Certification Requirements

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Lawrence D. Miles, Techniques of Value Analysis and Engineering, MCGraw-Hill Book Company
- John H. Fasal, Practical Value analysis Methods, Hayden Book Company
- Donald E. Parker, Value Engineering Theory, Lawrence D. Miles Value Foundation
- Fallon, Carlos, Value Analysis, Lawrence D. Miles Value Foundation.
- Gage E.L., Value Analysis, McGraw-Hill Book Company
- Heller, Edward D., Value Management: Value Engineering and Cost Reduction, Addison-Wesley
- Mudge, Arthur E., Value Engineering, 1981, Society of American Value Engineers.
- Succesful Program Management, Sharpening The Competitive Edge, Value Engineering Part II, SAVE
- Innovative Change, 101 Case Histories, Value Engineering Part III, SAVE

Subject Name: Urban Housing **(L-S-P:3-0-0)**

TIU-PAR-E002

Objective: To understand the basics of housing policy, strategy, legal and economic dimensions and their implications in planning.

Module 1: Overview:

Importance, need, problems and issues in housing.

Module 2: Policy and Strategy:

Housing policy, existing strategy and programs; Chronological evolution of National and state housing; Contemporary housing programs.

Module 3: Housing Finance and legislation:

Laws and acts on housing, development controls and building regulations; Housing finance and its importance; Financing options.

Module 4: Cooperative housing:

Concept, evolution, structure of cooperative housing.

Module 5: Industrialised mass housing:

Modular and dimensional coordination, open and closed system, linear, panel and box system, mass customised home, future of mass housing.

Module 6: Affordable, low income and informal housing:

Concept and issues of affordable housing; Slums and squatter typology; Improvement models, rental housing.

Module 7: Special housing:

Housing for hilly areas, disasters prone areas, rehabilitation, single/aged persons, working persons; Night shelters, service apartments

Module 8: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Balaji V. & Rajmanohar, "Housing Sector in India; Issues, Opportunities and Challenges", ICFAI University Press. 2008
- Christian Schittich(ed), "High Density Housing; Concepts, Planning, Construction", Birkhauser. 2004
- French H., "Key Urban Housing of the Twentieth Century", Lawrence King2008
- Reeves P., "Introduction to Social Housing", Elsevier.2005
- Davis S., "The Architecture of Affordable Housing", University of California Press. 1995

- National Housing and Habitat Policies, 1998, 2007 (urban), Govt of India1998,2007

Subject Name: Landscape Architecture **(L-S-P:3-0-0)**

TIU-PAR-E003

Objectives: To appreciate the elements and resources of landscape for design and function of landscaped areas in local & regional scale and evaluate its performance.

Module 1: Elements and resources in landscape architecture

Natural elements and resources; vegetation types and significance, planting design for specific areas, horticulture and arboriculture; topography, understanding contour and its characteristics, interpolation and representation, grading and alignment, water body and feature, geology, hydrology, irrigation and drainage system. Manmade elements and resources in landscape architecture; degree of human intervention, landscape features, structures and furniture, public utilities.

Module 2: Landscape in public realm: Landscape as Infrastructure

Public utilities and amenities, art and architecture in public realm and outdoor public spaces.

Contemporary landscape designs and evaluation of performance - city parks and playgrounds, public spaces

Open spaces categories and characteristics in regional level

Module 3: Landscape and environment: Systemic Thinking & Ecological Process

Environmental design with landscape resources, land as resource and its significance - open space, green breathing space, green belts and buffers, wetlands, water bodies, roads, parks and playgrounds, wasteland management.

Landscape decisions apt for future and sustainable built environment

Urban Tree Management Plan: Case Studies

Module 4: Economics in landscape:

Cost-benefit analysis of planting vegetation, land preparation, specification and estimation of landscape elements as per Government schedules for tendering purpose.

Module 5: Historic landscape

Conservation and restoration of landscaped areas and open spaces in historical precincts.

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Time-saver standards for LANDSCAPE ARCHITECTURE / Dines & Harris / McGraw-Hill
- Landscape Detailing Vol. I / M. Little wood / CBS
- Landscape Detailing Vol. II / M. Little wood / CBS
- Landscape Design: A Cultural and Architectural History, by Elizabeth Barlow Rogers, Harry N. Abrams; First Edition (1 November 2001)
- A Clearing in The Distance: Frederick Law Olmsted and America in the 19th Century, by Witold Rybczynski, Scribner; Illustrated edition (July 5, 2000)
- The Architecture of Trees, by Cesare Leonardi, Princeton Architectural Press; Illustrated edition (March 26, 2019)
- Cities and Canopies: Trees in Indian Cities by Seema Mundoli, Penguin Viking (15 May 2019)
- Thinking about Landscape Architecture: Principles of a Design Profession for the 21st Century, by Bruce Sharky, Published February 8, 2016 by Routledge
- Design on the Land – The Development of Landscape Architecture (Belknap Press), by Norman T Newton, Harvard University Press; Illustrated edition (1 July 1974)
- Constructing Landscape – Materials, Techniques, Structural Components, by Astrid Zimmermann, Published on Oct 30, 2011
- Design with Nature (Wiley Series in Sustainable Design), by Ian L McHarg, Wiley; 1st edition (28 March 1995)
- Principles of Ecological Landscape Design, by Travis Beck, Island Press; 2nd None ed. edition (February 1, 2013)
- Landscape Ecology, by Richard Townsend Turner Forman, Wiley; 1st edition (February 10, 1986)
- The Landscape Urbanism Reader, by Charles Waldheim, Princeton Architectural Press; 1st edition (July 21, 2006)

Subject Name: Urban Public Spaces and Site Planning **(L-S-P:3-0-0)**

TIU-PAR-E004

Objective: To impart understanding of urban public spaces in different context.

Module 1: Overview:

The need and socio-cultural economic and environmental relevance of Urban Public Spaces focusing on stipulated protocol of post-pandemic protocol.

Module 2: History of Urban Public Spaces:

Urban public spaces in traditional and historical settlements.

Module 3: Types of Urban Spaces:

Classification based on functions, morphological characteristics etc.; Examples.

Module 4: Case Studies:

Examples of important public spaces in India and abroad in contexts of small, medium and large settlements in plains and hills.

Module 5: Public Spaces in Contemporary Indian Cities:

Characteristics, problems and issues.

Module 6: Place Making:

Concept; Sense of Place; Guiding principles; Social-distancing guidelines and its application, Case examples.

Module 7: Public Space Management:

Need and different approaches to public space management in post-pandemic situation. Crowd management and social bubble

Module 8: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Tucker, P., "Town and Space", Columbia University Press. 1959
- Broadbent, G., "Emerging Concepts in Urban Space Design", Van Nostrand Reinhold. 1995
- Gehl, J. and Gemzee, L., "Public Spaces, Public Life, Copenhagen", The Royal Danish Academy. 1996
- Department of Environment and Association of Town Centre Managers. "Managing Urban Spaces in Town Centres: Good Practice Guide", Stationery Office. 1997

- Carnova, M., “Public Places – Urban Spaces: A Guide to Urban Design”, Architectural Press. 2003
- Krier, R., “Town Spaces”, Birkhauser Publishers for Architecture. 2003.

Subject Name: Sustainable Urbanism **(L-S-P:3-0-0)**

TIU-PAR-E005

Objective: To understand functioning of urban ecosystems and ecosystem services, application of relevant ecological design & planning principles towards development of sustainable/ liveable cities and ensure overall wellbeing & quality of life.

Module 1: Overview:

Fundamental concept & definition of Sustainability, 4 pillars of sustainability. Concept of Sustainable Community & their practices. Importance of the United Nations 17 Sustainable Development Goals (SDGs), Kyoto Protocol & the Paris Agreement.

Module 2: Principles of Sustainable Urban Development:

Neighbourhood concept, walkable cities, mixed used planning, high rise high density development, compact cities, transit oriented development, importance of green & blue infrastructure, ecological design & planning, urban landscape design, importance of energy conservation, energy efficiency & renewable energy sources, climate responsiveness, disaster preparedness & resilience in city design.

Module 3: Ecological Design Principles:

Definition of Urban Ecology, Ecological Planning. Definition of Urban Ecosystem & ecosystem services. Concept of Ecological Footprint, Carbon Footprint, Bio Capacity, Carbon Trading, Biophilic Design. Carbon Sequestration & Carbon Sinks.

Module 4: Climate responsiveness

Urban micro-climate and their role in the global climate. Greenhouse Gases & Global Warming, Carbon Sequestrations, Carbon Sinks, Greenhouse Gas Protocols, Intergovernmental Panel on Climate Change (IPCC) guidelines. Importance of the natural water cycles, carbon cycles etc and the role of human interventions in these cycles and man-made disasters

Module 5: Biodiversity Conservation:

Concept and role of urban biodiversity, threat to urban biodiversity. Ecological pyramids, energy flows and productivity in eco-system, Biodiversity and ecological equilibrium. Principles of biodiversity conservation.

Module 6: Performance Indicators

Gross Domestic Product (GDP), Criticisms of GDP, Happiness index, Sustainability index, human development index etc. Performance evaluating orgaizations.

Module 7: Role of Urban Design in Sustainable Urban Development:

Role of urban design in creating liveable, sustainable & happier cities, urban design in prevention of crimes, social inclusiveness & quality of life improvement. Case studies & examples.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Odum E.P. and Barrett G.W, "Fundamentals of Ecology" (fifth ed.), Cengage Learning publisher Thomson Asia Pvt. Ltd, Singapore 2005
- Paolo, S; "Arcology: The City in the Image of Man"; Revised Edn., MIT Press 2001
- Register,R; "Eco cities: Building Cities in Balance with Nature", New Society Publishers 2006
- Todd, N.J, and Todd,J; " Principles of Ecological Designs", North Atlantic Book 2004
- Oke, T.R., "Boundary Layer Climates", Routledge. 1987
- Bonan, G., "Ecological Climatology", Cambridge University Press 2002
- Montgomery , Charles., " Happy City: Transforming Our Lives Through Urban Design", Penguin Books Limited, 2013

Subject Name: Architecture and Urban Conservation **(L-S-P:3-0-0)**

TIU-PAR-E006

Objective: To enable the students to address appropriately challenges confronting historic cities, natural and built heritage, and the cultural resource base.

Module 1: Overview:

Understanding conservation; Preservation and restoration; Socio-cultural-economic and environmental significance of conservation; Various aspects of built and natural heritage; Conservation practice; Glossary- understanding redevelopment, revitalization, regeneration, rehabilitation and renewal.

Module 2: History of Conservation Movement:

Evolution of architectural and urban conservation; Restoration of historic contexts; Salient early examples of conservation of building and sites in Italy, UK and other countries.

Module 3: Basic Principles of Conservation and Degrees of Interventions:

Conservation principles; Conservation conventions and practices adopted at International, National and local levels for heritage buildings, sites and cities; Charters from Venice to Mexico.

Module 4: Architectural Conservation:

Research, documentation, analysis and interpretations related to historic buildings and sites; Technical aspects covering traditional building materials; Structural repairs, maintenance and upgradation of historic structures.

Module 5: Urban Conservation:

Heritage development within the context of continuity and change; Study of context and processes of urban conservation projects in India and other countries; Critical regionalism; Conservation policies, laws and professional norms; Cultural heritage strategies in the context of urban development.

Module 6: Conservation of Cultural Heritage:

Forms of cultural heritage; Crafts, traditions and their role in conservation; Cultural landscapes in conservation; Culture based planning; Creative cities concept; Selected examples of cultural heritage strategies for conservation.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Cohen, N., "Urban Conservation", MIT Press. 1999

- Jokilehto, J., “History of Architectural Conservation (Conservation and Museology)”, Routledge. 2002
- Fielden, B. “Conservation of Historic Buildings”, Architectural Press. 2003
- Orbasli, A., “Architectural Conservation: Principles and Practice”, Wiley Blackwell. 2007
- Croci, J., “The Conservation and Structural Restoration of Architecture Heritage: Theory and Practice”, Computational Mechanics Publications. 2008
- Aygen, Z., "International Heritage and Historic Building Conservation: Saving the World's Past", Routledge. 2012

Subject Name: Architectural Valuation **(L-S-P:3-0-0)**

TIU-PAR-E007

Objective: To understand the technique of estimation or determining the fair price or value of property such as building, a factory, other engineering structures of various types, land etc.

Module 1: Overview:

Elements of economics- Functions of utility, demand, production, cost and profit; Land economics- concept, scope and objectives; Levels of decision making.

Module 2: Financial Analysis:

Times values of money; Financing mechanism; Concepts and factors governing cost of capital; Risk and return.

Module 3: Demand Analysis:

Concept of Demand forecasting and its common methods - Delphi, Trend projection

and Exponential; Uncertainties of demand forecasting.

Module 4: Analysis of Projects:

Project constraints; Project analysis and Ranking; Introduction to project appraisal and feasibility study.

Module 5: Concept of Valuation and Measurement of Depreciation:

Concept and purpose of valuation; Function of a Valuer; Concepts of value and cost and its different types; Characteristics of an ideal investment; Annuity, Sinking fund and Year‘s purchase; Appreciation, Depreciation, Obsolescence and Amortization; Process and types of depreciation calculation.

Module 6: Techniques of Valuation for Land and property:

Rental method, direct comparison method, profit based method, development method, land and building method.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Prasanna Chandra, ―Projects: Planning, Analysis, Selection, Implementation and Review‖; Tata Mc-Graw Hill Publishing Company Limited; ISBN 0-07-462049-5
- Baumol, ―Linear Programming‖;Tata Mc-Graw Hill Publishing Company Limited; ISBN 0-07-462049-5
- Hamdy H. Taha, ―Operations Research: an Introduction‖; Prentice Hall of India Private Limited - ISBN 81-203-1222-8

- M. Chakraborty, ―Estimating, Costing, Specification and Valuation in Civil Engineering‖; Published by the author
- BK Sengupta, Somnath Sen; ITPI Reading Journal; ‖Land Economics

Subject Name: Designing Disaster Resilient Cities **(L-S-P:3-0-0)**

TIU-PAR-E008

Objective: To understand causes and consequences for urban risks and disaster and to understand principles for designing cities with disaster preparedness and disaster resilience.

Module 1: Overview:

Types of Natural and man-made disasters, meaning, factors and significance, causes and effects, global and local disaster profile, risks, vulnerability, hazard.

Module 2: Integrating disaster preparedness and resilience

Difference between disaster preparedness, disaster management & disaster resilience. Disaster Assessment Tools, Use of Smart Technology (ICT Infrastructure), Remote Sensing & Geographic Information System for Disaster Prediction & Preparedness. Vulnerability analysis, Vulnerability atlas. International & National standards on Community Resilience & disaster management. Strategies for disaster resilience.

Module 3: Incidence response and mitigation:

Disaster mitigation / preparedness and response; structural and non-structural interventions, action plans and procedures, training issues

Module 4: Disaster Resistant Architecture:

Disaster resistant construction practices and codes, engineered and non-engineered structures, preparedness for climate change, architectural and structural requirement in the design of buildings, case studies

Module 5: Institutional role and responsibilities:

Role of national and state level organisations and Urban Local Bodies for urban risk and disaster preparedness. Shared responsibilities between government, emergency services, communities and individuals.

Module 6: Role of urban planning & design for Disaster prevention & resilience: land use planning, peri urban agriculture, urban watershed management, runoff management, building materials & construction technology, smart infrastructure & technology.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Fabrice G. Renaud, Karen Sudmeier-Rieux and Marisol Estrella, "The Role of Ecosystems in Disaster Risk Reduction", United Nations University Press 2013
- K. J. Anandha Kumar & Ajinder Walia, "India Disaster Report 2012", NIDM 2013

- Bandyopadhyay C, “Training Module on Urban Risk Mitigation”, NIDM 2013
- Jain S K, Murty C V R, and Rai D C, “Engineering Response to Hazards of Terrorism”, National Information Centre of Earthquake Engineering, Kanpur 2003

Subject Name: Public Policy and Urban Management **(L-S-P:3-0-0)**

TIU-PAR-E009

Objective: To understand basics of public policy and its interrelation with urban management.

Module 1: Nature and constitution of public policy:

Nature of public problems, planning as a public issue, policy analysis and process, limitations in public and private Sector.

Module 2: Public policy analysis and strategic policy planning:

Overview of policy process, models, policy initiation; Strategic decisions and evaluation, strategic leadership.

Module 3: Public policy & urban management:

Urban policy, energy policy, transportation policy, policy on climate change & action, E-governance, transparency, accountability, land, environment, health, water and other policies; Integration and disintegration of policies, Frequency and commitments, global commitments

Module 4: Urban management:

Components of urban management, powers and responsibility of ULBs for urban management, urban reform, managing municipal infrastructure and services, development of systems and processes, peoples interface

Module 5: Role of city managers:

Councillors as city managers, role and competencies of elected representatives; Involvement of people in city management, best practices, peer experiences and continuous learning, training and capacity building

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Urban Management Programme 1997-2001, UN-HABITAT 2001
- Y. V. Reddy, "Economic Policies and India's Reform Agenda: New Thinking 1st Edition (Hardcover)" , Orient 2003
- Karen Coelho, Lalitha Kamath , M. Vijayabaskar, Participolis, "Consent and Contention in Neoliberal Urban India (Cities and the Urban Imperative)", Routledge 2013
- Sivaramakrishnan. K C, "Re-Visioning Indian Cities", Sage Publications 2011

Subject Name: Urban Land Economics **(L-S-P:3-0-0)**

TIU-PAR-E010

Objective: To understand basic concepts of economic relationship of land and real estate development and management.

Module 1: Overview:

Land and land use, demand forecasting, factors affecting land supply and demand; Market & financial instruments.

Module 2: Supply management:

Property rights, user and exchange rights, regulation in land markets; Social justice and land distribution; Master plan, zoning and other planning regulations and their impact on supply; Land management techniques

Module 3: Demand management:

Income elasticity of land, business cycles and its impact on demand for land; Preferential dynamics; Physical, fiscal, financial and legal incentives for land dynamics; Big scale investments and its effect on land

Module 4: Introduction to real estate:

Definition, principles of real estate value concepts, real property ownership, leasing succession, methods of sale/ purchase; Real estate investment and portfolio management, FDI, role of NRIs and PIOs

Module 5: Land pricing and real estate markets:

Land valuation techniques, land pricing, subsidies, auctions; type of development, land price index; Market conditions; Real estate regulations, land Information System (LIS), land records

Module 6: Case study:

Real estate project formulation

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Card R, Mardoch J, Mardock S, "Real Estate Management Law", OUP Oxford 2001
- "Sustainable Land Management: Challenges, Opportunities, and Trade-offs", World Bank Publications 2006
- CREDAI, resources on all relevant court judgements
- Shivramkrishnan K C, "Revisioning Indian Cities", SAGE 2011
- Banerjee D. N, "Principles and Practice in valuation", Eastern Law House 1998

Subject Name: Urban and Regional Planning Process **(L-S-P:3-0-0)**

TIU-PAR-E011

Objective: To understand the basic concepts of regions, regional development issues, various theories and methods, and overall process of regional planning.

Module 1: Overview:

Planning Process and levels: Comprehensive planning; Planning as interdisciplinary process; Public participatory planning; Techniques of gaming and simulation; Integrated planning and development at various levels.

Module 2: Town Planning:

Introduction to town planning, Planning terminologies, evolution of cities and town planning practice; Survey methods: Planning surveys, data bank, data processing; Demographic data and presentation techniques, correlation between spatial and non-spatial data

Module 3: Urban theories and models:

Overview of Theories: Sector, multiple nuclei, concentric zone, garden city, central place, growth pole; Contemporary urban and spatial models.

Module 4: Techniques of urban planning:

Identification of planning problems; Future growth trends; Various techniques for development and redevelopment; Appraisal of proposals Definition and delineation of region, need for regional planning.

Module 5: Regional growth:

Regional long run growth, aggregate growth models, growth from inside and outside, economic models, industrial structure analysis.

Module 6: Regional economics:

Economics of regional development; creative economy, regional analysis; Five year plans and their impacts in urban/rural system.

Module 7: Regional inequality:

Regional imbalance and inequalities in India, development of backward areas, decentralized planning; Multilevel planning.

Module 8: Regional analysis:

Location analysis, leading industries and propulsive firms, polarization effects and agglomeration economies, network analysis, spread effects, and backwash effects.

Module 9: Regional plan in India:

Planning in India an overview; Development Programs in urban and rural systems; Case Studies.

Module 10: Metropolitan planning:

City and metropolitan planning, trends in urban growth and urbanization in India, Comprehensive regional planning,

Module 11: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Unaeghu, G. C., "Issues in Urban and Regional Planning", Washington House. 2005
- Glasson, J., "An Introduction to Regional Planning" Rev. Ed. Routledge. 1995
- Calthorpe P. and Fulton, W.B., "The Regional City: Planning for the End of Sprawl", Island Press. 2001
- Hall, P., "Urban and Regional Planning", 4th Ed. Routledge. 2002
- Regional Plan-2021-NCR/11th Five Year Plan, Govt. of India. 2007
- Urban and Regional Development Plans Formulation and Implementation", (URDPFI) Guidelines, ITPI Publication. (draft), 2014

Subject Name: Inclusive Design in Architecture **(L-S-P:3-0-0)**

TIU-PAR-E012

Objective: To impart a sense for inclusive design through development of human centric approach.

Module 1: Understanding Disability:

Definitions; Types; Models of disablement (WHO); National and international disability policies, American Disability Act (ADA), UN Convention for Rights of Persons with Disabilities (UNCRPD), persons with disabilities act, India; Biwako millennium framework; Sensitization on disabling experiences.

Module 2: Theory of Universal Design:

Barrier free environment; Trans-generational design; Physical and social barriers; Principles of universal design and applications in built environments; Assistive technology; Inclusive design strategies; Best Practices.

Module 3: Universal Design for India:

Universal design Indian principles and their applications in diverse socio-cultural environments, rural and low income contexts.

Module 4: Access Audits:

Role of access audits; Designing access audit toolkits; Access audit check lists; Conducting access audits on live sites; Access audit report preparation.

Module 5: Accessibility Standards and Design Guidelines:

Accessibility codes of various architectural and design elements like parking, entrance, ramps, toilets, signage, staircase, corridors, etc.; Review of national & international accessibility codes & guidelines.

Module 6: Research Methods in Accessibility Planning:

Ethnographic research methods; Trace Study; Precedent analysis; Evidence based research methods; Reliability and validity; Scaling techniques; Usability Rating Scale (URS), Functional Independence Measure (FIM), Functional Performance Measure (FPM); Analysis.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Steinfeld, E. and Danford, G. (Eds.), "Enabling Environments – Measuring the Impact of environments" Spon Press. 1999
- Imrie, R. and Hall, P., "Inclusive Design - designing and developing accessible environments", Spon Press. 2001

- Barnes, C., Mercer, G. and Shakespeare, T., “Exploring Disability – A Sociological Introduction”, Polity Press. 2003
- Bednar, M. J., “Barrier Free Environments”, Dowden, Hutchinson & Ross. 2007
- Preiser, W. F. E., “Universal Design Hand Book”, Ostroff. 2011
- Steinfeld, E. and Maisel, J., “Universal Design: Designing Inclusive Environments”, John Wiley & Sons. 2012

Subject Name: Vernacular Architecture **(L-S-P:3-0-0)**

TIU-PAR-E013

Objective: To develop capacity to understand and appreciate vernacular architecture.

Module 1: Overview:

Definition and characteristics; Vernacular architecture and traditional architecture.

Module 2: Factors Influencing Vernacular Architecture:

Evolution of development of shelter form and identity; Physiography, ecology, culture and vernacular architecture; Difference in rural and urban vernacular architecture.

Module 3: Case Studies:

Examples covering settlement pattern, architectural form and construction details of global and Indian vernacular architecture.

Module 4: Contemporary Case Studies:

Contemporary examples addressing social and cultural needs and utilizing local technology and materials.

Module 5: Vernacular Architecture in 21st Century:

Technological innovation in vernacular architecture; Debates and discussions

Module 6: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Rudfosky, B., "Architecture without Architects", University of New Mesvilo Press. 1964
- Wells, C., "Perspectives in Vernacular Architecture", University of Missouri Press. 2007
- 3 Oliver, P., "Encyclopaedia of Vernacular Architecture of the World", Cambridge University Press. 1997
- Cooper, G. and Dawson, B., "Traditional Building of India", Thames and Hudson. 1998
- Glassie, H. H., "Vernacular Architecture", Indiana University Press. 2000.

Subject Name: Construction Project Management **(L-S-P:3-0-0)**

TIU-PAR-E014

Objective: To provide exposure to principles of sustainability in infrastructure construction project management.

Module 1: Overview:

Definition of Project, Program & Portfolio, Objectives of Project Management; project life cycle, Project management process, stakeholders in project management, Role and responsibilities of project manager, Role of Project Management Consultants, Enterprise Resource Planning (ERP), Project Scheduling.

Module 3: Project Evaluation, Implementation and Monitoring:

Project Feasibility Assessment, Social cost benefit analysis**,** Environment impact assessment, Detailed Project Reports, Project Planning & Scheduling, PERT, CPM, MS. Project software, Tenders, Bidding & Award of Contracts, Project Implementation & Monitoring, Quality Assurance, and Quality Control & Quality Management. Progress Reports, Public Private Partnership

Module 4: Project Risk Assessment & Mitigation

Types of Risks, Risk Assessment Tools, Disaster preparedness, Risk Mitigation Plan, Case studies of Infrastructure Project Management success & failure.

Module 5: Regulatory Frameworks & Guidelines:

Contracts Act; Labour Regulations; Arbitration act; Developers bill; Environmental Management Plan (EMP); ISI standards and its application to Indian context.

Module 6: Sustainability Approach in Project Management:

Sustainable building materials & construction technology, Ecological and social responsibility of stakeholders, Profile of a sustainable project manager, reducing carbon footprint, environment sensitivity, use of information technology in project management, good practices for wildlife conservation during construction process, rehabilitation after construction process, afforestation & corporate social responsibility

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Lock, D., "Project Management in Construction", Gower Publishing Ltd. 2004
- Peurifoy, R. L., Ledbetter, W. B. and Schexnayder, C., "Construction Planning, Equipment and Methods" McGraw Hill. 2006
- Sankar, S. K. and Saraswati, S., "Construction Technology", Oxford University Press. 2008

- Chandra, P., “Projects Planning, Analysis, Financing, Implementation & Review” Tata McGraw Hill. 2009
- Plotnick, F. L., O'Brien, J. J., “CPM in Construction Management”, McGraw-Hill Professional. 2010
- The Charter ed Institute of Building, “Code of Practice for Project Management for Construction and Development”, Wiley-Blackwell. 2010

Subject Name: Urban Farming in Sustainable Cities **(L-S-P:3-0-0)**

TIU-PAR-E015

Objective: To impart knowledge on the importance of urban & peri urban agriculture for Sustainable Development & City Resilience and study the technologies and practices associated with it.

Module 1: Introduction to Urban Farming:

The concept of urban farming, building blocks of urban farming, food security, types of urban farming, direct & indirect stakeholders of urban farming

Module 2: History & trends in urban farming:

Urban farming in Mumbai and New York City and Description of Methodology, Major Developments in Mumbai and New York City's Urban Agriculture Movements from 1800-Present 21, Urban Agriculture Today, Overview of Resources, Goals, and Challenges

Module 3: Urban Farming & City Resilience:

Role of urban agriculture in urban food security, public health, building social capital, and promoting circular economies.

Module 4: Sustainable Farming Practices:

Sustainable ways of farming, Whole farm planning, Land Management programs, Natural farming, Organic farming, Technology & Techniques in terrace farming, Permaculture, No Dig techniques, Biodynamics, Soil, Water, Land management, Plant Management, Financial Sustainability.

Module 5: Permaculture:

Permaculture principles, Natural Systems, Zone & Sector Planning, Permaculture Techniques & Technologies, Plants & Animals in Permaculture, Preparing the plan.

Module 6: Green walls & Roofs:

Challenges Within Urban Gardens, Scope and Nature of Roof and Vertical Gardens, Construction Functional and Appropriate Vertical and Roof Gardens, Climbing Plants and Structures for climbing, Plants Suited to Roof and Vertical Gardens, Adaptations for Other Plants in Roof and Vertical Gardens, Container Growing, Maintenance –watering, pest control, Applications/Landscaping –Roof Gardens, Vertical gardens, Balcony Gardens.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Ward Thomas, "Urban Farming: Sustainable Living in Your Backyard, in Your Community, and in the World"
- Salle, Janine de la and Holland,Mark . Agricultural Urbanism, Handbook for Building Sustainable Food Systems in 21st Century Cities, Libri Publishing, 2010
- Carpenter Novella. Farm City: The Education of an Urban Farmer, Penguin Press, 2009

Subject Name: Urban Form **(L-S-P:2-1-0)**

TIU-PAR-E016

Objective: The objective of urban form laboratories is to allow free experimentation and in-depth inquiry into the patterns and processes of urbanism as well as connected production of urban form and space.

Module 1: Overview:

Visions of city form; Patterns of human settlement through history; Contemporary theories of urbanity & urban design; Spatial & social structure; Elements of urban form.

Module 2: The Nature of City Form Theory:

Normative theories- the city as supernatural, the city as machine, the city as organism.

Module 3: Current Theory and Practice:

City form and process; Spatial and social structure; Theory- bipolarity, colony and post colony; Modern and post-modern urbanism.

Module 4: Cities of the Developing World:

Contemporary issues- sprawl, infill, redevelopment, gentrification.

Module 5: Indian City Form:

Evolution of city form and process; Land; Landscape and townscape; Contemporary urban form issues; Case studies.

Module 6: Current Debates and Rethinking City Form:

Contemporary urbanization; New urbanism; Urban growth, density and sustainability; Inequality, segregation and diversity; Informality; Environment and infrastructure.

Module 7: Guest Lecture by Industry Expert on Relevant Topic

List of books

- Lynch, K., "Good City Form", Cambridge, MA: MIT Press. 1981
- Kostoff, S., "The City Shaped: Urban Patterns/Meanings Through History", Boston: Little Brown. 1991
- Jacobs, J., "The Death and Life of Great American Cities", New York: The Modern Library. 1993
- Lawrence, J.V., Warner, "Imaging the City: Continuing Struggles and New Directions", Centre for Urban Policy Research. 2001
- Pierce, Johnson, "Century of the city: No time to Loose", The Rockefeller Foundation. 2008

- Tonkiss, F., “Cities by Design: The Social Life of Urban Form”, Polity. 2014

Subject Name: Applied Geographical Information System
(Analytical Training) **(L-S-P:3-0-0)**

TIU-PAR-E017

Objective: This course aims to give participants state-of-the-art remote sensing and GIS skills which will allow them to rise to the challenge of managing the rapidly changing urban environment of Indian cities.

Overview:

- Strengthen foundation concepts in Remote Sensing and GIS.
- Give participants a set of operational skills enabling them to support urban planning and management with remote sensing and GIS-based assessments.
- Instruct participants in state-of-the-art methods for land-use classification and land-use change detection.
- Teach participants to assess and quantify urban expansion, both planned and un-planned, with advanced remote sensing methods and declassified satellite imagery.

List of books

- GIS Tutorial 1: Basic Workbook by Wilpen L. Gorr and Kristen S. Kurland. Esri Press, 2010, 428 pp., ISBN-13: 9781589482593
- GIS Tutorial 2: Spatial Analysis Workbook by David W. Allen Esri Press, 2010, 340 pp., ISBN-13: 9781589482586
- GIS Tutorial 3: Advanced Workbook by David W. Allen and Jeffery M. Coffey Esri Press, 2010, 412 pp., ISBN-13: 9781589482074
- Getting to Know ArcGIS Desktop, Second Edition, Updated for ArcGIS 10 by Tim Ormsby, Eileen J. Napoleon, Robert Burke, Carolyn Groessl, and Laura Bowden. Esri Press, 2010, 600 pp., ISBN-13: 9781589482609

The GIS 20: Essential Skills by Gina Clemmer. Esri Press, 2010, 155 pp., ISBN-13: 9781589482562

Subject Name: Advanced Urban Transportation **(L-S-P:3-0-0)**

TIU-PAR-E018

Objective: Aim of this course is to expose the students to the state of the art in urban transportation planning with focus on Landuse-Transport interaction modeling and simulation, Sustainable Transport systems planning and Intelligent transportation systems.

Landuse-Transport interaction modeling and simulation:

Disaggregate transport demand models, accessibility model, residence and employment location choice model, real estate development model, land price model, simulation and scenario analysis using transportation and GIS software.

Sustainable Transport systems planning:

(Public transport and non-motorized transport planning); Capacity & quality of service, allied infrastructure and facilities planning, cost of public transit, public transport operation analysis, impact on environment.

Intelligent transportation systems:

Transportation needs of developing countries; new innovation in transportation hardware, traffic management systems, advanced traveler information systems, advanced vehicle control systems, electronic toll collection systems, advanced public transportation systems.

Pavement Design: Desirable characteristics of pavement, Types and components, Difference between Highway pavement and Urban Pavement, Fundamentals of Design of Pavements. Flexible pavement, rigid pavement, permeable pavement. Role of pavements & hard landscapes in urban flood management.

List of books

- De Dios Ortuzar, J. & Willumsen, L.G., 2011. Modelling transport, John Wiley & Sons.Train, K.E., 2009.
- Discrete Choice Methods with Simulation, Second Edition, University of California, Berkeley: Cambridge University Press.
- Forester, John, Bicycle Transportation, A Handbook Cycling Transportation Engineers, Second Edition, The MIT Press, Cambridge, Massachusetts.
- Sussman, Joseph M., Perspectives on Intelligent Transportation Systems, Springer
- Washington, Simon P., Karlaftis, Matthew G., Mannering, Fred, L., Statistical and Econometric Methods for Transportation Data Analysis, Second Edition, CRC Press, Tailor & Francis Group

- Ben-Akiva, Moshe E and Lerman, S.R., 1985. Discrete choice analysis: theory and application to travel demand, MIT Press.
- May, Adolf D., Traffic Flow Fundamentals, Prentice Hall
- Waddell, P. (2002). "Urban Sim: Modeling Urban Development for Land Use, Transportation and Environmental Planning." Journal of the American Planning Association.
- Waddell, P., A. Borning, et al. (2003). "Microsimulation of Urban Development and Location Choices: Design and Implementation of UrbanSim." Networks and Spatial Economics.

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