

**ANNA UNIVERSITY, CHENNAI**  
**AFFILIATED INSTITUTIONS**  
**M.ARCH. (REAL ESTATE DEVELOPMENT)**  
**REGULATIONS – 2017**  
**CHOICE BASED CREDIT SYSTEM**

**PROGRAMME EDUCATIONAL OBJECTIVES (PEOs) :**

- I. To provide students with additional knowledge and skills as in real estate market dynamics, property management and valuation.
- II. To enable students to add value to real estate development by integrating the components of legal framework & the regulatory mechanism.
- III. To enable students to widen the scope of their professional abilities through an integrated approach across domains demonstrated in a varying scale of projects.
- IV. To enable students to develop an attitude to face challenges of the changing market scenario, take diligent decisions and make a resourceful value addition.
- V. To enable students to contribute to the larger society through their future career as a real estate consultant, responsive developer / promoter of land and property, teacher and researcher.

**PROGRAMME OUTCOMES (POs):**

On successful completion of the programme,

1. Graduates will demonstrate skill in applying the nuances of real estate principles in practice.
2. Graduates will gain expertise at strategic planning and acquire arbitration skills.
3. Graduates will be able to bring technical expertise across domains and integrate with aspects of land, market and environment.
4. Graduates will be able to identify potentials and constraints specific to context and in its global perspective.
5. Graduate will be able to approach projects based on real time context and provide holistic development strategies.
6. Graduates will be able to analyse varied scenarios, assess existing proposals and seek alternative solutions.

7. Graduates will be able to identify and translate change across the market and stake holders.
8. Graduates will be able to contribute further to society through holistic and responsible real estate developmental inputs and interventions.

Programme Educational Objectives	Programme Outcomes							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
I	x							
II		x						
III			x	x				
IV					x	x	x	
V								x

		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
<b>YEAR 1</b>	<b>SEM 1</b>	Introduction to Real Estate Development & Design							x	
		Urban Policy and Development Control Regulation					x			
		Urban Design, Retrofitting and Adaptive Reuse				x				
		Real Estate Finance							x	
		Real Estate Valuation					x			
		Real Estate Development Studio- I			x					
	<b>SEM 2</b>	Legal Framework for Real Estate		x						
		Construction Project Management					x			
		Emerging Trends in Housing						x		
		Real Estate Development Studio- II								x
		<u>Elective I</u>								
		<u>Spatial Information Systems</u>			x					
		Global Real Estate Management				x				
		<u>Elective II</u>								
	Environmental Impact Assessment								x	

		Performance Evaluation of Buildings						x			
<b>YEAR 2</b>	<b>SEM 3</b>	Arbitration and Advanced Professional Practice		x							
		Research Methodology in Real Estate					x				
		Project Phase I - Dissertation							x		
		Real Estate Development Studio- III									x
		Elective III									
		Real Estate Marketing						x			
		Capital Markets and Real Estate									x
		Elective IV									
		Real Estate Economics Ecology and Landscape	x								
		<b>SEM 4</b>	Professional Training						x		
	Project Phase II - Thesis		x								
	Elective V										
	Building Information Modeling									x	
	Web Design and Portfolio Production								x		

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**REGULATIONS – 2017**  
**CHOICE BASED CREDIT SYSTEM**  
**CURRICULA AND SYLLABI FOR I TO IV SEMESTERS**  
**SEMESTER I**

S. No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C
<b>Theory</b>								
1.	RE5101	Introduction to Real estate Development and Design	PC	3	3	0	0	3
2.	RE5102	Urban Policy and Development Control Regulation	PC	3	3	0	0	3
3.	RE5103	Urban Design, Retrofitting and Adaptive Reuse	PC	3	3	0	0	3
4.	RE5104	Real Estate Finance	HS	3	3	0	0	3
<b>Theory Cum Studio</b>								
5.	RE5121	Real Estate Valuation	PAEC	4	2	0	2	3
<b>Studio</b>								
6.	RE5111	Real Estate Development Studio- I	PC	10	0	0	10	5
<b>TOTAL</b>				<b>26</b>	<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>

**SEMESTER II**

S. No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C
<b>Theory</b>								
1.	RE5201	Legal frame work for Real Estate	HS	3	3	0	0	3
2.	MH5202	Emerging Trends in Housing	PC	3	3	0	0	3
3.	MH5251	Research Methodologies in Architecture	PC	3	3	0	0	3
4.		Professional Elective -I	PE	3	3	0	0	3
5.		Professional Elective - II	PE	3	3	0	0	3
<b>Studio</b>								
6.	RE5211	Real Estate Development Studio- II	PC	10	0	0	10	5
<b>TOTAL</b>				<b>25</b>	<b>15</b>	<b>0</b>	<b>10</b>	<b>20</b>

### SEMESTER III

S. No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C	Pre-requisites	
<b>Theory</b>										
1.	MH5351	Arbitration and Advanced Professional Practice	PAEC	3	3	0	0	3	Pass in Real Estate Dev. Studio –I (Sem I)	
2.	RE5301	Construction Project Management	PAEC	3	3	0	0	3		
3.		Professional Elective – III	PE	3	3	0	0	3		
4.		Professional Elective – IV	PE	3	3	0	0	3		
<b>Studio</b>										
5.	RE5311	Real Estate development Studio- III	PC	10	0	0	10	5		
6.	RE5312	Project Phase I - Dissertation	PC	6	0	0	6	3		
<b>TOTAL</b>				<b>28</b>	<b>12</b>	<b>0</b>	<b>16</b>	<b>20</b>		

### SEMESTER IV

S. No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C	Pre-requisites
<b>Studio</b>									
1.		Professional Elective – V	PE	6	0	0	6	3	Pass in Real Estate Dev. Studio II & III and Project Phase I: Dissertation
2.	RE5411	Professional Training*	PAEC	-	-	-	-	2	
3.	RE5412	Project Phase II- Thesis	PC	20	0	0	20	10	
<b>TOTAL</b>				<b>26</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>15</b>	

\* Professional Training of duration minimum 4 weeks full time or 8 weeks part time to be done in a Real Estate / Project Management firm during semester vacation.

**TOTAL NO OF CREDITS: 75**

### PROFESSIONAL ELECTIVE (PE)

PROFESSIONAL ELECTIVE (PE) - I								
Sl.No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C
1	RE5071	Spatial Information Systems	PE	3	3	0	0	3
2	RE5001	Global Real Estate Management	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE (PE) - II								
3	EA5192	Environmental Impact Assessment	PE	3	3	0	0	3
4	MH5221	Performance Evaluation of Buildings	PE	4	2	0	2	3

PROFESSIONAL ELECTIVE (PE) - III								
5	RE5002	Real Estate Marketing	PE	3	3	0	0	3
6	RE5003	Capital Markets and Real Estate	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE (PE) - IV								
7	RE5004	Real Estate Economics	PE	3	3	0	0	3
8	RE5005	Ecology and Landscape	PE	3	3	0	0	3

PROFESSIONAL ELECTIVE (PE) - V								
9	MH5281	Building Information Modeling	PE	6	0	0	6	3
10	MH5071	Web Design and Portfolio Production	PE	6	0	0	6	3

### HUMANITIES SCIENCE (HS)

Sl.No.	Course Code	Course Title	Category	Contact Periods	L	T	P/S	C
1	RE5104	Real Estate Finance	HS	3	3	0	0	3
2	RE5201	Legal frame work for Real Estate	HS	3	3	0	0	3

### PROFESSIONAL CORE (PC)

Sl.No.	Course Code	Course Title	Category	Contact Periods	L	T	P /S	C
1.	RE5101	Introduction to Real estate Development and Design	PC	3	3	0	0	3
2.	RE5102	Urban Policy and Development control Regulation	PC	3	3	0	0	3
3.	RE5103	Urban Design, Retrofitting and Adaptive Reuse	PC	3	3	0	0	3
4.	RE5111	Real Estate Development Studio- I	PC	10	0	0	10	5
5.	MH5202	Emerging Trends in Housing	PC	3	3	0	0	3
6.	MH5251	Research Methodologies in Architecture	PC	3	3	0	0	3
7.	RE5211	Real Estate Development Studio- II	PC	10	0	0	10	5
8.	RE5312	Project Phase I- Dissertation	PC	6	0	0	6	3
9.	RE5311	Real Estate development Studio- III	PC	10	0	0	10	5
10.	RE5412	Project Phase II- Thesis	PC	20	0	0	20	10

### PROFESSIONAL ABILITY ENHANCEABILITY COURSE (PAEC)

Sl.No.	Course Code	Course Title	Category	Contact Periods	L	T	P /S	C
1	RE5121	Real Estate Valuation	PAEC	4	2	0	2	3
2	MH5351	Arbitration and Advanced Professional Practice	PAEC	3	3	0	0	3
3	RE5301	Construction Project Management	PAEC	3	3	0	0	3
4	RE5411	Professional Training*	PAEC	-	-	-	-	2

**RE5101 INTRODUCTION TO REAL ESTATE DEVELOPMENT AND DESIGN L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To understand land as a resource.
- To appreciate the role of team work to make a successful project
- To provide adequate inputs so as to make to the whole development as a smooth activity and ultimately be aware of the tactical aspects of marketing the completed property.

**UNIT I CONCEPTS 6**  
 Fundamental Concepts, Techniques & Sequential events in Real Estate Development Process

**UNIT II EVENTS AND PRE PROJECT STUDIES 6**  
 Site evaluation – Development Team assembly – Micro and Macro market study

**UNIT III DEVELOPMENT PLANNING & APPROVAL PROCESS 9**  
 Planning objectives, Master plan & Detailed Development Plan. Front end clearances from various authorities.

**UNIT IV CURRENT TRENDS IN REAL ESTATE 9**  
 SEZ, SPV, Joint ventures, Smart city concepts, Types & Parameters, Franchisee systems, Green building, Rating of Buildings (CARE, CRIL, ICRA)

**UNIT V MARKETING & HANDING OVER 15**  
 Communication tools required for presenting the project, In house sales promotion, franchisee system, Public relations, Branding, transfer of completed project.

**TOTAL: 45 PERIODS**

**OUTCOMES**

- The student will gain knowledge about the recent trends in Real Estate.
- The student will improve the skill in applying the various principles and techniques taught in the subject
- The student attains knowledge in marketing and communication tools required for presenting the project

**REFERENCES:**

1. Fillmore W Galaty, “Modern Real estate practice” (2002); Dearborn Trade Publishing, New York, U.S.A.
2. Gerald R Cortesi, “Mastering Real estate principles” (2001); Dearborn Trade Publishing, New York, U.S.A.
3. Mike .E. Miles, “Real estate development – Principles & Process 3<sup>rd</sup> edition, (2000); Urban Land Institute, ULI – Washington DC
4. Richard B Peiser & Anne B. Frej, “Professional real estate development” – The ULI guide to the business – (2003), Urban Land Institute U.S.A.
5. Tanya Davis, “Real estate developer’s handbook”, (2007), Atlantic pub company, Ocala, USA.

**RE5102 URBAN POLICY AND DEVELOPMENT CONTROL REGULATION L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To understand the implications of the urbanisation on urban land.
- To capture the form and pattern of cities growth and market prices.
- To provide inputs for keeping tag of quality, even while trying to make profit taking note of various regulatory regimes on land and development present in the country.
- To understand the related planning theories concerned with real estate



<b>UNIT I</b>	<b>UNDERSTANDING URBAN GROWTH</b>	<b>9</b>
Basics of Urban Planning- dynamic forces driving Urban growth – Urban spatial configuration. Regional influences on settlement hierarchy.		
<b>UNIT II</b>	<b>LOCATIONAL DETERMINANTS</b>	<b>6</b>
Land use structure – Community & Neighborhood Dynamics - Urban Land rent & Location Theories		
<b>UNIT III</b>	<b>QUALITY OF DEVELOPMENT</b>	<b>10</b>
Urban Quality – degeneration –Urban Renewal – regeneration - Sustainable development		
<b>UNIT IV</b>	<b>POLICIES ON PUBLIC PRIVATE HOUSING</b>	<b>10</b>
Government Policies – on public & private housing – Urban Fiscal Policies – Property Taxation – local Govt. Finance – Public policies on land & real estate – Impact of Govt. Regulations		
<b>UNIT V</b>	<b>PUBLIC PRIVATE PARTICIPATION</b>	<b>10</b>
System drawn and informal participation, various models of public participation, participatory plan formulation, resource mobilization, maintenance and management.		

**TOTAL: 45 PERIODS**

**OUTCOMES**

- The students will acquire knowledge on the different policies framed by the National & State Government.
- The course will understand the implications of urbanisation, the advantages and a disadvantages

**REFERENCES:**

1. David T Betto, “The Voluntary city Markets, Communities & Urban Planning” (2006)
2. Frieden, Bernard & Lyne Sagalyn, “Enterpreneurial cities & marverik developers, deal amking, getting & spending”, (1990) MIT. Press, U.S.A
3. John Ratcliffe; “Urban Planning & Real estate development, (2004); Taylor & Francis pub. U.K.
4. Jonathan Barnett; “Urban design as a public policy”, (1974), Mc Graw hill book co; New York.
5. Robert Freestone; “Urban Planning in a changing world – the 20<sup>th</sup> century experience 2000; Taylor & Francis pub. U.K.

<b>RE5103</b>	<b>URBAN DESIGN, RETROFITTING AND ADAPTIVE REUSE</b>	<b>L T P/S C</b>
		<b>3 0 0 3</b>

**OBJECTIVES:**

- To impress upon the professionals to look at the Real Estate from a broader perspective of urban aesthetics rather than islands of excellence / dreary development.
- To provide adequate inputs to understand the larger contextual land dynamics as an integral part of the urban fabric.
- To demonstrate the value addition to property development by adhering to urban aesthetics as a leverage for price mechanism.
- Emphasizing the need for sustainability of the existing morphology through adaptive reuse to provide alternative options in urban renewal with reference to changing market dynamics

<b>UNIT I</b>	<b>INTRODUCTION TO URBAN DESIGN THEORY</b>	<b>6</b>
City as a three – dimensional entity, study of volumes & open spaces, a brief historic review of the development of the urban design discipline and principles. Land as a commodity and raw material		

**UNIT II ELEMENTS OF URBAN DESIGN 10**  
 Urban form as determined by the inter-play of masses, voids, building typology, scale, density, height, bulk, urban signage & graphics, organization of spaces & their articulation in the form of squares, streets, vistas & focal points. Image of the city & its components.

**UNIT III PHYSICAL & NON –PHYSICAL DETERMINANTS OF URBAN FORMS 10**  
 Activity & Morphology size & structure of cities, networks – TOD Models, open spaces, public realm and place making case studies of urban design characteristics co-related with their determinants, case studies of urban design characteristics of cities in India & abroad, issues for public intervention and participation.

**UNIT IV RETROFITTING OF BUILDINGS / PROPERTIES AND ADAPTIVE REUSE 10**  
 Methods & mechanisms – Urban Renewal – Rehabilitation, Redevelopment & Conservation – Adaptive Re-use, retrofitting, Facadism, Commodification – Context and Case Studies

**UNIT V CASE STUDIES 9**  
 Legal framework & administrative aspects, policies & charters. Case studies of proposals for conservation / adaptive reuse from India & Abroad. Sustainable development, Brownfield projects, mixed use strategies ( examples in Indian and Western context)

**TOTAL: 45 PERIODS**

**OUTCOMES**

- The students will be equipped to incorporate principles of Urban design in real estate strategies
- The students will understand the gap between Architectural Design & Urban Planning and hence the role of Urban Design in Real Estate development.
- The students would be sensitized to the significance of adaptive reuse and retrofitting with its implications in real estate

**REFERENCES:**

1. Cliff Monghtin, “UD-Street & Squace,” (2003), Architectural Press.
2. Edmund Bacon, “ Design of Cities (1976), revised edition, Viking Penguin Inc, USA
3. Gcoffrey Broadbent, “Emerging concepts in Urban Space Design-(1995), Jayker & Fravels.
4. Jon Lang, “Urban design” – a typology pf procedures & products 2005, Glsevier, North America.

**RE5104 REAL ESTATE FINANCE L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- Basic analytical methods for investment and financing in properties.
- Influences of international modes of decision making.
- Understanding risks in real estate as a tool in mortgaging and investment performance.

**UNIT I FUNDAMENTAL CONCEPTS 6**  
 Principles, analytical methods and tools useful for making investment and finance decisions regarding individual properties (Commercial, Industrial, Residential), Bench Marking.

**UNIT II CONVENTIONAL AND NON-CONVENTIONAL FINANCE 7**  
 Institutional real estate decision making (pension funds, banks, life insurance companies, investment trusts, joint venture) debt financing

**UNIT III RISK ANALYSIS and SECURITIZATION 10**  
 Forecasting cash flows and estimating risk in real estate investments, Development of real estate securitization and structured financing including mortgage contract – Mortgage and options including calculation of various durations to evaluate risk sharing

**UNIT IV FINANCIAL TOOLS 12**  
 Discounted Cash Flow, Return on Investment, IRR, NPV, Payback Period, CBR, CBA, Debt Service Coverage Ratio, Techniques of Financial Appraisal

**UNIT V CASE STUDIES OF FINANCING OF PROJECTS 10**  
 Financial Viability, Capital Cost, Operational cost, Planning, Analysis, Costing, Income/Expenditure Statement, Balance Sheets

**TOTAL: 45 PERIODS**

**OUTCOMES**

- Students will acquire knowledge on development of real estate securitization and structured financing including mortgage contract helps to calculate the various durations to evaluate risk sharing in RED.
- Students will be able to practice the principles, analytical methods and tools are useful for making investment and finance decisions.

**REFERENCES**

1. David Falk; “The fundamentals of Real estate finance”, (2005).USA
2. GE Greer, “Investment analysis for R E decision”, (2003), Dearborn R E education.
3. Ira Nachem, The complete guide to “Financing real estate development” 2007- Mc Graw hill companies, USA.
4. Nathan. S. Collier, “Construction finding – the process of RE development, Appraisal & finance (2007); John Wiley & Sons Inc; New Jersey.
5. Terrence M Clauritie, “Real estate finance: Theory & practice”, (2005), Prentice hall, U.S.A

**RE5121 REAL ESTATE VALUATION L T P/S C**  
**2 0 2 3**

**OBJECTIVES:**

- To equip students with the techniques of valuation of properties.
- To provide the required input to create space for specialization in this area.
- To perform real estate valuation for different kinds of properties as case study.

**UNIT I FUNDAMENTAL PRINCIPLES AND CONCEPT OF VALUE 7**  
 Open market value – Property and Property Market – Property as an Investment.

**UNIT II NATURE AND SCOPE OF VALUATION 9**  
 Valuation function – Role and functions of valuer – Scope – Value Theory – Process.

**UNIT III DETERMINATION OF VALUES****9**

Techniques to determine the values for loan, sale and insurance – Professional standards – report writing – Leasehold Valuation – different methods.

**UNIT IV EVALUATION OF INCOME AND PROPERTY****15**

Discounting and compound interest – Income Estimation and forecasting – debt financing – capitalization and discount rates – tax considerations – introduction to mortgage equity analysis – financial residual techniques.

**UNIT V CASE STUDY****20**

Property valuation – Residential, Retail, Office, Industry & Hospitality. Methods of valuation – Land & Building, Rent capitalization, Direct comparison, Composite Method.

**TOTAL: 60 PERIODS****OUTCOMES**

- Students will get trained to value various kinds of property.
- The Case Study based approach would equip students to handle similar valuation projects in their professional practice.

**REFERENCES**

1. “Valuation of Immovable properties” (Under Direct Taxes) edn(2002), Grish Chand Gupta, Bharath Law House, New Delhi-83.
2. Aswath Damodaran, Investment Valuation (2002), John Wiley & Sons, UK.
3. Howard C Gelbtuch, “Real estate valuation in global markets”, (1997), Appraisal institute.
4. Ko Wang, Real estate valuation theory, (2001) Kluwer Academic publishers, S. America.

**RE5111****REAL ESTATE DEVELOPMENT STUDIO - I****L T P/S C  
0 0 10 5****OBJECTIVES:**

- To make students elaborate on the synergies between how one specializes development and how real estate dynamics shape and influence plotted land development.
- To apply tools, instruments and strategies for design thinking and understand the mechanisms of finance and market forces that shape and impact real estate development
- The studio will provide students the skills to visualize and communicate concepts about a site and enable the assessment of a project for its development potential, understanding the myriad of factors that influence a project

**CONTENTS**

Analysis of current market trends will be the starting point of this studio to sensitize students to the issues of land and corporate development. This will culminate in a project on Plotted Land Development where students will incorporate processes by which developers, investors, architects and urban designers and planners conceptualize various frameworks for real estate development.

The deliverables for the Studio include–Site Analysis, Demand assessment, Product mix, Zoning & circulations, Housing Typology, Layout plan, Infrastructure, Landscape plan. Project Costing, Cash flow, ROI, & IRR and Feasibility Analysis Report.

**TOTAL: 150 PERIODS****OUTCOMES**

- The students will have an understanding of layout and project formulation for real estate, from the point of view of land and infrastructure development

- To acquire skills on planning of mixed use developments.
- The students will be introduced to risk involved in real estate projects.
- The students would be equipped to perform a SWOT analysis.
- The student will acquaint themselves with the need and implementation of infrastructure.

**RE5201**

**LEGAL FRAMEWORK FOR REAL ESTATE**

**L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To equip students with formalities and regulatory mechanism of land ownership, transfer, lease and mortgage regulations.
- To examine the effect of Development control rules on the property market.
- To expose students to the Tender process, Construction contracts & bidding evaluation.
- To introduce students to legal requirements of land and its development.

**UNIT I REGULATORY REGIME**

**9**

Laws and regulatory Framework – Understanding and appraisal of the regulatory regime  
Development Control - Land use regulations – ordinances – subdivision rules -- Land Acquisition – Land ceiling act, Town and country planning Act, municipalities and local bodies act, Acts relating to environmental quality and infra structure development. Real Estate Regulatory Act ( RERA)

**UNIT II REGISTRATION and TRANSFER OF PROPERTY**

**10**

Law of Property, examining the rules relating to the transfer of land, the system of registration of title, co-ownership of land - Land title – Tenancy  
Transfer of Property – Possession -rights – leases – mortgage

**UNIT III CONSTRUCTION CONTRACTS**

**11**

–Indian Contracts Act – Elements of Contracts – Types of Contracts – Features – Suitability – Design of Contract Documents- International Contract document - Standard Contract Document – Law of Torts.

**UNIT IV TENDERS**

**9**

Tenders – Prequalification – Bidding – Accepting – Evaluation of Tender Form – Technical – Contractual –Contract Formation and Interpretation – Potential Contractual Problems – World Bank Tender Procedures and Guidelines

**UNIT V LABOUR REGULATIONS**

**6**

Labour Regulations – Social Security – Welfare Legislation – Laws relating to wages – Bonus and Industrial disputes – Labour Administration – Insurance and safety Regulations – Workmen’s Compensation Act – Other Labour Laws.

**TOTAL: 45 PERIODS**

**OUTCOMES**

- The students are exposed to the rules and regulation in obtaining Approval.
- The student will understand the dynamics of transfer of land and the system of registration of title.
- The students will be sensitized to design of International contract documents & World Bank Procedural Rules.

## REFERENCES

1. Catherine Ellioth, Contract Law (2003)
2. Judith – Anne Mackenzie, “Text book on Land Law”, (2004), Oxford University Press, U.K.
3. Kendem Adward Digby, “An introduction to the history of the law of real property” (2005), the law book exchange Ltd. UK.
4. Kevin J Gray, “Elements of land law”, (2004), Lexis Nexis, U.K.
5. Richard Willmot Constructions Contracts – Law & Practice Oxford University Press, U.S.A.
6. V.G. Ramachandran, “Law of land acquisition & compensation, 8<sup>th</sup> edition, 2000, Eastern Book Company, Lucknow.

**MH5202**

**EMERGING TRENDS IN HOUSING**

**L T P/S C**  
**3 0 0 3**

### OBJECTIVES:

- This course will examine the redefinition of contemporary housing within the contexts of Multicultural cities due to globalisation.

### UNIT I INTRODUCTION

**8**

Outline of housing development from its industrial beginnings in London and Paris to New York City’s Lower East Side and the 20th-century designs of Le Corbusier, Antonio Sant’Elia, and Mies van der Rohe to mention a few. Investigation of contemporary life and its influence on space and architecture- Globalization and influences on economy- Alternate housing solutions: Commune, Co Housing, Cooperatives, etc.

### UNIT II SINGLE FAMILY, MULTI FAMILY HOUSING

**9**

Review of latest developments in single family and multi family housing by examining the works of Wiel Arets, Shigeru Ban, Ben van Berkel, Kees Christiaanse, Philippe Gazeau, Frank O. Gehry, Steven Holl, Hans Kollhoff, Morger & Degelo, , Jean Nouvel, Kas Oosterhuis, MVRDV

### UNIT III HIGH DENSITY HOUSING

**9**

Issues and concerns- Review of the current state of high density houses - the perspectives and future developments through a study of a few international projects.

### UNIT IV NEW FORMS OF LIVING AND HOUSING IN THE DIGITAL ERA

**9**

Hyper Housing- Multi cultural Housing- lab rooms and cyber homes- Network housing- hybrid buildings- individual sheltered residences; residence cities and bio homes for senior citizens- Works of UN Studio; FOA;; OMA

### UNIT V DEFINITION OF HOUSING IN THE INDIAN CONTEXT

**10**

Design strategies in the context of Indian metropolitan cities through case studies

**TOTAL: 45 PERIODS**

### OUTCOMES

- The students will acquire knowledge in the development of single and multifamily housing type designs relevant to market dynamics.
- The students will acquire knowledge in new forms of living and housing in the digital era

### REFERENCES:

1. Jingmin ZHOU; Urban housing
2. Manuel Gausa and Jaime Salazer; Housing+ Single Family Housing; Birkhauser- Publishers for Architecture; 2005
3. Vincene Guillart; Sociopolis: Project for a city of the Future; ACTAR; 2004

**OBJECTIVES**

- To introduce the students to the importance of critical inquiry as a way of gaining knowledge and adding to it through research.
- To expose the students to the various forms of research and research methodologies/processes.
- To engage this understanding in the specific field of architectural research.

**UNIT I INTRODUCTION****9**

Basic research issues and concepts- orientation to research process- types of research: historical, qualitative, co-relational, experimental, simulation and modeling, logical argumentation, case study and mixed methods- illustration using research samples

**UNIT II RESEARCH PROCESS****9**

Elements of Research process: finding a topic- writing an introduction- stating a purpose of study identifying key research questions and hypotheses- reviewing literature- using theory- defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis- illustration using research samples

**UNIT III RESEARCHING AND DATA COLLECTION****9**

Library and archives- Internet: New information and the role of internet; finding and evaluating sources- misuse- test for reliability- ethics

Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- Problems encountered in collecting data from secondary sources.

**UNIT IV REPORT WRITING****6**

Research writing in general- Components: referencing- writing the bibliography - developing the outline - presentation; etc.

**UNIT V CASE STUDIES****12**

Case studies in the relevant discipline illustrating how good research can be used from project inception to completion- review of research publications.

**TOTAL: 45 PERIODS****OUTCOMES**

- The student will develop the skill to identify, decipher and interpret issues relating to architecture based on research enquiry methods.
- The student will gain knowledge of different methods of conducting research and research writing.

**REFERENCES**

1. Iain Borden and Kaaterina Ruedi Ray ; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2006
2. JA Smith, P Flowers, M Larkin -Interpretative Phenomenological Analysis: Theory, Method and Research (English) FIR Edition- Sage Publication -2009.
3. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2011.
4. Linda Groat and David Wang; Architectural Research Methods – 2<sup>nd</sup> edition ,John Wiley & Sons Inc,Hoboken,New Jersey, US , 2013.

5. Ranjith Kumar; Research Methodology- A step by step guide for beginners-3<sup>rd</sup> Edition ; Sage Publications;2011
6. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; 'The Craft of Research' , 3<sup>rd</sup> Edition; Chicago guides to writing, editing and publishing;2008

**RE5211**

**REAL ESTATE DEVELOPMENT STUDIO - II**

**L T P/S C**  
**0 0 10 5**

**OBJECTIVES:**

- Understanding the concepts of layout and project formulation for real estate, from the point of view of land, building and infrastructure development. Analyzing customer segmentation and product strategy
- Assessing branding in design using a benefit/cost approach
- Exploring bidding, cost control, and project scheduling
- Balancing financial analysis with project scope and aesthetics

**CONTENTS**

Mega project Township – Large scale components, Residential, commercial, Institutional, Industrial & mixed use of developments.– **Site Analysis, Demand assessment, Product mix, Zoning & circulations, Housing Typology, Layout plan, Infrastructure, Landscape plan. Project Costing, Scheduling, Cash flow, ROI, & IRR – A Feasibility Analysis Report.**

**TOTAL: 150 PERIODS**

**OUTCOMES**

This studio positions real estate development as a collaborative process where students will:

- Acquire skills on planning of mixed use developments by balancing financial analysis with project scope and aesthetics
- Use scenario planning to minimize surprises and evaluate real options in real estate development
- Acquaint themselves with uncertainty analysis and its implication on real estate development
- Specifically discuss about options and mobilization of finance
- Unbundling of Infrastructure options and affordability

**MH5351**

**ARBITRATION AND ADVANCED PROFESSIONAL PRACTICE**

**L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To provide exposure to the importance and intricacies of Arbitration as an Alternative Disputes Resolution (ADR) Mechanism.
- To learn the importance of various legislations and Acts as well as the relevance of 'Awards' and judgments given by courts.
- To enable the understanding of the roles and responsibilities of various professional bodies.
- To provide and exposure to the systems and proceeding of Arbitration.



**UNIT I IMPORTANCE OF ARBITRATION AS AN ALTERNATIVE DISPUTES RESOLUTION (ADR) MECHANISM 9**

Importance of Arbitration – Role of Arbitration in any contract agreement- Arbitration clause in any contract agreement - Rate of Architects, in Arbitration - Contracts Act of 1872, Limitation Act 1963 and Arbitration and conciliation Act 1996 its terms & Provisions - Costs involved for Arbitration.

**UNIT II APPOINTMENT OF ARBITRATORS - THEIR ROLES AND RESPONSIBILITIES, TECHNICAL TERMS AND COMMENTS 9**

How Arbitration proceedings are initiated - Reasons leading to Arbitration - Procedures and Communication - Composition of Arbitral Tribunal - Appointment of Arbitration and umpire - Interim Measures by Court / Arbitral Tribunal - Jurisdiction of Arbitral Tribunal - Conduct of Arbitral proceedings - Determination of Rules and procedure.

**UNIT III ARBITRAL PROCEEDINGS 9**

Place and language of proceedings - Claim statements and counter claim - Hearings and written proceedings - Experts and Assistance from courts - Form and contents of Arbitral Awards - Setting aside the Arbitral awards - Appeals, insolvency and Limitation - Misconduct of Arbitrator.

**UNIT IV PROJECT MANAGEMENT CONSULTANCY 9**

Introduction - practices and strategic issues related to construction project management - understanding of issues related to management of clients and other stakeholders involved in the delivery of a project.

**UNIT V PRACTICE AND CASE-STUDIES 9**

Emerging trends in Arbitration in India through Cases – Landmark awards and judgements by the various courts and judiciary - Case Studies in Project Management Consultancy.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- The student will be familiar with the various legal systems that are in force and the methods of handling disputes.
- The student will understand the role and responsibility and the ethical standards that govern an architectural practice.

**REFERENCES:**

1. Abdul Razzak Rumane, Quality Tools for Managing Construction Projects, Taylor & Francis Group; ISBN13-9781466552142.
2. Dr. Roshan H. Namavati Professional Practice, 2001 Edition.
3. K.G. Krishnamurthy, S.V. Ravindra: Professional Practice, Prentice Hall India Learning Private Limited (2014).
4. Prof. Madhav Deobhakta and Architect Meera Deobhakta; Architectural Practice India, 2nd Edition, 2008.
5. Prof. Madhav Deobhakta; Arbitration for Architects and Project Managers, 2011.

**RE5301**

**CONSTRUCTION PROJECT MANAGEMENT**

**L T P/S C  
3 0 0 3**

**OBJECTIVES:**

- To acquire adequate knowledge to work with multi disciplinary team.
- To understand key stages in the lifecycle of a construction project from inception to disposal.
- Students will learn the critical success factors, sustainability, evaluation of project options, structured methodologies, and the concept of whole-life costing of projects.

<b>UNIT I</b>	<b>INTRODUCTION TO PROJECT MANAGEMENT</b>	<b>8</b>
Project management - Project Life cycle – Selection of Professional services – Role of Project Managers		
<b>UNIT II</b>	<b>FUNDAMENTALS OF CONSTRUCTION PLANNING</b>	<b>12</b>
Work Breakdown structure – Precedence relationships among activities – Estimating Activity Durations, CPM, PERT, Activity Float, Crashing and Time cost tradeoff – Resource requirements for work		
<b>UNIT III</b>	<b>COST ESTIMATION, CONTROL AND MONITORING</b>	<b>10</b>
Cost Estimation, Methods of estimation, Estimates based on Engineers list of Quantities - The cost control problem – Forecasting for activity cost control – Control of project Cash Flows – Schedule control – Schedule & Budget Updates – Monitoring cost & Schedule information.		
<b>UNIT IV</b>	<b>QUALITY CONTROL &amp; SAFETY DURING CONSTRUCTION</b>	<b>7</b>
Quality & Safety Concerns in construction – Organising for Quality & Safety – work and material specifications -Total quality control – quality control by statistical methods – statistical quality control by sampling and Variables – Safety.		
<b>UNIT V</b>	<b>COMPUTER APPLICATIONS IN PROJECT MANAGEMENT</b>	<b>8</b>
Project Case study - Computer aided cost estimation – Applications in Softwares – Planning Activities, Resources, costs, quality, risks. Optimizing & Distribute the project Plan. Tracking and managing the project, as a project Case study.		

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- Students will understand the function of design management and its efficient integration into project management processes.
- They will examine techniques for the design of major construction projects, taking particular account of client needs, procurement structure and adaptability.
- Students will acquire knowledge and understanding of the theories, concepts, principles, techniques, and intellectual and practical skills needed for the project management of construction projects.

**REFERENCES:**

1. Calin M Popescu, "Project Planning, Scheduling & Control in Construction (1995), John Wiley & Sons. USA.
2. Conway K., Software Project Management, Editura Coriolis, ISBN 1576108074
3. James O' Brien, "CPM in Construction Management" (2006) Mc.Graw hill, USA.
4. Jimmie W. Hinze, "Construction planning & scheduling" (1997), Pretince hall. USA.
5. John Rodger Illingworth, (2000), "Construction methods & Planning", Taylor & Francis, U.K

<b>RE5311</b>	<b>REAL ESTATE DEVELOPMENT STUDIO - III</b>	<b>L T P/S C</b>
		<b>0 0 10 5</b>

**OBJECTIVES**

- To provide practical opportunities in an academic setting for students to sharpen their understanding of the development mechanism, in particular the Special Purpose Vehicle, Special Economic Zones and Smart Cities.
- To analyse the various issues in urbanization and finding a possible solutions at a City Scale

**CONTENTS:**

1. Understanding concepts of SPV, SEZ and SMART Cities – design, application of tools and techniques, proposals and promotion strategies
2. Optimization of concepts in urban design, architecture and the built environment as part of the larger economic and environmental issues relating to urbanism and city making.
3. Emphasis on the following thrust areas: infrastructure, sustainability and disaster management

**TOTAL: 150 PERIODS****OUTCOME:**

1. Develop an understanding of the development processes, as well as sensitivity to political and environmental issues relating to urbanism and city development/growth.
2. Acquire skills on planning of Industrial Projects using SPVs.
3. Explore the interrelationship between real estate, design, and, real estate market performance, ownership structures, private and public joint venture, as well as the efficacy of public financing.
4. Acquire skills for generating/comparing project profiles.
5. Be able to generate/compare project profiles and will be equipped to handle consultancy modalities/projects.

**RE5312****PROJECT PHASE I - DISSERTATION****L T P/S C**  
**0 0 6 3****OBJECTIVES**

- To provide scope for independent study, exploring specific areas of interest pertaining to Real Estate Development.
- To do case studies of Global Economic Scenarios and understand their impact on the real estate sector.
- To do critical analysis in the area of research and find possible solutions for the various issues.

**CONTENT**

The dissertation provides scope for independent study opportunity to explore specific areas of interest pertaining to Real Estate Development. The scholar shall select a topic of his / her choice with the approval of the HOD and write a comprehensive report.

**TOTAL: 90 PERIODS****OUTCOMES**

- The student will acquire knowledge in technical report writing.
- Student will learn to critically evaluate the study done.
- The student will learn to analyse, interpret and explain results and structure their research discourse for implementation in phases.

**RE5411****PROFESSIONAL TRAINING****L T P/S C**  
**- - - 2****OBJECTIVES**

- To expose students to the realities of real estate practice through Practical Training
- To facilitate an understanding of land development, market force, and financial implications.
- To enable an orientation that would include the process of development of Strategic planning, Valuation and advisory, presentation skills, involvement in office discussions, client meetings, tendering procedure and coordination with the agencies involved in the construction process.

**CONTENT:**

Students are placed into an internship / practical experience. This provides a unique opportunity for the students to gain hands- on work experience in the real estate industry, with a company in the same area as their desired career path. The Real Estate Internship Program aims to provide real world learning experience of both the private & public real estate organizations. Industry specialization areas include development activities, professional consultancy services, fund management as well as policy exposure in Government agencies

**OUTCOMES**

- Students learn to work on multiple projects in an office and learn all aspects relating to making real estate projects, from demand assessment, market situations, and possible product mix, presentations, financial feasibilities etc...

**RE5412**

**PROJECT PHASE II - THESIS**

**L T P/S C**

**0 0 20 10**

**OBJECTIVES**

- To showcase his / her prowess in the genesis and conceptualization of the all-round competence in real estate design.
- To integrate the implementation process to be demonstrated in the ultimate analysis.

**CONTENT**

Thesis gives an opportunity to the scholar to showcase his / her prowess in the genesis and conceptualization of the all-round competence in real estate design. It is a normal seminal work culminating into a comprehensive real estate design and development. The integration of the implementation process shall be demonstrated in the ultimate analysis.

**TOTAL: 300 PERIODS**

**OUTCOMES:**

- Students would be able to integrate various contemporary/ advanced issues and techniques into the real estate development process.
- Students would be able to identify and go in depth into specific and appropriate aspects relating to the real estate sector and reflect this in the thesis project.

**ELECTIVES**

**RE5071**

**SPATIAL INFORMATION SYSTEMS**

**L T P/S C**

**3 0 0 3**

**OBJECTIVES:**

- Expose the students with concepts of cartography as major components of input and output related to cartography.
- To provide exposure to data models and data structures in GIS and to introduce various Raster and Vector Analysis capabilities.
- To expose the concept of quality and design of cartographic outputs in open GIS environment.

**UNIT I FUNDAMENTALS OF CARTOGRAPHY AND GIS 9**

Definition of Map - Mapping Organization in India- Classification based on Function, Scale, Characteristics – Ellipsoid and Geoid – Co-ordinate Systems - Rectangular and Geographic Coordinates – UTM and UPS - Projection – Function - Types of Map Projections – Transformations – Function - Affine transformation - Choice of Map Projection – Evolution of cartography- Geo-Spatial, Spatial and Non-spatial data – Definition of GIS – Evolution GIS – Components of GIS.

**UNIT II GIS DATA MODELS AND DATA INPUT 9**

Point, Line Polygon / Area, elevation and surface – Tessellations - Attributes and Levels of Measurement - Data Sources – Ground and Remote Sensing survey – Collateral data collection – Input: Map scanning and digitization, Registration and Geo-referencing – Concepts of RDBMS - Raster Data Model – Grid – Data Encoding - Data Compression – Vector Data Model – Topological properties – Arc Node Data Structure – Raster Vs. Vector Comparison – File Formats for Raster and Vector – Data conversion between Raster and vector.

**UNIT III RASTER AND VECTOR DATA ANALYSIS 9**

Raster Data analysis: Local, Neighborhood and Regional Operations – Map Algebra – Vector Data Analysis: Topological Analysis, point-in-polygon, Line-in-polygon, Polygon-in-Polygon – Proximity Analysis: buffering, Thiessen Polygon – Non-topological analysis: Attribute data Analysis- concepts of SQL– ODBC UNIT IV NETWORK ANALYSIS AND SURFACE ANALYSIS 9 Network – Creating Network Data - Origin, Destination, Stops, Barriers – Closest Facility Analysis, Service Area Analysis, OD Cost matrix analysis, Shortest Path Analysis – Address Geocoding – Surface Analysis – DEM, DTM - Point data to Surface interpolation – DEM Representation - Applications

**UNIT V DATA OUTPUT AND WEB BASED GIS 9**

Map Compilation – Cartographic functionalities for Map Design – Symbolization – Conventional signs and symbols – Spatial Data Quality – Lineage, Positional Accuracy, Attribute Accuracy, Completeness, Logical Consistency - Meta Data – Web based GIS: Definition, Merits - Architecture – Map Server – Spatial Data Infrastructure – Spatial Data Standards

**TOTAL: 45 PERIODS**

**OUTCOMES:**

On completion of this course, the student shall

- Acquire knowledge about cartographic principles, spatial data models and spatial analysis.
- Understand the cartographic outputs in open GIS environment.

**REFERENCES:**

1. C.P. Lo, Albert K.W. Yeung, Concepts and Techniques of Geographic Information Systems, 2nd Edition, Prentice Hall, 2006, ISBN-13: 9780131495029
2. John Jensen, Ryan Jensen, Introductory Geographic Information Systems, International Edition, Pearson Publishers, 2012, ISBN-10: 0136147763, ISBN-13: 9780136147763
3. Kang-tsung Chang, Introduction to Geographic Information Systems with Data Set CDROM, 6th Edition, Mc Graw Hill, 2013, ISBN-10: 0077805402, ISBN-13: 978-0077805401

**RE5001**

**GLOBAL REAL ESTATE MANAGEMENT**

**L T P/S C  
3 0 0 3**

**OBJECTIVES**

- To understand the rationale, opportunities and risks of international real estate investing
- To analyse the macro factors that influence the performance of real estate markets across countries

<b>UNIT I</b>	<b>GLOBAL REAL ESTATE MARKETS</b>	<b>9</b>
Rationales for Cross Border RE Investing - Facilitators of Real Estate Globalization: public markets, professionalization -Types of Global Real Estate Investors and Developers -Understanding Global Linkages -Rewards of International RE Investing -Risks and Costs of Cross-border Investing: transaction and information costs, political risk, transparency, currency risk, liquidity, reputation		
<b>UNIT II</b>	<b>INVESTMENT FORMATS</b>	<b>9</b>
Developer equity/ Types of Debt Private Equity: Comingled and Direct Different Types of Direct Development Strategies; Rationales Operational and Execution Issues		
<b>UNIT III</b>	<b>PROJECT LEVEL ANALYSIS</b>	<b>9</b>
Opportunities and Constraints in Emerging Markets - Property rights and registration - Approvals/ Permits Pro-formas - Due diligence - Structures for Development Finance - Risk Return Analysis -Exit Strategies		
<b>UNIT IV</b>	<b>BALANCING RISKS AND REWARDS</b>	<b>9</b>
Comparing domestic and international returns - Cross-border: Compensation for Transaction costs, Tax Liabilities, Currency Risk, Transparency, JV costs		
<b>UNIT V</b>	<b>PROPERTY MARKET FUNDAMENTALS</b>	<b>9</b>
Opening up New Markets Demand analysis for different types of RE - Property Market: Cyclical Rationales Capital Markets Supply constraints real side: land, infrastructure, finance Government Policies: Subsidies, Taxation, Regulation Risk Analysis		

**TOTAL: 45 PERIODS**

**OUTCOMES**

- Students will be equipped to critically analyse market specific factors that impact RE investment performance (property rights, taxes, transparency, planning procedures)
- Students will gain expertise on qualitative aspects of identifying and achieving successful projects.
- Expose students to the world of cross-border real estate development and investment with a focus on emerging market economies.

**REFERENCES**

1. Brown, G. & Matysiak, G., (2000) Real Estate Investment, FT/Prentice Hall.
2. Edwards V and Ellision L, (2003) Corporate Property Management: Aligning Real Estate with Business Strategy, Blackwell
3. Haynes B and Nunnington N, (2009) Corporate Real Estate Asset Management: Strategy and Implementation, EG Books
4. Hoesli, M., Lekander, J. and Witkiewicz, W., (2004) International evidence on real estate as a portfolio diversifier, Journal of Real Estate Research, Vol. 26, pp. 161-206
5. Sirmans C. F. and Worzala E. (2003), International Direct Real Estate Investment: A Review of the Literature, Urban Studies, Vol. 40, Nos 5–6, 1081–1114

<b>EA5192</b>	<b>ENVIRONMENTAL IMPACT ASSESSMENT</b>	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**OBJECTIVES:**

- To expose the students to the need, methodology, documentation and usefulness of environmental impact assessment and to develop the skill to prepare environmental management plan.

**UNIT I INTRODUCTION 07**  
 Historical development of Environmental Impact Assessment (EIA). EIA in Project Cycle. Legal and Regulatory aspects in India. – Types and limitations of EIA – Cross sectoral issues and terms of reference in EIA – Public Participation in EIA.-EIA process- screening – scoping - setting – analysis – mitigation

**10**

**UNIT II COMPONENTS AND METHODS**  
 Matrices – Networks – Checklists – Connections and combinations of processes - Cost benefit analysis – Analysis of alternatives – Software packages for EIA – Expert systems in EIA. Prediction tools for EIA – Mathematical modeling for impact prediction – Assessment of impacts – air – water – soil – noise – biological — Cumulative Impact Assessment – Documentation of EIA findings – planning – organization of information and visual display materials – Report preparation. EIA methods in other countries.

**UNIT III IMPACT ON SOCIO-ECONOMIC SYSTEMS 08**  
 Definition of social impact assessment. Social impact assessment model and the planning process. Rationale and measurement for SIA variables. Relationship between social impacts and change in community and institutional arrangements. Individual and family level impacts. Communities in transition - neighborhood and community impacts. Selecting, testing and understanding significant social impacts. Mitigation and enhancement in social assessment. Environmental costing of projects.

**UNIT IV ENVIRONMENTAL MANAGEMENT PLAN 10**  
 Environmental Management Plan - preparation, implementation and review – Mitigation and Rehabilitation Plans – Policy and guidelines for planning and monitoring programmes – Post project audit – Ethical and Quality aspects of Environmental Impact Assessment.

**UNIT V SECTORAL EIA 10**  
 EIA related to the following sectors - Infrastructure – construction and housing Mining – Industrial - Thermal Power - River valley and Hydroelectric – coastal projects-Nuclear Power, Hill area Development and CRZ.-EIA for coastal projects.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- The students gain an understanding about the significance of environmental impact assessment.
- The students can develop the skills to prepare environmental management plan.

**REFERENCES:**

1. Canter, L.W., Environmental Impact Assessment, McGraw Hill, New York. 1996.
2. Lawrence, D.P., Environmental Impact Assessment – Practical solutions to recurrent problems, Wiley-Interscience, New Jersey, 2003.
3. Nick Harvey, Beverley Clarke, Environmental Impact Assessment: Procedures and Practices, Oxford University Press, USA, 2012.
4. Petts, J., Handbook of Environmental Impact Assessment, Vol., I and II, Blackwell Science, London, 1999.
5. World Bank –Source book on EIA.

**MH5221 PERFORMANCE EVALUATION OF BUILDINGS L T P/S C**  
**2 0 2 3**

**OBJECTIVES**

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

- UNIT I INTRODUCTION TO BUILDING PERFORMANCE EVALUATION 6**  
Emerging role of performance evaluation in building design and master planning- Performance audit and rating systems- GRIHA, LEED IGBC and BREAM Comparative analysis of green rating systems – Architectural Computation and performance audit- Introduction to Building performance simulation tools
- UNIT II ENVIRONMENTAL ASSESSMENT METHODS AND MODELING FOR PASSIVE SYSTEMS 15**  
Modeling and experimental techniques for building assessment/ evaluation and design – Basics of thermal comfort, solar shading/access/ control, day lighting, acoustics, air movement etc. – issues and opportunities with current assessment modes/ evaluation tools- Evaluation and assessment based on Building type/ function and program – Building performance with respect to function, program, micro climate, urban planning, envelope design, material – Computer studio and simulation-Mathematical models of heat and mass transfer phenomena through building components: transfer function methods and numerical methods – Models of radiative and convective heat transfer phenomena within buildings.
- UNIT III POST OCCUPANCY EVALUATION OF BUILDINGS 15**  
Purpose and components of Post occupancy evaluation (POE), Building performance benchmarks, Occupant satisfaction, Indoor air quality, PPD & PMV analysis, Techniques and methods for post occupancy evaluation, Assessing existing buildings based on their energy and water usage.
- UNIT IV ADVANCE BUILDING SIMULATION AND ENERGY MODELLING 15**  
Integration of simulation tools with BIM, RAPID ENERGY MODELLING - Modelling and performance simulation of existing buildings – residential-institutional- design of a new residential building using energy simulation tools
- UNIT V SEMINAR AND CASE STUDY PRESENTATION 9**  
Case study presentation of students on performance evaluation of a building identified by them and approved by the course faculty – Seminar on topics approved by the course faculty.

**TOTAL: 60 PERIODS**

### **OUTCOMES**

- The students will gain knowledge on environmental assessment methods, audit and simulation techniques.
- Will add value to architectural design processes and equip students with energy modeling skills.

### **REFERENCES**

1. Clarke, J.A., “Energy simulation in building design”, Adam Hilger Ltd, Bristol, 1985
2. Energy Audit of Building Systems – Moneef Krarti (Ph.D) – CRC Press 2000
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. Givoni Baruch, “Passive and Low Energy Cooling of Buildings”, Van Nostrand Reinhold, New York, 1994.
5. <https://www.designbuilder.co.uk>
6. <https://www.iesve.com/>



7. Kabele, K., "Modeling and analyses of passive solar systems with computer simulation", in Proc. Renewable energy sources, PP. 39 – 44, Czech Society for Energetics Kromeriz 1998 (in Czech)
8. Robert B. Bechtel and Arza Churchman "Handbook of Environmental Psychology", John Wiley & Sons Inc., New York 2002.

**RE5002**

**REAL ESTATE MARKETING**

**L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To facilitate understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints.
- To understand the real estate business with particular emphasis on the sales and marketing aspects of property life cycle
- To identify customer needs and assess their risk appetite

**UNIT I INTRODUCTION TO MARKETING 9**

Concept, nature, scope and importance of marketing; Marketing concept and its evolution; Marketing mix; Strategic marketing planning – an overview. Market Analysis and Selection: Marketing environment – macro and micro components and their impact on marketing decisions; Market segmentation and positioning; Buyer behavior; consumer versus organizational buyers; Consumer decision making process. Branding & franchising

**UNIT II BRANDING AND PRICING 9**

Branding – strategic implications, New product development and consumer adoption process. Pricing Decisions, Factors affecting price determination, Pricing policies and strategies; Discounts and rebates.

The traditional marketing process and consumer behaviour - Marketing of residential property and agencies-Consumer behavior.

**UNIT III DISTRIBUTION CHANNELS 9**

Distribution Channels and Physical Distribution Decisions: Nature, functions, and types Retailing and wholesaling. Promotion Decisions: Communication Process; Promotion mix – advertising, personal selling, sales promotion, publicity and public relations; Advertising effectiveness; Sales promotion – tools and techniques.

**UNIT IV MARKETING RESEARCH 9**

Marketing Research: Meaning and scope of marketing research; Marketing research process. Marketing Organisation and Control: Organising and controlling marketing operations

**UNIT V ISSUES AND DEVELOPMENTS IN MARKETING 9**

Social, ethical and legal aspects of marketing; Marketing of services; International marketing; Green marketing; Cyber marketing; Relationship marketing and other developments of marketing.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- The student will acquire in depth knowledge in various types of marketing
- The student gain expertise in organising and controlling marketing operations

**REFERENCE:**

1. Real Estate Sales & Marketing , 3rd Edition, Rosenauer & Mayfield, Thomson Southwestern.

**RE5003**

**CAPITAL MARKETS AND REAL ESTATE**

**L T P/S C**  
**3 0 0 3**

**OBJECTIVES**

- To understand the implications of the Capital Markets on the Real Estate Sector
- To use the case study based approach to examine investment strategies.
- To sensitise on the concepts of development of real estate investment trusts (REIT)

**UNIT I**

**9**

Globalization of capital markets – impact on real estate finance and investment – institutional investors

**UNIT II**

**9**

Capital theory and trade-offs over time – financial markets and economic efficiency – discounting – present value – compound interest arithmetic

**UNIT III**

**9**

Financial Markets – Investment strategies – market hypothesis – innovations – Tobin's Q – Portfolio selection. Investment Criteria – Present value – internal rate of return

**UNIT IV**

**9**

Capital asset pricing theory – Asset allocation strategies – risk diversification – multi asset portfolios – benefits of capital market integration

**UNIT V**

**9**

Development of real estate investment trusts (REIT) industry – development of market for real estate debt securities.

**TOTAL: 45 PERIODS**

**OUTCOMES**

- To give an understanding of the real estate market which is driven by Capital Intensive Economy.
- To emphasise the concept of real estate investment trusts (REIT) industry & development of market for real estate debt securities.

**RE5004**

**REAL ESTATE ECONOMICS**

**L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- Understanding the social values and life styles.
- Urbanization and socio – economic issues of employment, demand for space in human settlements.
- Appreciating the formal and informal mechanism in real estate resulting out of socio economic characteristics.

**UNIT I BASIC PRINCIPLES AND CONCEPTS OF REAL ESTATE ECONOMICS**

**10**

Basic concepts in the study of the society – ethnic groups – social groups – social institutions – social stratification - order and change – social control - Effects of physical environment on behavior. Sociology of India – Basic features of the Indian Society and culture – language, religion, caste and tribes. Social problems of the urban community – crime, delinquency and violence.

**UNIT II IMPLICATIONS OF NATIONAL AND GLOBAL ECONOMY**

**6**

Rural community and relationship with the urban community. Neighbourhood concepts – implications & limitations in the Indian context.

**UNIT III ECONOMIC DEVELOPMENT & ROLE OF THE GOVERNMENT 10**  
 Theory of income, employment, money, national income (GNP, NNP), -Fiscal policy – inflation – Indian financial institutions. Problems of economic growth, development, characteristics of under – developed economics, balanced growth and industrialization, population problems, technological change and innovations, long term economic plans, economics of urbanization and real estate.

**UNIT IV URBAN AND INDUSTRIAL SOCIOLOGY 9**  
 Urbanisation and its social aspects – rural – urban migration, Concept of industrial society, social aspects of industrialization.

**UNIT V ENTREPRENEURSHIP AND INNOVATION IN REAL ESTATE 10**  
 Information Technology, and Technical Progress - Entrepreneurship, Organization, and Innovation - Natural Resources and the Environment: Toward Sustainable Development.

**TOTAL: 45 PERIODS**

**OUTCOMES:**

- The students will understand the implications of Global and National economic situations on the real estate industry.
- Students will gain exposure on aspects of FDI in the Real Estate Field
- Students will gain knowledge on aspects of Inflation, Monetary Policy, Fiscal Policy helps to understand the economy in Real Estate Development

**REFERENCES**

1. C.N. Shankar Rao - Sociology – An Introduction to Social Thought (2002).
2. Chand & Co. New Delhi Introduction to Sociology, Kitab Mahal New Delhi, Vidya Bhusan & D.R.Sachadew (2005).
3. Jens Beckert, “International Encyclopedia of economic sociology”, (2006), Routledge, Oxford, U.K.
4. K.K DEWETT, Modern Economic Theory (2002), Shyamal Charitable Trust, New Delhi.
5. Raghbendra Jha, “Modern Public Economics”, (1997), Routledge, Oxford, U.K.

**RE5005 ECOLOGY AND LANDSCAPE L T P/S C**  
**3 0 0 3**

**OBJECTIVES:**

- To understand the Fundamentals of Ecology and Ecological process.
- To develop skills in EIA & Application of the techniques to large scale developments.
- Reclamation & restoration of derelict areas conservation and preservation of fragile and eco-sensitive areas.

**UNIT I 9**  
 Ecology –\_Fundamentals of ecology - ecological processes – ecology of growth – ecological communities – limiting factors – ecosystem inertia and resilience

**UNIT II 9**  
 Landscape Planning & Developmental Projects – Impact of human activities – Introduction to EIA – Application of the techniques to large scale developments

**UNIT III 9**  
 Landscape planning and Recreation - National parks – protective designations – bio-diversity – biosphere reserves – concepts of eco-tourism – sustainable tourism.

**UNIT IV****9**

Landscape assessment techniques – Basic quantitative methods of collecting, analyzing – projecting and presenting data – landscape planning – visual assessment – aesthetic dimension

**UNIT V****9**

Landscape Conservation – Reclamation – restoration of derelict areas – conservation and preservation of fragile and eco-sensitive areas – case studies.

**TOTAL: 45 PERIODS****OUTCOMES:**

- The student will be equipped with landscape assessment techniques to deal with landscape planning for large scale projects.
- The students will be able to apply principles learned through case studies of reclamation, restoration and conservation of fragile areas.

**REFERENCES:**

1. Ervin H. Zube, Robert O Brush, Julios G.Y.Fabos, Landscape assessment values, perceptions, 1975.
2. G. Tyler Miller Jr., Living in the Environment: Principles, Connections, and Solutions, Brooks / Cole Publishers co., 2004.
3. Richard T.T.Forman & Michel Godron , Landscape Ecology, John Wiley & Sons; 1986
4. Tom Turner, Landscape Planning and Environmental Impact Design, UCL Press, London, 1998.
5. William M. Marsh, Landscape planning – Environmental Application, John Wiley and sons Inc., 1997.

**MH5281****BUILDING INFORMATION MODELING****L T P/S C  
0 0 6 3****OBJECTIVE**

- To equip students with skills and information to build comprehensive Building Information Models (BIM) using appropriate Digital software and Media.

**UNIT I INTRODUCTION TO THE FUNDAMENTALS****15**

Key concepts of BIM - reading and manipulating the software Interface - navigating within views - selection methods - the importance of levels and grids- creating walls, doors, windows, and components - working with essential modification commands and load family. Creating floors, ceilings, and stairs - working with type and instance parameters - importing CAD drawings - understanding the project browser and type properties palettes - adding sheets - inserting views onto sheets - adding dimensions and text to the mode and plotting

**UNIT II ADVANCED MODELING –FAMILY TYPES AND TOPOSURFACE MODELLING****20**

Creating curtain walls, schedules, details, a custom family, and family types - “flex” a family with family types and work with reference planes - creating rooms and an area plan - tag components - customize existing wall styles. Create and edit a toposurface, add site and parking components - draw label contours - work with phasing - understand groups and links - work with stacked walls - and learn the basics of rendering and create a project template.

**UNIT III RENDERING AND MATERIAL APPLICATION 20**  
 Choosing material for buildings- Creating custom walls, floors, and roofs - keynoting - working with mass elements - enhancing rendering with lighting - producing customized materials - Using sun and shadow settings - Walkthrough technique - adding decals - working with design options and worksets - and calculating energy analysis - managing revisions

**UNIT IV BIM FOR BUILDING ENERGY SIMULATION 30**  
 Energy simulation for conceptual BIM models using massing- Detailed modeling using design elements- Rapid energy modeling and simulation with Autodesk® Revit® Conceptual Energy Analysis features to simulate performance from within Revit Architecture -Use Autodesk® Green Building Studio® to produce energy consumption, carbon neutrality and renewable potential reports.

**UNIT V BIM FOR COST ESTIMATING, PROJECT PHASING AND ADMINISTRATION 5**  
 Introduction and theoretical information on the following topics- Model based Cost Estimating - Challenges in cost estimating with BIM- Cad geometrics vs BIM element description- Visual data models - Material substitutions and value engineering- detailed estimates and take off sheets- XML and automated cost estimate- project phasing and management- 4D modeling -BIM for project lifecycles.

**TOTAL: 90 PERIODS**

**OUTCOMES**

- This is a project-based course where students gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations.
- The students will learn about how to use BIM for building energy performance simulation, construction administration

**REFERENCES**

1. Eastman, C.; Teicholz, P.; Sacks, R.; Liston, K. (2008) BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. New York: Wiley.
2. Ray Crotty;(2011) The Impact of Building Information Modelling: Transforming Construction. Spons Architecture Price Book.

**MH5071 WEB DESIGN AND PORTFOLIO PRODUCTION L T P/S C**  
**0 0 6 3**

**UNIT I INTRODUCTION TO WEB DESIGN 15**  
 Basics of web design – Introduction to software used for web design – ADOBE IMAGE READY, DREAMWEAVER, FLASH etc.

**UNIT II STATIC PAGES 15**  
 Slice – URL in ADOBE IMAGEREADY. Creation and Editing of site map – layer, tables, frameset, - CSS style – Forms – tools like insert, roll over etc., in DREAMWEAVER

**UNIT III ANIMATION IN FLASH 15**  
 Introduction to MACROMEDIA FLASH, importing other file formats to Flash- saving and exporting Flash files, Frame by frame animation – Motion Tweening – Shape Tweening

**UNIT IV INTRODUCTION TO SCRIPTING 15**  
 Using Timeline – Frames –Key frames- Creating and using Symbols- Simple scripting in flash – Publishing SWF files

**UNIT V          DEVELOPING A WEB SITE****30**

Using the skills and concepts learnt with the ADOBE IMAGEREADY,DREAMWEAVER, FLASH softwares . students will develop their portfolio in the form of web pages. These pages have to be uploaded in free public domains.

**TOTAL: 90 PERIODS****REFERENCES**

1. Adobe Dreamweaver CS6 classroom in a book, Adobe creative team, 2012.
2. Adobe Flash CS3 professional on demand by Steve Johnson, Andy Anderson, Perspection inc, 2012.
3. Adobe Photoshop CS3 studio techniques, Ben Wilmore, 2012.
4. Flash Web Design, The Art of Motion Graph, Curtis Hillman, New Riders Publishing, Indianapolis, IN. U.S.A, 2000
5. M.E. Morris, and R.J. Hinrichs, Web Page Design, Prentice Hall, 1996.
6. Mark Von Wodtke, Mind over Media : Creative Thinking Skills for Electronic Media, McGraw-hill, New York, 1993
7. Photoshop 7 Bible Professional Edition, Wiley John & Son INC, New York, DekeMcClelland, 2000.