



**PERIYAR
MANIAMMAI**
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
think • innovate • transform

Criterion 1 – Curricular Aspects

Key Indicator	1.1	Curriculum Design and Development
Metric	1.1.3	Average percentage of courses having focus on employability/ entrepreneurship/ skill Development offered by the department.

DEPARTMENT OF ARCHITECTURE

SYLLABUS COPY OF THE COURSES HIGHLIGHTING THE FOCUS ON EMPLOYABILITY/ ENTREPRENEURSHIP/ SKILL DEVELOPMENT

- List of courses for the programmes in order of

S. No.	Programme Name
i.	Bachelor of Architecture
ii.	Bachelor of Design (Interior Design)
iii.	Master of Architecture

- Syllabus of the courses as per the list.

Legend : Words highlighted with **Blue Color** - Entrepreneurship
 Words highlighted with **Red Color** - Employability
 Words highlighted with **Purple Color** - Skill Development

1. List of courses for the B.Arch, B.Des., M.Arch, programmes

Name of the Course	Course Code	Year of introduction	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development
History of Architecture – I	XAR101	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Theory of Architecture – I	XAR102	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Communication skills	XAR104	2019-20	SKILL DEVELOPMENT - Discussion, Writing, Speaking and Test
Architectural Graphics –I	XAR105	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Visual Arts	XAR106	2007-08	SKILL DEVELOPMENT -Sheets, Model and Sketches
Basic Design	XAR107	2007-08	SKILL DEVELOPMENT -Sheets, Model and Sketches
History of Architecture – II	XAR201	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Theory of Architecture – II	XAR202	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Mechanics of Structures – I	XAR203	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Architectural Graphics – II	XAR204	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Materials and Construction –I	XAR205	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Carpentry and Model making workshop	XAR206	2021-22	SKILL DEVELOPMENT -Sheets, Model and Sketches
Architectural Design – I	XAR207	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
History of Architecture – III	XAR301	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Site Surveying and Planning	XAR302	2021-22	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Mechanics of Structures – II	XAR303	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Building Services – I	XAR304	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Materials and Construction –II	XAR305	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Computer Applications in Architecture - I	XAR306	2007-08	SKILL DEVELOPMENT -Sheets, Model and Sketches
Architectural Design – II	XAR307	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
History of Architecture – IV (Western)	XAR401	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Climate and Architecture	XAR402	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Design of Structures – I	XAR403	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test

Building Services – II	XAR404	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Materials and Construction – III	XAR405	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Elements of Aeronautics	XASOE1	2019-20	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Remote Sensing and GIS	XCEOE1	2019-20	SKILL DEVELOPMENT - Sheets, Model and Sketches
Building Services	XCEOE2	2019-20	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Multimedia Design and Development	XCSOE4	2019-20	SKILL DEVELOPMENT - Sheets, Model and Sketches
Product Design and Development	XMEOE1	2019-20	SKILL DEVELOPMENT - Sheets, Model and Sketches
Renewable Energy Sources	XMEOE2	2019-20	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Creativity Through Language	XENOE2	2019-20	SKILL DEVELOPMENT - Discussion, Writing, Speaking and Test
Architectural Design – III	XAR407	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Contemporary Architecture	XAR501	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Environmental Sciences	XAR502	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Design of Structures – II	XAR503	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Building Services – III	XAR504	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Materials and Construction- IV	XAR505	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Computer Applications in Architecture - II	XAR506	2019-20	SKILL DEVELOPMENT - Sheets, Model and Sketches
Architectural Design – IV	XAR507	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Vernacular Architecture	XAR601	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Digital Design Processes in Architecture	XAR602B	2015-16	SKILL DEVELOPMENT - Sheets, Model and Sketches
Architecture and Structure	XAR602C	2020-21	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Estimation, Costing & Valuation	XAR603	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Glass in Architecture	XAR604A	2020-21	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Advanced Building Technology	XAR604C	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Building Automation and Management	XAR604D	2020-21	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates
Materials and Construction – V	XAR605	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and plates

Architectural Working Drawing and Specifications	XAR606	2015-16	SKILL DEVELOPMENT -Sheets, Model and Sketches
Architectural Design – V	XAR607	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Urban Economics & Sociology	XAR701	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Advanced Building Technology	XAR703B	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Architecture and Structure	XAR703C	2020-21	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Interior design and detailing	XAR704B	2015-`16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Disaster Resistance in Architecture	XAR704C	2015-`16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Seminar	XAR705	2015-16	SKILL DEVELOPMENT -Sheets, Model and Sketches
Architectural Design – VII	XAR706	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Practical Training	XAR801	2007-08	ENTREPRENEURSHIP Students work as an intern for six months in a reputed architectural firm getting involved in real time architectural design projects and their execution.
Professional Practice and Ethics	XAR901	2007-08	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Housing	XAR902	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Architectural Conservation	XAR903A	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Theory of Design	XAR903D	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Landscape Architecture	XAR904B	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Behavioral studies in Built Environment	XAR904C	2015-16	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Dissertation	XAR905	2015-16	EMPLOYABILITY - Real time study , analysis and proposal for societal need projects
Architectural Design – VIII	XAR906	2007-08	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Thesis	XAR1001	2007-08	ENTREPRENEURSHIP - Students select individual project and design based on the study of Special study, Literature study, Case study, Site analysis, Concept development, plan, elevation, sections, views . models
Practical Training	XID701	2018-19	ENTREPRENEURSHIP Students work as an intern for six months in a reputed architectural firm getting involved in real time architectural design projects and their execution.

Thesis	XID801	2018-19	ENTREPRENEURSHIP - Students select individual project and design based on the study of Special study, Literature study, Case study, Site analysis, Concept development, plan, elevation, sections, views . models
Emerging Practices in Housing	YAR101	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Appropriate Materials and Technology for Sustainable Architecture	YAR102	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Advanced Studies in Regional and Vernacular Architecture	YAR103	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Services in High rise Buildings	YAR104	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Architectural Design Studio –I	YAR105	2012-13	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Contemporary Theories and Trends	YAR201	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Research Methodology	YAR202	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Advanced Materials and Construction Technology	YAR203	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Digital Design Process in Architecture	YAR204	2012-13	SKILL DEVELOPMENT -Sheets, Model and Sketches
Building Management Systems	YAR205	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Architectural Design studio II	YAR206	2012-13	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Sustainable Urban Landscape	YAR301	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Heritage Conservation Planning	YAR302	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Urban Design Practices	YAR303	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Energy Simulation and Modelling	YAR304B	2012-13	EMPLOYABILITY - Assignments, Sketches, Site visit, Model and Test
Dissertation	YAR305	2012-13	EMPLOYABILITY - Real time study , analysis and proposal for societal need projects
Architectural Design Studio –III	YAR306	2012-13	ENTREPRENEURSHIP - Sheets, Sketches, Literature study, Case study and Models, Plan, Elevations, Sections and Views
Thesis	YAR401	2012-13	ENTREPRENEURSHIP - Students select individual project and design based on the study of Special study, Literature study, Case study, Site analysis, Concept development, plan, elevation, sections, views . models
HOUSING JUSTICE : A VIEW FROM INDIAN CITIES	YAR ON05	April 2022	EMPLOYABILITY : Case study

Sustainable Urban Land Use Planning	YARON06	April 2022	EMPLOYABILITY: Case study
Upgrading Urban Informal Settlements	YARON07	April 2022	EMPLOYABILITY: Case study

B. ARCH – SYLLABUS

XAR - 101 - HISTORY OF ARCHITECTURE - IV

3 – 0 – 0 – 3

Course objectives:

1. To understand the architectural development in Western world during medieval period.
2. To understand the factors that influence the emergence or decline of any architectural style

Course Outcome:		Domain	Level
<i>On the successful completion of the course, students will be able to</i>			
CO1	Analyze the continuity between each style – the factors that connect each style	Cognitive	Analyze
CO2	Explain the architectural characters of Medieval Europe through selected examples.		Knowledge
CO3	Analyze the trend or the pattern of development of architectural styles.		Analyze
CO4	Understand the contemporary architectural style and its development leading to new styles.		Understand

SUBCODE	SUB NAME	L	T	P	C
XAR 101	HISTORY OF ARCHITECTURE - IV	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I	ROMANESQUE	10			
	Architectural characters of Italy, France and England during Romanesque period - Examples: Pisa Complex, Italy- Abbey Aux Hommes, Caen, France - Tower of London, London, England				
UNIT – II	GOTHIC	12			
	Outline of Architectural character in Italy, France and England during Gothic period - Examples: France - Notre Dame in Paris, Reims Cathedral, Beauvais Cathedral, England- Westminster Abbey, Hampton Court Palace, London, Italy - Doges Palace, Venice, Milan Cathedral. Evolution of vaulting and development of structural systems.				
UNIT – III	RENAISSANCE	11			
	The idea of rebirth and revival and sociological influences in art and architecture - Emergence of merchant communities and their patronage. Different phases of Renaissance style in Italy, England and France. Typical Renaissance structures - Palaces in Italy, Domestic Architecture in England and Chateaux of France.				
UNIT – IV	RENAISSANCE ARCHITECTS	12			
	Study of life history, philosophy and contributions of the Renaissance architects in Europe.				
	Italy - Brunelleschi, Donatello, Raphael, Michelangelo and Andrea Palladio				
	England - Sir Christopher Wren, Inigo Jones and John Webber				
	France - Pierre Lescot, Philibert de l'Orme, and Jean Bullant				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	

TEXT

1. Sir Bannister Fletcher, A History of Architecture, University of London, The Antholone Press, 1986.

REFERENCES

1. Skpiro Kostof, A History of Architecture - Settings and Rituals, Oxford University Press, London, 1985.
2. S.Lloyd/H.W.Muller, History of World Architecture - Series, Faber Ltd., London, 1986.
3. Pier Luigi Nervi, History of World Architecture Series. Harry N. Abrame Inc. Publication, New York, 1972.

WEBSITES

1. <http://www.clr.toronto.edu> - virtual lib.
2. <http://www.lib.virginia.edu/> - Renaissance and baroque
3. <http://2.sjis.umich.edu/> - Image browser

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO 1	PSO 2
CO1	2	-	1	-	-	-	-	-	-	1	-	-
CO2	2	-	1	-	-	-	-	-	-	1	-	-
CO3	2	-	1	-	-	-	-	-	-	1	-	-
CO4	2	-	1	-	-	-	-	-	-	1	-	-
Total	8	-	4	-	-	-	-	-	-	4	-	-
Scale d Value	2	-	1	-	-	-	-	-	-	1	-	-

1-5 =1, 6-10=2, 11-15=30 0-No relation, 1 –Low Relation, 2 –Medium Relation, 3 –High Relation.

SUBCODE	SUB NAME	L	T	P	C
XAR 102	THEORY OF ARCHITECTURE-I	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I	WHAT IS ARCHITECTURE ?				5
	Few definitions to architecture.				
	Objective, scope and need for architecture. Its applications.				
UNIT – II	ARCHITECTURE IS A MULTIDISCIPLINARY FIELD (OCCUPATION)				5
	The functional and aesthetic components of architecture.				
	The relationship between architecture and technology.				
	The relationship between architecture and fine arts.				
	Design process: Intuition vs analysis and synthesis (artistic vs scientific)				
UNIT – III	AESTHETIC COMPONENT				15
	Form & space: Unity of opposites, Shapes, visual and emotional effects of geometric forms - The sphere, the cube, the pyramid, the cylinder and cone and their derivatives, Subtractive & additive forms – linear, radial, centralized, clustered, grid.				
UNIT – IV	ARCHITECTURAL SPACE				10
	Space defining elements: Vertical, horizontal and curved elements.				
	Spatial relationship: space within a space, interlocking spaces, adjacent spaces, spaces linked by common spaces.				
	Spatial organization: influencing factors and their types: centralized, linear, radial, cluster, grid with examples.				
UNIT – V	PRINCIPLES OF DESIGN				10
	Proportion: Need for proportion, Golden Proportion, Modular. Indian proportion and Japanese Proportions.				
	Scale: The need for scale, human scale and generic scale.				
	Ordering Principles: Balance, Rhythm, Symmetry, datum, hierarchy, pattern and axis citing				

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. V.S.Pramar, Design Fundamentals in Architecture, Samaiya Publications Private Ltd., New Delhi, 1973.

REFERENCES

1. Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994.
2. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979.
3. Helm Marie Evans and Caria David Dunneshil, An initiation to design, Macmillan Publishing Co. Inc., New York .

AR 104 - ARCHITECTURAL GRAPHICS – I

1 – 0 – 2 – 4

Course Objectives:

1. To prepare students for three-dimensional visualization and representation of complex geometrical objects in the form of two and three dimensional drawings.
2. To educate students with the basics of drafting tools and their application in the process of drawing preparation.
3. To educate students with concepts and fundamentals of architectural drawings.

Course Outcome:

Domain

Level

On the successful completion of the course, students will be able to

CO1	Understand the concepts of architectural drawings	Cognitive	Knowledge
CO2	Ability to represent complex geometrical forms in two and three dimensional drawings of varied scales.	Psychomotor	Application
CO3	Draw Orthographic projections, Axonometric and Isometric views of three-dimensional objects in varied scales.	Affective	Application

SUBCODE	SUB NAME	L	T	P	C
XAR104	ARCHITECTURAL GRAPHICS - I	1	0	2	4
C:P:A	0.6:1.8:0.6	L	T	P	H
		1	0	2	5
UNIT - I	INTRODUCTION TO GEOMETRICAL DRAWING	15			
	Introduction to fundamentals of geometrical drawing - Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, etc. Use of scales in drawing – plain, diagonal and comparative scales				
UNIT - II	PLANE GEOMETRY	20			
	Construction of planar surfaces - square, circle, curve, polygon etc, Projection of points, lines and planes				
UNIT - III	ORTHOGRAPHIC PROJECTIONS	10			
	Orthographic Projection of solids – simple and complex solids, section of solids, true shape of solids – intersection and interpenetration of solids.				
UNIT - IV	AXONOMETRIC PROJECTIONS	10			
	Introduction to Axonometric projections – Isometric and Oblique projections. Construction of basic shapes and combination of shapes and solids in Isometric projections.				
UNIT - IV	MEASURED DRAWING	20			
	Fundamentals of measured drawing – draw the plan, elevation and section of simple objects - furnitures and building components using suitable scale.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	15	0	60	75	

TEXT

1. I.H.Morris – Geometrical drawing for Art Students. Orient Longman – Madras 1982
2. Albert. O. Halse – Architectural Rendering Techniques McGraw-Hill Book Co. New York 1972

REFERENCES

1. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by American Technical Society, 1966.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.
4. Tokyo Musashino Academy of Art - Introduction to Pencil Drawing, Graphic - Shaw PublishingCo. Ltd., Japan, 1991.

WEBSITES

1. <http://www.cs.brown.edu>
2. <http://www.dtcc.edu/> - document, project info – Arch.dwg.

SUBCODE	SUB NAME	L	T	P	C
XAR 105	COMMUNICATION SKILLS	1	0	1	3
C:P:A	3:0:0	L	T	P	H
		1	0	1	3

UNIT - I INTRODUCTION 9

Listening- short talks, interviews and discussions from various media
Speaking-negotiating meaning, convincing people- describing places
Reading- texts on architecture, Writing process descriptions -Vocabulary Development-Abbreviations and Acronyms. Grammar - Suitable tenses to write descriptions and describe.

UNIT- II SPEAKING, READING AND WRITING 9

Listening –listen to talks for specific information.
Speaking- preparing a presentation using the computer, participating in small group discussion. **Reading**- lengthy articles related to architecture and construction
Writing- writing formal emails, vocabulary appropriate words to describe topics in architecture. Grammar- suitable grammar for writing a report.

UNIT- III DESCRIPTIVE PRESENTATION 9

Listening- Descriptions of place, conversations and answering questions,
Speaking- making a power point presentation on a given topic,
 Reading- architecture manuals, Writing- writing a report, writing essays-descriptive essays, Vocabulary- adjectives of comparison, Grammar - collocations.

UNIT – IV ANALYTICAL PRESENTATION 9

Listening- TED talks, Speaking- participating in group discussions,
Reading- reading and interpreting visual information,
Writing- writing analytical essays and argumentative, Vocabulary- suitable words to be used in analytical and argumentative essays, Grammar - subject-verb agreement.

UNIT – V PROJECT PROPOSAL PRESENTATION 9

Listening- ink talks and longer talks, Speaking- talking about one's project proposal,
Reading- reading essays on construction, buildings, different schools of architecture,
 Writing proposals, Vocabulary- related vocabulary, Grammar- Cohesive devices.

LECTURE	TUTORIAL	PRACTICAL	TOTAL
15	0	30	45

TEXT

1. V.R. Narayanaswamy, Strengthen Your Writing (Orient Longman)
2. Jaya Sasikumar, Champa Tickoo, Writing With A Purpose, Published by Oxford University Press | Paper Back | Language – English
3. *Freeman, Sarah: Study Strategies*, New Delhi: Oxford University Press, 1979.
4. Paul Gunashekar M.L. Tickoo, Reading for Meaning, Published by S. Chand & Company Ltd. Sultan Chand & Company

E – REFERENCES

1. Sharon Hendenreich Springer - English for Architects and civil Engineers -, 2014 ISBN 978-3-658-030-63.

SUBCODE	SUB NAME	L	T	P	C
XAR 106	VISUAL ARTS I	0	0	3	4
C:P:A	1:1.5:1.5	L	T	P	H
		0	0	3	6
UNIT – I	BASICS OF DRAWING				25

Introduction to History of Arts – Artists, Art movements.

Introduction to drawing tools – Quality of lines and expressions – pen, pencil, charcoal, marker, etc. – Exercises to explore the various rendering techniques using various tools.

UNIT – II	FREE HAND DRAWING				30
	Seeing and drawing – Still life and natural objects – exploring the elements of art – line, shape, form, proportion, scale, texture, colour. Exercises to develop the visual perception.				

UNIT –III	PAINTING				35
	Exercises with themes on principles of art and to explore various colour schemes using various mediums – water colour, poster colour, acrylic, oil paint, tools & techniques – brushes, knife, lumograph pen, etc.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		0	0	90	90

TEXT

1. Maitland Graves – The Art of Colour and Design McGraw-Hill Book company Inc. 1951
2. Albert O.Halse, Architectural Rendering, 1990.
3. Ching Francis, “Drawing a Creative Process”, Van Nostrand Reinhold, New York, 1990.
4. Webb, Frank, “The Artist guide to Composition”, David & Charles, U.K., 1994.

SUBCODE	SUB NAME	L	T	P	C
XAR 107	BASIC DESIGN	0	0	6	9
C:P:A	2:1.5:1.5	L	T	P	H
		0	0	6	12
UNIT – I	INTRODUCTION TO DESIGN				30

Definition of design - Design Thinking - Design Process - Design problems and solutions. Exercises using points and lines.

UNIT – II	PRINCIPLES OF VISUAL COMPOSITIONS				50
	Principles of Design and its role in expression (architectural expression)				
	Introduction to principles of organization/composition				
	Repetition, Variety, Radiation, Rhythm, Gradation, Emphasis & Subordination, Proportion, Harmony, Balance, Focal point, Symmetry, Asymmetry, Background, Foreground, Sense of Direction – Exercises to explore the above principles - Symmetrical and asymmetrical compositions and patterns by organization of shapes, expressing themes using geometrical or organic shapes.				

UNIT –III	STUDY OF COLOURS	30
	Study of classification of colours with different hues, values, and shades. Exploring colour theories and applying them in visual composition – Example: Poster design	
UNIT – IV	VISUAL PROPERTIES	20
	Study of Visual Properties - visual textures, optical illusion etc. and apply them in visual composition – Example : Collage	
UNIT –V	FORMS – GEOMETRIC / SCULPTURAL	50
	Exploring the forms - Linear and Planar, fluid and plastic forms using simple material like Match stick, Mount Board, metal foil, wire string, thermocol, clay, plaster of Paris etc. Study of Solids and voids to evolve sculptural forms and spaces, Additive models using similar forms / dissimilar forms, subtractive models from a given geometric form - using various materials and mediums like casting , moulding, etc.,	

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	0	0	180	180

TEXT

1. Maitland Graves – The Art of Colour and Design McGraw-Hill Book company Inc. 1951
2. Albert O.Halse, Architectural Rendering.
3. A techniques of contemporary – presentation McGraw HillBook Company, New York, 1972.
4. Mulick Milind, Water colour, Jyotsna Prakasan, Mumbai 2002.
5. Farey; A. Cyril, Architectural Drawing perspective and Rendering – A Hand book for students and draftsmen
6. John W.Mills - The Technique of Sculpture, B.T.Batsford Limited, New York - Reinhold PublishingCorporation, London, 1966. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
7. C.Lawrence Bunchy - Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y.10001, 1972. Orbid Publishing Ltd., Know how the complete course in Dit and Home Improvements No.22, Bed fordbury, London, W.C.2, 1981.

REFERENCES

1. Edward D.Mills - Planning the Architects Hand Book - Bitterworth, London, 1985.
2. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
3. Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canaa), 1979.

WEBSITES

1. <http://infinet.net> – elements of design
2. <http://www.okino.com> - design, visualization, rendering system.
3. <http://www.interface-signage.com>
4. <http://www.designcommunity.com> – arch rendering, 3D design

SUBCODE	SUB NAME	L	T	P	C
XAR 201	HISTORY OF ARCHITECTURE - II	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I	INTRODUCTION TO INDO ISLAMIC ARCHITECTURE				10

Advent of Islam into the Indian subcontinent and its impact - Factors Influencing Islamic Architecture- socio-cultural, political - Evolution of building types in terms of forms and functions - the Mosque, the Tomb, and Minaret, the Madarasa, the Caravanserai.

Elements and character of Islamic architecture in terms of structure, materials and methods of construction. Elements of decoration, color, geometry, light.

UNIT-II	ISLAMIC ARCHITECTURE-IMPERIAL ERA	12
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Evolution of architecture under the Slave kings – Khalji - Qutub mosque, Qutubminar, Tomb of Nasir - ud - din - Mohammed shah, eg.: Alai Darwaya, Tughlaq - eg. Tomb of Ghiyas - ud - din Tughlaq, Kirki mosque, Delhi., Sayyid and Lodhi Dynasties – tombs in Punjab- eg.: Mothi - Ki - Masjid.

UNIT-III	ISLAMIC ARCHITECTURE - PROVINCES	10
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Evolution of regional architecture and the factors influencing - geographic, cultural, political, etc., - Bengal – Adina mosque, Gujarat - earlier period – Mosque at Broach, Jami Masjid at Ahmedabad, middle period - Mosque at Champanir, Teen Darwaza, later period - Siddisayad mosque, Shah Alam Rauza, Adalaj - step well , Rani Rupavatis Mosque, Jaunpur- Jami Masjid of Jaunpur, Malwa - royal complex at Mandu, Kashmir – Jami Masjid, Srinagar, Deccan (Gulbarga, Bidar, Golconda and Bijapur)

UNIT-IV	MUGHAL ARCHITECTURE	13
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Evolution of Mughal architecture - cities and gardens under the Mugal rulers Babur - eg. Humayuns Tomb – Delhi, Akbar - Agra fort, Fate-pur-sikri - site planning, Jodhabais palace, Birbal palace, Diwan-e- khas, Salim Chisti's Tomb & Buland Darwaza; Jahangir - Akbar's mausoleum at Sikandra, Shahjahan - Red fort, Jami Masjid at Delhi, Taj - Mahal - Agra.

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	0	0	45

TEXT

1. Percy Brown, "Indian Architecture (Islamic Period)", Taraporevala and Sons, Bombay, 1983.
2. Satish Grover, "Islamic Architecture of India", CBS Publishers, New Delhi, 2002.
3. Christoper Tadgell, "The History of Architecture in India from the Dawn of civilization to the End of the Raj", Longmon Group U.K.Ltd., London, 1990.

REFERENCES

1. Christopher Tadgell, "The History of Architecture in India", Penguin Books (India) Ltd, New Delhi, 1990.
2. R.Nath, "History of Mughal Architecture", Vols I to III - Abhinav Publications, New Delhi, 1985.
3. Catherine Asher, "Architecture of Mughal India", Cambridge University Press, 2001.
4. Monica Juneja, "Architecture in Medieval India: Forms, Contexts, Histories", New Delhi, Permanent Black, 2001

SUBCODE	SUB NAME	L	T	P	C
XAR 202	THEORY OF ARCHITECTURE - II	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I	FUNCTIONAL AND AESTHETIC ASPECTS	10			
	The relationship between form and function found in natural objects and their aesthetics. Example flowers, fruits etc.				
	The relationship between form and function found in man-made objects and their aesthetics. Example Knife, Chair etc.				
	The work of an architect: tackling functional aspect and aesthetic aspects.				
	Handling architectural projects: Planning, designing and execution.				
UNIT – II	ANTHROPOMETRICSAND ITS APPLICATION	5			
	Determining size and shape of various activity spaces				
UNIT– III	CLIMATE AND SITE	10			
	The impact of climatology on the design of spaces. Examples from the past and present.				
	The impact of site conditions on the design of spaces. Examples from past and present.				
UNIT – IV	BUILDING MATERIALS AND STRUCTURAL SYSTEM	10			
	The relationship between building materials and structural systems possible by them and the resultant forms. Examples from the past and present.				
UNIT – V	SOCIO PSYCHOLOGICAL ASPECTS	10			
	Believes, values and the aspiration of the user and its impact on architecture. Examples from past and present.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	

TEXT

1. V.S.Pramar, Design Fundamentals in Architecture, Samaiya Publications Private Ltd., New Delhi, 1973.
2. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 1979. Samaiya Publications Private Ltd., New Delhi, 2007.

REFERENCES

1. Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994.
2. Helm Marie Evans and Caria David Dunneshil, An initiation to design, Macmillan Publishing Co. Inc., New York

SUBCODE	SUB NAME	L	T	P	C
XAR 203	MECHANICS OF STRUCTURES - I	3	0	0	3
C: P: A	3:0:0	L	T	P	H
		3	0	0	3
UNIT - I	FORCES AND STRUCTURAL SYSTEMS	8			
	Units of Measurement- Introduction to Scalar and Vector, Types of force systems - Resultant of parallel forces - law of mechanics – coplanar and non-coplanar forces - Resolution and Composition of forces				
UNIT - II	EQUILIBRIUM OF RIGID BODIES	7			
	Principle of moments - principle of equilibrium – Free body Diagram- simple problems, types of supports and their reactions – requirements of stable equilibrium				

UNIT – III	ANALYSIS OF PLANE TRUSSES	10
	Introduction to Determinate and indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints and method of sections.	
UNIT – IV	PROPERTIES OF SECTION	10
	Centroid and Center of Gravity- Moment of Inertia- Polar Moment of Inertia- Product of Inertia- Introduction to Moment of Inertia of Masses with simple problems - Section modules – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis	
UNIT – V	ELASTIC PROPERTIES OF SOLIDS	10
	Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains. Elastic constants - Relation between elastic constants - Application to problems.	

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	0	0	45

TEXT

1. R.K.Bansal – A textbook on Engineering Mechanics. Lakshmi Publications. Delhi 1992
2. R.K.Bansal – A textbook on Strength of Materials Lakshmi Publications. Delhi 1998

REFERENCES

1. P.C.Punmia, Strength of Materials and Theory of Structures; Vol. I, Laxmi publications, Delhi 1994
2. S.Ramamrutham, Strength of materials - Dhanpatrai & Sons, Delhi, 1990.
3. W.A.Nash, Strength of Materials - Schaums Series – McGraw-Hill Book Company, 1989.
4. R.K. Rajput - Strength of Materials, S. Chand & Company Ltd., New Delhi 1996

SUBCODE	SUB NAME	L	T	P	C
XAR 204	ARCHITECTURAL GRAPHICS – II	1	0	2	4
C:P:A	0.6:1.2:0.6	L	T	P	H
		1	0	2	5
UNIT - I	MEASURED DRAWING				25
	Detailed measured drawing/documentation of historic and architectural monument or building of small scale. Complete Documentation including the plan, section, elevation, details of building construction and technology.				
UNIT - II	PERSPECTIVE				30
	Characteristics of Perspective Drawings, Perspective systems and methods. Two point perspective of simple objects, outdoor and indoor view of a building, etc. One point and three point perspective of interiors Perspective theory and practice using scientific methods and short cut methods. Applying rendering techniques.				
UNIT - III	SCIOGRAPHY				20
	Principles of shades and shadows - Shadows of geometrical shapes and solids – construction of sciography on buildings and Shadows of architectural elements, etc.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		15	0	60	75

TEXT

1. Robert. W.Gill – Advanced perspective and Sciography Thames and Hudson London 1974
2. Claude Batley – Indian Architecture Taraporevala sons & co. Bombay.

REFERENCES

1. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
2. George A.Dinsmore, Analytical Graphics - D.Van Nostrand, Company Inc., Canada.
3. John M.Holmes, Applied Perspective, Sir Isaac, Piotman and Sons Ltd., London 1954.
4. Robert W.Gill, Basic Perspective, Thames and Hudson, London, 1974.
5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.
6. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, New York, 1975.
7. Ernest Norling, Perspective drawing, Walter Foster Art Books, California, 1986.
8. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.

WEBSITES

1. <http://www.cs.brown.edu>
2. <http://www.dtcc.edu/-document,projectinfo-Arch.dwg>.

SUBCODE	SUB NAME	L	T	P	C
XAR 205	MATERIALS AND CONSTRUCTION - I	2	0	2	4
C:P:A	1.5:1:0.5	L	T	P	H
		2	0	2	5
UNIT – I	INTRODUCTION				15
	Functional requirements of a building and its components - foundations, plinth, superstructure (framed and load bearing), roofing. Role of soil in building construction – Formation - grain size distribution – soil classification systems. PLATES :Section of a typical wall showing the various components of building ASSIGNMENTS : Drawing the various types of Foundations, Types of structure – load bearing, framed				
UNIT– II	STONE				20
	Classification of rocks - Building stones - their uses –physical properties - brief study of tests for stone – deterioration - preservation of stone - various stone finishes - cutting and polishing of granites. Drawings of foundations - types of masonry - random rubble/Ashlar, etc. - cavity walls - flooring copings, sills, lintels, corbels, arches. Plates & Assignments				
UNIT – II	LIME				5
	Lime - fat/Hydraulic Limes - Their properties and uses – Manufacturing process - Mortar, functions – requirements - mix proportions.				
UNIT – IV	RURAL MATERIALS AND CONSTRUCTION				20
	Mud as a building material - Soil stabilization, soil blocks - foundations - types, S.S.Block – S.S. Cast in situ walls - flooring - roofing - plastering. Bamboo, casuarinas coconut, palm, hay, coir, jute – properties - uses - fire retardant treatment termite proofing. Types of foundations - walls - simple roof trusses floors for rural structures. Assignments				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		30	0	30	60

TEXT

1. S.C.Rangwala – Engineering Materials Charotar Publishing House – Anand 1997
2. W.B.Mckay – Building Construction Vol. 1,2,3- Longmans U.K 1981.

REFERENCES

1. R.J.S.Spencke and D.J.Cook, Building Materials in Developing Countries, John Wiley and Sons, 1983.
2. HUDCO - All you want to know about soil stabilized mud blocks, HUDCO Pub, New Delhi, 1989.
3. UNO - Use of bamboo and reeds in construction - UNO Publications. Rural Construction - NBO, New Delhi

WEBSITES

1. <http://www.bamboo-Flooring.com>
2. <http://ag.avizona.edu/SWES>
3. <http://www.angelfite.com/in>
4. <http://www.idrc.ca/library/documents/104800/chapz-e.html>
5. <http://www.angelfite.com/inz/granite>

XAR206 – CARPENTRY AND MODEL MAKING WORKSHOP 0 – 0 – 6 – 3

Course Objectives:

1. To equip students with the basic skills necessary to represent their ideas through models using different materials. To make students practice with various tools essential for making architectural models.

architectural models.						
SUBCODE	SUB NAME	L	T	P	C	
XAR 206	CARPENTRY AND MODEL MAKING WORKSHOP	0	0	3	3	
C:P:A	0:3:0	L	T	P	H	
		0	0	3	6	
UNIT – I	INTRODUCTION TO MODEL MAKING					15
	Need for architectural models, Role of scale-models in design; General practices in model making; Types of models: block, detailed, construction & interior models. Introduction to concepts of model making and various materials used for model making.					
UNIT – II	BASE AND BLOCK MODELLING					15
	Preparation of base for models using wood or boards, Introduction to block models of objects (3D Compositions) and buildings involving the usage of various materials like Thermocole, Soap/Wax, Boards, Clay, etc.					
UNIT –III	DETAIL MODELLING					20
	Making detailed models which includes the representation of various building elements like Walls, Columns, Steps, Windows/glazing, Sunshades, Handrails using materials like Mountboard, Snow-white board, acrylic sheets; Representing various surface finishes like brick/stone representation, stucco finish etc; Various site elements – Contour representation, Roads/Pavements, Trees/Shrubs, Lawn, Water bodies, Street furniture, Fencing etc,					
UNIT– IV	JOINERY AND STRUCTURAL SYSTEMS MODEL					20
	JOINERY Simple exercises in cutting, finishing and joinery with simple blocks; Use of carpentry tools and making joints such as Dovetail joint, Mortise and Tenon joint, Lap joint, Butt joint, etc. to be used for making furniture. MODELS OF STRUCTURAL SYSTEMS Making models of the various structural systems used in buildings like; Space frames – using Match sticks, wires; Different forms of shell roofs using POP, Clay, Soap; Tensile structures using fabric					
UNIT – V	INNOVATIVE IDEAS, MATERIAL AND TECHNIQUES					20
	Flexible for the teacher to decide assignments for representing innovative ideas, and by using new materials and techniques.					

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	0	0	90	90
TEXT BOOKS				
<ol style="list-style-type: none"> 1. Models.3rd Ed. Hoboken : John Wiley & Sons. 2. Kieran, S. and Timberlake, J. (2008). LobollyHouse : Elements of a New Architecture. New York : Princeton Architectural Press. 3. Morgan, C. L. and Nouvel, J. (2002). The Elements of Architecture. London : Thames &Hudson. 4. Werner, M. (2011). Model Making. New York : Princeton Architectural Press 5. Elements of Workshop Technology, Vol. I", HajraChoudhury, HazraChoudhary and Nirjhar Roy, Media promoters and Publishers Pvt. Ltd., 2007. 6. "Workshop Technology", W. A. J. Chapman,1st South Asian Edition, Viva Book Pvt Ltd., 1998. 7. "Manufacturing Technology, Vol.1, 3rd Ed.", P.N. Rao,Tata McGraw Hill Publishing Company, 2009 8. Mills, Criss B., "Designing with Models",John Wiley & Sons, New Jersey,. 9. Knoll, Wolfgang & Hechinger, Martin, "Architectural Models", J.Ross Publishing,2006. 10. Watson, Don A., "Construction Materials and Processes", McGraw Hill Co., University of Michigan,1972. 11. Mckay, W.B., "Building Construction", Vol.1, 2, 3 Longmans, U.K.1981. 12. Alanwerth, "Materials", The Mitchell Pub.Co.Ltd., London, 1986. 13. Chudley, R., "Building Construction Handbook", British Library Cataloguing in Publication Data, London, 1990. 14. Rangwala, S.C., "Engineering Materials", Charotar Pub. House, Gujarat, 1997. 				

SUBCODE	SUB NAME	L	T	P	C
XAR 207	ARCHITECTURAL DESIGN - I	0	0	6	9
C:P:A	2:1.5:1.5	L	T	P	H
		0	0	6	12
UNIT – I	SUBTRACTIVE UTILITY SCULPTURE	24			

Parameters of design, anthropometrics. Understating the relationship between the human activity, Interrelationship of architectural space to form, structure, and materials.

Design of Subtractive utility sculpture -A Play object for 4-6 years age children.

Areas of concern/ focus:

- Scale and proportion
- Activity analysis
- Appropriate materials and construction

Methodology:

Data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for the users

Presentation:

Concepts and presentation of design with scaled models and rendered drawings.

UNIT – II	ADDITIVE UTILITY SCULPTURE	24
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Design of Additive utility sculpture – Utility object

Areas of concern/ focus:

- Scale and proportion
- Activity analysis
- Appropriate materials and construction

Methodology:

Data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for the users

Presentation:

Concepts and presentation of design with scaled models and rendered drawings.

UNIT –III	STUDY	36
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Study of Anthropometry details with free hand sketches and the study of the relationship between form and function in a man-made objects.

Areas of concern/ focus:

- scale and proportion
- Behavioral aspects
- Anthropometry details
- Application of Forms in construction

Methodology:

Study of Anthropometric details and applications of forms in buildings.

Presentation:

Study work has to be done in outside the classroom.

UNIT – V	DESIGN OF SPACE	36
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Parameters of design, anthropometrics. Understating the relationship between the human activity and spatial, furniture requirements, Interrelationship of architectural space to form, structure, and materials.

Redesign of single space such as own room etc.

Areas of concern/ focus:

- Scale and proportion
- Activity analysis
- Appropriate materials and construction

Methodology:

Data collection, Measure drawing of own room/case studies, analysis and presentation of studies – Data collection with respect to design and detailing for the users

Presentation:

Concepts and presentation of design with scaled models and rendered drawings.

UNIT –V	MULTIFUNCTIONAL SPACE	60
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The design problem shall take into consideration of activities and their relationship with space, function, scale and proportion, climate.

The project shall be Shop, Workshop, pavilions, snack bar, cafeteria

Areas of concern/ focus:

- scale and proportion
- Behavioral aspects
- Site planning
- Appropriate materials and construction

Methodology:

Data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for the users

Presentation:

Concepts and presentation of design with scaled models and rendered drawings.

	LECTURE 0	TUTORIAL 0	PRACTICAL 180	TOTAL 180
TEXT				
1. De Chiara and Callender, Time Saver Standard for Building Types, McGraw-Hill Co., 2nd Edition, 1980. 2. Edward D.Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in Publication Data, 1985. 3. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw-Hill Book Co., 1982. 4. Neufert Architect's Data, Rudolf Herg, Crosby Lockwood and Sons Ltd., 1970.				
REFERENCES				
1. Edward D.Mills - Planning the Architects Hand Book - Bitterworth, London, 1985. 2. Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canaa), 1979.				

SUBCODE	SUB NAME	L	T	P	C
XAR 301	HISTORY OF ARCHITECTURE - III	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I	PREHISTORIC & EGYPTIAN ARCHITECTURE				5
	Development of Shelter during prehistoric age. Factors influencing Architecture - Outline of Architectural Character of Egyptian architecture. Factors influencing Architecture				
UNIT-II	WEST ASIA				10
	Evolution of Sumerian, Babylonian and Persian cultures - Factors influencing architecture - Outline of architectural character - Palace of Sargon, Khorsabad - Palace at Persepolis.				
UNIT-III	GREECE				10
	Evolution architecture in the archaic and classic periods – Factors influencing architecture - Outline of architectural character – optical illusion in buildings, Orders in architecture - Doric Ionic and Corinthian, Parthenon, Athens;				
UNIT-IV	ROME				10
	Factors influencing architecture - outline of architectural character; Colloseum Rome; Pantheon, Rome				
UNIT-V	EARLY CHRISTIAN AND BYZANTINE				10
	Birth and spread of Christianity - Evolution of church forms - Factors influencing architecture - Outline of Architectural character - St.Sophia, Constantinople.				

	LECTURE 45	TUTORIAL 0	PRACTICAL 0	TOTAL 45
TEXT				
1. Sir Banister Fletcher – A History of Architecture University of London, The Athlone Press 1986..				
REFERENCES				
1. Pier Liugi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams, Inc.Pub., New York, 1972. 2. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986. 3. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985. Gosta, E.Samdstrp, Man the Builder, McGraw-Hill Book Company, New York, 1970.				

SUBCODE	SUB NAME	L	T	P	C
XAR 302	SITE SURVEYING AND PLANNING	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3

UNIT – I	INTRODUCTION TO SURVEY AND ITS TECHNIQUES	9
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Definition of plot, site, land and region, units of measurements, reconnaissance, and need for surveying. Chain survey and compass survey - Plane Table and Theodolite, total station surveys - various equipments used – simple field surveys.

UNIT-II	SITE ANALYSIS	10
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Importance of site analysis - factors involved – On site and off site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects

UNIT-III	SITE ANALYSIS TECHNIQUES	10
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Preparation of site analysis diagram. Study of microclimate:- vegetation, landforms and water as modifiers of microclimate. Study of land form;- contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations – Architectural and visual aspects.

UNIT-IV	SITE PLANNING AND LAYOUT PRINCIPLES	10
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Context of the site. Preparation of site plan drawing – incorporation of site analysis factors, Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections

UNIT-V	ENVIRONMENTAL FACTORS	6
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Man-made structures, sensuous qualities, cultural data, images and data correlation - vegetation – plant associations, types and distribution - preparation of ecological profile for an area, **basic understanding of agencies related to environmental regulations.**

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	0	0	45

TEXT

1. W.M. Marsh - Landscape Planning, John Wiley & Sons, USA 1983.
2. B.C.Punmia - Surveying Vol.I - Standard Book House, New Delhi - 1983.

REFERENCES

1. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
2. Edward. T. Q., “Site Analysis”, Architectural Media, 1983.
3. P.B.Shahani - Text of surveying Vol. I, Oxford and IBH Publishing Co - 1980
4. Joseph De.Chiarra and Lee Copleman - Planning Design Criteria - Van Nostrand Reinhold Co.,New York - 1968.
5. Beer R, Environmental Planning for Site development, Turner, Landscape Planning and environmental impact design.

SUBCODE	SUB NAME	L	T	P	C
XAR 303	MECHANICS OF STRCUTURES - II	3	0	0	3
C:P:A	2:0.5:0.5	L	T	P	H
		3	0	0	3
UNIT – I	SHEAR FORCE AND BENDING MOMENT	9			
	Concept of shearing forces and Bending Moments - shear force and bending Moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations.				
UNIT – I I	STRESSES IN BEAMS	9			
	Theory of simple bending -bending stresses in beams, shear stresses in beams - examples on simple sections. Stress distribution diagrams.				
UNIT – III	DEFLECTION OF BEAMS	9			
	Slope and deflection at a section - Double Integration and Macaulay's method for simply supported and cantilever beams for concentrated loads and uniformly distributed loads.				
UNIT – IV	THEORY OF COLUMNS	9			
	Short and long columns - Euler's method and its limitations - Derivations of Euler's formula (for different end conditions) – Rankine’s formula for columns (No derivations) – Application to simple problems.				
UNIT – V	INTRODUCTION TO INDETERMINATE STRUCTURES	9			
	Concept in Analysis of continuous beams, fixed beams, and partial frames - Application to simple problems.				
	LECTURE	TUTORIA	PRACTICA	TOTAL	
		L	L		
	45	0	0	45	

TEXT

1. M.M.Ratwani&V.N.Vazirani, Analysis of Structure, Vol.1, Khanna Publishers – Delhi, 1987
2. A.R.Jain and B.K.Jain, Theory and analysis of Structures, Vol. 1, Nemchand and Bros, Roorkee, 1987.

REFERENCES

1. Dr.V.S.Prasad, Basic Structural Mechanics, Galgotia Publications.
2. Timoshenko, S.P., and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.
3. B.C.Punmia, “Strength of Materials and Theory of Structures”, Vol. 1, Laxmi publications, New Delhi 1994.
4. R.K. Rajput “Strength of Materials”, S.Chand& Company Ltd., New Delhi 1996

SUBCODE	SUB NAME	L	T	P	C
XAR 304	BUILDING SERVICES - I	2	0	1	3
C:P:A	1:1:1	L	T	P	H
		2	0	1	4
UNIT – I	WATER QUALITY, PURIFICATION AND TREATMENT	10			
	Sources of water -Surface and ground water sources. Water quality - nature of impurities, Water treatment methods – Aeration, sedimentation, filtration sterilization, disinfection and softening. Water requirements for all type of residential, commercial, industrial buildings and for town.				
UNIT–II	WATER DISTRIBUTION AND STORAGE	16			
	Distribution systems in small towns - Types of pipes used - Laying, jointing, testing - prevention of water wastage and reuse of water. Plumbing-Internal water supply layout in buildings, pipe size calculations, Planning and layout of water supply distribution in residences. Types of water supply pumps and their applications - mechanical equipment. Automation systems. Water heating systems, solar water heaters. Energy efficient systems. Water requirements calculation and Water storage systems- Design and calculations of OHTs, UG Sumps and fire fighting storage. Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.				
UNIT–III	STORM WATER DRAINAGE AND RAIN WATER HARVESTING	10			
	Basic principles of storm water drainage, Types of Drain pipes and pipe size calculations, storm water gutter. Rainwater harvesting principles, rain water pipe calculation. Details of rain water disposal - roof drain, systems of sub soil drainage. Different types of pavements and details for water percolation.				
UNIT–IV	SEWERAGE AND SANITATION	14			
	Sewerage, Sewer and sewage. Sewage - Their disposal, Primary treatment, Secondary treatment. Biological treatment. Modern types of sewage treatment plants. Sewer -Types of sewer systems, Construction details of Sewer line, gradients, manholes, inspection chambers, septic tank, leach pits, traps for various types and its details. Drainage and sanitation requirements for various private and public buildings. Drainage and sanitary appliance materials, fittings, pipes, sizes for toilet and kitchen fittings. Connection of lines to fittings. Choice of plumbing systems. Planning and layout of sanitary fittings in residences. Understanding of service drawings. Site visits with documentation in the form of sketches/ drawings/ photos.				
UNIT–V	SOLID WASTE MANAGEMENT	10			
	Solid waste management concepts and systems, waste and resources, recycling solid waste in small and large buildings - Refuse collection, disposal, Incinerator, Composting, Vermicomposting, Sanitary Land filling, Biogas system and Modern renewable energy system., equipments for handling solid waste. Refuse chute, service core concepts.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	30	0	30	60	

TEXT

1. S.C.Rangwala, Water Supply and Sanitary Engineering, Charotar Publishing House, 1989
2. National Building Code 2016.
3. Indian Standard Code of Practice for Water Supply in Buildings, IS :2065 – 1983'.
4. Mechanical and Electrical Equipment for buildings, Benjamin Stein, John.S.Reynolds, Walter.T.Grondzik, Alison.G.Kwok, 10th edition, John Wiley and Sons, London, 2006.
5. Punmia B.C., 'Waste Water Engineering', Laxmi Publications, 2009.

REFERENCES

1. Manual on Sewerage and Sewage Treatment, CPHEEO, Ministry of Works and Housing, New Delhi, 1980.
2. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968.

SUBCODE	SUB NAME	L	T	P	C
XAR 305	MATERIALS AND CONSTRUCTION - II	2	0	2	4
C:P:A	0.6:2:1.4	L	T	P	H
		2	0	2	5
UNIT – I	BRICKS AND CLAY PRODUCTS				20
	Drawings of brick foundations - buildings in brickwork, bonds columns, corners – structural members in brickwork. Reinforced brick masonry - Arches - Lintels – Corbels - copings. Hollow clay blocks - for walls - partitions - roofs. Roofings - Flat Roofs or Terrace roofs - Sloping roofs. Plates & assignments				
UNIT – II	TIMBER AND ALLIED PRODUCTS				15
	Softwood and hardwood - Physical properties and uses - Defects, Conversion, Seasoning, decay and preservation of timber - Fire retardant treatment, anti-termite treatment. Industrial timbers - plywood, block board, particle board, fibre boards. Manufacture and uses - current developments. Assignments				
UNIT– III	TIMBER JOINERY				30
	Introduction to timber joinery, Details of timber joinery for Windows, doors, ventilators. Timber partitions, paneling - false ceiling, fixed partitions, movable partitions. Timber staircases - Designed staircase - timber trusses - Lean-to – close couple - Kingpost - Queen post - Trusses. Timber floors - timber built-in-furniture. Plates through case studies				
UNIT – IV	COST EFFECTIVE BUILDING TECHNOLOGY				10
	Drawings of foundations – walling – Roofs – partitions – ceiling panel – doors and windows. Miscellaneous – Drawing of Brick jallies, Screen walls – pavement blocks – Ferrocement water tanks. Assignments				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		30	0	45	75

TEXT

1. S.C.Rangwala, Engineering Materials, Charotar Pub. House, Anand, 1997.
2. W.B.Mckay, 'Building Construction', Vol.1, 2, 3 Longmans, U.K. 1981.

REFERENCES

1. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
2. Alanwerth, Materials, The Mitchell Pub. Co. Ltd., London, 1986.
3. R.Chudleu, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.

WEBSITES

1. <http://www.ibex-ibex-intl.com>
2. <http://www.inika.com/chitra>
3. <http://www.routbdge.com>
4. <http://www.venturaindia.com>

SUBCODE	SUB NAME	L	T	P	C
XAR 306	COMPUTER APPLICATIONS IN ARCHITECTURE - I	0	0	2	3
C:P:A	0.5:2.0:0.5	L	T	P	H
		0	0	2	4
UNIT – I	INTRODUCTION TO BASICS OF COMPUTER				4
	Introduction to personal computers – hardware / software – operating system – important DOS commands – Windows. Introduction to MS Word, Excel.				
UNIT – II	BASIC OF AUTOCAD				8
	Basic introduction to CAD packages. Setting up & controlling the AutoCAD drawing environment – Creating & Editing Commands.				
UNIT– III	AUTOCAD 2D DRAWINGS				20
	Organizing a drawing with layers – Advanced geometry editing – Creating & using Blocks, Dynamic blocks. X –Referencing files. Inquiry tools. Text annotation. Creating & Customizing Hatch patterns. Productive Dimensioning – Defining Text & Dimension Styles. Printing & plotting				
UNIT – IV	AUTOCAD 3D MODELS				16
	Drawing utilities – importing / exporting files. Understanding 3D coordinate system - Using View ports – 3D drawing & Editing commands				
UNIT – V	RENDERING AND PRESENTATION				12
	Introduction to rendering in 3D – Rendering process – Enhancing digital images from CAD application using Adobe Photoshop, & other graphic programs. Use of Sketch Up for modeling of buildings and presentation of design projects as Photo realistic images and virtual architecture.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		0	0	60	60
TEXT					
	1. Omura George, "Mastering AutoCAD (Release 19)", BPB Publications, New Delhi, 2018.				
	2. Omura George, " AutoCAD 2000", BPB Publications, New Delhi, 1997				
	3. George Omura, Brian C. Benton, AutoCAD 2019 and AutoCAD LT 2019, Autodesk Official Press (SYBEX)				

SUBCODE	SUB NAME	L	T	P	C
XAR 307	ARCHITECTURAL DESIGN - II	0	0	6	9
C:P:A	2.0:5.0:2.0	L	T	P	H
		0	0	6	12
UNIT – I	CONTENT				180
	Projects involving single level planning in small scale, small span, horizontal movement and simple vertical movement. Areas of concern/ focus: <ul style="list-style-type: none"> • Form-space relationships • Spatial organization • Behavioral aspects especially those relating to children • Site planning aspects • Appropriate materials and construction 				
	Suggestive Typologies/ projects: Residential buildings, institutional buildings: nursery or primary schools, schools for children with specific disabilities, primary health center, banks, neighbourhood market, neighbourhood library, Gate complexes including security Kiosk and entry/ exit gates.				

	Methodology: Data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for physically handicapped persons – Presentation: Concepts and presentation of design with scaled models and rendered drawings.			
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	0	0	180	180
TEXT				
1. Joseph De Chiara, Michael J Crosbie, “Time Saver Standards for Building Types”, McGraw Hill Professional, 2001. 2. Julius Panero, Martin Zelnik, “Human Dimension and Interior Space”, Whitney Library of Design, 1975 3. Joseph De Chiara, Julius Panero, Martin Zelnik, “Time Saver Standards for Interior Design and Space Planning”, McGraw Hill, 2001. 4. Ernst Neuferts, “Architects Data,” Blackwell, 2002. 5. Ramsey et al, “Architectural Graphic Standards”, Wiley, 2000.				
REFERENCES				
1. Richard P. Dober, “Campus Planning” - Society for College and University Planning, 1996. 2. Achyut Kanvinde, “Campus design in India”, American year Book, 1969 3. Kevin Lynch, “Site planning”, MIT Press, Cambridge, 1967 4. Sam F. Miller, “Design Process: A Primer for Architectural and Interior Design”, Van Nostrand Reinhold, 1995.				

SUBCODE	SUB NAME	L	T	P	C
XAR 401	HISTORY OF ARCHITECTURE - I	3	0	0	3
C:P:A	3:0:0	L 3	T 0	P 0	H 3
UNIT – I	ANCIENT INDIA	7			
	Indus Valley Civilization - Culture and pattern of settlement. Aryan civilization - Evolution of early Aryan architectural forms - origins of early Hinduism - Vedic culture Vedic village and the rudimentary forms of bamboo and Wooden construction under the Mauryan rule - origins of Buddhism and Jainism.				
UNIT-II	BUDDIST ARCHITECTURE	10			
	Hinayana and Mahayana Buddhism - Architectural Production during Ashoka's rule - Ashokan Pillar. Salient features of a Chaitya hall and Vihara- Karli , Rani Gumpha				
UNIT-III	HINDU ARCHITECTURE	8			
	Evolution of Hindu temple - Early shrines of the Gupta and Chalukyan periods – Tigawa temple, Ladh Khan Aihole, Papanatha and Virupaksha temples, Pattadakal. A comparative study of the Buddhist and Hindu styles				
UNIT-IV	DRAVIDIAN ARCHITECTURE	10			
	Rock cut productions under Pallavas –Shore temple, Mahaballipuram - Kailasanathar temple & Vaikunthaperumal temple, Kanchipuram, Dravidian Order – Evolution of Gopuram, city planning, Brihadeeswara Temple, Tanjore - Meenakshi temple, Madurai - Srirangam temple.				
UNIT-V	INDO ARYAN STYLE	10			
	Salient features of an Indo Aryan temple - Lingaraja Temple- Bhuvaneswar , Sun temple-Konarak. Kunds and Vavs – vav - Adalaj - Surya kund, Modhera – Khandharia Mahadev temple, Khajuraho - Dhilwara temple, Mt. Abu. A comparative study of the Dravidian and Indo-Aryan styles.				

REFERENCES

1. Galloe, Salam and Sayigh A.M.M., "Architecture, Comfort and Energy", Elsevier Science Ltd., Oxford, U.K., 1998.
2. M.Evans- Housing, Climate and Comfort - Architectural Press, London, 1980.
3. B.Givoni, Man, Climate and Architecture, Applied Science, Banking, Essex, 198.
4. Donald Watson and Kenneth Labs., Climatic Design - McGraw Hill Book Company- New York - 1983.
5. B. Givoni, "Passive and Low Energy Cooling of building", Van Nortrand Reinhold New York, USA, 1994.

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1. <http://www.envinst.conu.edu/~envinst/research/built.html>
2. www.terin.org/
3. <http://www.pge.com/pec/archives/w98passi.html>
4. <http://solstice.crest.org/efficiency/index.shtml>

SUBCODE	SUB NAME	L	T	P	C
XAR 403	DESIGN OF STRUCTURES – I	3	0	0	3
C:P:A	0.6:1.2:1.2	L	T	P	H
		3	0	0	3
UNIT – I	ADVANCED CONCRETE STRUCTURES				9
	Principles of Pre stressing – Methods of Pre stressing – Materials used – Analysis and Losses of pre stressing, simple problems. Principles of Post tensioning – Methods of Post tensioning – Materials used – Analysis and Losses of Post tensioning, simple problems. Prefabrication of structures – dimension analysis.				
UNIT – II	STEEL SECTIONS AND RIVETED, WELDED & BOLTED JOINTS				9
	Properties of rolled steel sections, riveted joints, Analysis and Design of riveted joints (Excluding eccentric Connections) Types of welding, permissible stresses, Design of fillet welds (excluding eccentric connections) Design of Bolted connection.				
UNIT –III	TENSION MEMBERS				9
	Introduction – Net sectional area – permissible stresses. Design of Axially loaded Tension member – Lug angle – code provision – tension splice.				
UNIT –IV	COMPRESSION MEMBERS				9
	Introduction – various sections – built up section – Design of columns (excluding Lacing, Battening and other connections.)				
UNIT –V	DESIGN OF CIRCULAR SLAB AND CONCRETE WALLS				9
	Design of concrete walls – Design of cantilever – Cantilever retaining walls – Shear wall. Classification of walls. Design of Simply supported and fixed Circular slabs subjected to uniformly distributed loads				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	

TEXT

1. Ramachandra S., Design of Steel Structures, Standard Book House, Delhi, 1984.
2. "N. Krishna Raju". Design of Prestressed Concrete Structures Tata McGraw-Hill Education 1986
3. P.Dayarathnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983

REFERENCES

1. National Building Code of India, 1983, Part VI, Structural Design.
2. Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
3. Negi "Design of steel Structures", Tata McGraw-Hill Book Company, New Delhi 1997.
4. S.S.Bhavikatti "Design of steel Structures", I. K. International Pvt Ltd, 2009

SUBCODE	SUB NAME	L	T	P	C
XAR 404	BUILDING SERVICES – I I	2	0	1	3
C:P:A	2.1:0.6:0.3	L	T	P	H
		2	0	1	4
UNIT – I	ELECTRICAL SYSTEMS	10			
	Basics of Electricity, Units of Electricity, Distribution, AC,DC, Single phase, three phase supply, protective devices, earthing, electrical installations, Switches, Loading calculations, Symbols and notations in drawings, power requirement for various appliances, location of installations, Typical electrical layout for residences.				
UNIT – II	LIGHTING AND ILLUMINATION	9			
	Lighting basics, Elements of lighting, units of lighting-luminous flux, luminous intensity, illuminance and luminance, colour temperature, beam angle and field angle, Lighting level for different uses in outdoor and indoor environment. Daylighting – Daylight Considerations for designing with daylight - typology, room dimensions, openings. Daylight Factor.Artificial Lighting -concepts –lighting layers, techniques, Lighting sources-lamps and luminaries, control devices, Case study : Office lighting design.				
UNIT –III	ENERGY EFFICIENT LIGHTING	14			
	Energy efficient technologies and design approaches –selection of luminaries, lighting controls and daylighting, glare from lamps, Reducing electric loads, installation and maintenance – LEED certification & energy efficient lighting, energy audit for lighting performance. Solar energy systems for lighting – Photovoltaic systems for Residential/Commercial buildings. Case studies and exercises involving in the above.				
UNIT –IV	FUNDAMENTALS OF ACOUSTICS	9			
	Fundamentals – sound waves, wave length ,frequency, intensity, Octave, , measure of sound, decibel scale, speech and music frequencies, NC curves. Indoor Accoustics -Material property - absorption, reflection, scattering, diffusion, transmission. Absorption co-efficient, NRC. Sound Transmission – Air borne, Structure borne, Sound Transmission Class (STC), Impact Insulation Class (IIC). Understanding acoustic properties of materials, types of acoustic absorbers.				
UNIT –V	INDOOR AND ENVIRONMENTAL ACOUSTICS	12			
	Acoustical criteria for various spaces – conference rooms, lecture halls, recording studios, Open air theatres and auditoriums. Importance of shape volume, treatment for interior surfaces, etc. Indoor Acoustics - Reverberation time, optimum reverberation time, echo, early decay time. Environmental Acoustics –Types of noise and its control at site level -and urban level-geometrical changes, noise barriers. Structure borne and air borne noise control. Site selection. Simple problems based on reverberation time and absorption coefficients. Acoustic design for simple and small projects including planning.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		30	0	30	60
TEXT					

1. M.K.Halpeth, T.Senthil kumar, G.Harikumar "Light Right", TERI publications,2004
2. Jason Livingston, "Designing with light",Wiley,2014
3. Philips, "Lighting in Architectural Design", McGraw Hill. New York, 1964

REFERENCES

1. Handbook of building Engineers in metric systems, NBO(India), 1968
2. National Building Code of India, 2016 (NBC 2016)
3. Mechanical and Electrical Equipment for buildings, Benjamin Stein, John.S.Reynolds, Walter.T.Gronzik, Alison.G.Kwok, 10th edition, John Wiley and Sons, London, 2006.
4. 'The Lighting Handbook', IES, 2011.
5. R. G. Hopkenson & J. D. Kay, "The lighting of Buildings", Faber & Faber, London, 1969.

SUBCODE	SUB NAME	L	T	P	C
XAR 405	MATERIALS AND CONSTRUCTION – III	2	0	2	4
C:P:A	1.2:1.2:0.6	L	T	P	H
		2	0	2	5
UNIT – I	FERROUS METALS				6
	Introduction to Ferrous metals, Types of Ferrous metals, its properties and applications, Manufacturing process by blast furnace, oxygen furnace and production of structural shapes, cast steel, hot rolled, cold rolled steel, Heat treatment of steel, Coated steel.				
UNIT – II	STEEL CONSTRUCTION				3
	Joining of Steel members, Details of steel framing, Stabilization of steel frames structures, Metal Doors and windows assembly, Steel staircases, Lattice Truss, Beam, Portal Frame and Flat roof Structures, Fire proofing of steel framings. Design and construction parameters developed by INS DAG. Typical Plates: Metal windows, Metal doors, Steel Staircase, Lattice steel roof truss, Tubular Steel roof truss, Steel space frame for flat roof.				
UNIT –III	NON FERROUS METALS				5
	Introduction to Aluminum, Physical properties, Manufacture of extruded sections and flat products, Finishes for Aluminum, Fabrication process and connections, Introduction to Copper, Manufacture, Grades and Sizes of Copper, Patina and corrosion, protective coatings, Copper alloys: Bronze, Brass. Titanium – Manufacture, Properties and uses, Titanium alloys.				
UNIT –IV	CONSTRUCTION USING NON-FERROUS METALS				28
	Aluminum doors and windows, Ironmongery, Aluminum glass framing systems, Curtain walls and structural glazing, Exterior wall claddings, Skylights, Interior dry wall partition, False ceiling. Application of gaskets, caulking and sealants. Typical Plates: Aluminium windows, doors, shop front curtain walls, structural glazing systems and aluminium composite panel cladding				
UNIT –V	GLASS				6
	Introduction to glass, Composition and forming process, Extruded section and cast glass blocks, Types of glass, Strength of glass, Fire resistant glass, Insulation glass, Energy conservation and solar control glass, Acoustic properties of glass. Typical Plates: Showroom glass wall systems, Glass staircase, Balustrade and glass partition systems, installation details of glass.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	15	0	60	75	

TEXT

1. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
2. W.B.Mckay Building Construction, Longmans, U.K. 1981.
3. Fundamentals of Building Construction, John Wiley & Sons Inc, 2009.
4. Materials for Architects and Builders, Elsevier, 2010

REFERENCES

1. B.C.Punmia, Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 1993.
2. Arthur Lyons - Materials for Architects and Builders - An Introduction - Arnold, London, 1997.
3. Harold B.Olin, Construction Principles Materials and Methods, The Institute of Financial Education, Chicago, 1980.
4. Time Saver Standards for Architectural Design Data, Calendar JH, McGraw-Hill, 1974.
5. Don A. Watson, Construction Materials and processes, McGraw Hill Co., 1972.

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1. <http://www.britmetfed.org.uk/frmedu.html>
2. <http://www.indiabussinesonline.com>
3. <http://www.nrwas.com>
4. <http://www.arcadiaproducts.com>
5. <http://www.sail.com.in>

XAR406 – OPEN ELECTIVE

0 – 0 – 2 – 2

To be attended in other department.

SUBCODE	SUB NAME	L	T	P	C
XAR 407	ARCHITECTURAL DESIGN – III	0	0	6	9
C:P:A	2:4:3	L	T	P	H
		0	0	6	12
UNIT – I	DESIGN STUDIO				70
	Problem related to multi room, single use, small span - multiple story, Horizontal and vertical movement, Active cum passive energy, conventional and frame type buildings. Examples: Department store, Library, higher secondary school, campus students' centre, etc. The projects will consciously provide for movement and use by the physically handicapped and elderly.				
UNIT – II	DESIGN STUDIO - RURAL PROJECT				11
	Problems related to Rural Housing - Visits to selected village - surveys on socio-economic, physical, housing and surveys, etc. to study existing conditions - analysis of survey data - preparation of report and presentation in a seminar – identifying the need and demand of the society - preparation of design solutions for housing and community facilities.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		0	0	180	180

TEXT

1. Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. - 2002

REFERENCES

1. De Chiara and Callender, Time Saver Standard for Building Types, McGraw-Hill Co., 2nd Edition, 1980.
2. P&D Act 1995.
3. Edward D.Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in Publication Data, 1985.
4. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw-Hill Book Co., 1982.
6. Neufert Architect's Data, Rudolf Herg, Crosby Lockwood and Sons Ltd., 1970.

XAR501 - CONTEMPORARY ARCHITECTURE**3 – 0 – 0 – 3**

SUBCODE	SUB NAME	L	T	P	C
XAR501	CONTEMPORARY ARCHITECTURE -I	3	0	0	3
C:P:A	1.5:0:1.5	L	T	P	H
		3	0	0	3
UNIT I CRITIQUING MODERNISM					6
Writings of Venturi - Jane Jacobs -- Christopher Alexander.					
UNIT II AFTER MODERNISM					12
Post-Modernist Architecture - Historic Revivalism – Critical Regionalism - Deconstructive Theory and Practice.works of zahaHadid, Peter Eissenmen, Daniel Libiskind, Coop Himmelblau.					
UNIT III ALTERNATIVE PRACTICES					12
Ideas and selected Works of - Fathy - Baker - Ando - Soleri - Bawa.					
UNIT IV ARCHITECTURE IN COLONIAL INDIA					6
Colonialism and its impact - Early British Neo-classical Architecture - Indo-Sarcenic rchitecture and the Works of Chisholm - P.W.D. and the Institutionalization of Architecture – architecture and planning of New Delhi					
UNIT V. POST-INDEPENDENT ARCHITECTURE IN INDIA					9
Influence of Corbusier and Louis khan on Indian architects, Housing and the issues of Appropriate Technology-Architecture in the Horizon. Adaptations of modern architecture in Indian context, Chandigarh, le corb, and khan, works in India Works and ideas: Nari Gandhi - Doshi - Kanvinde–Correa					
	LECTURE	TUTORIA L	PRACTICAL	TOTAL	
	45	0	0	45	
TEXT					
1. Bill Risebero, Modern Architecture and Design.					
2. Kenneth Frampton, Modern Architecture: A Critical History, Tahmes and Hudson, London, 1994.					
3. Leonardo Benevolo, “History of Modern Architecture”, 2 Vols., reprint, MIT Press, 1977.					
REFERENCES					
1. Thomas Metcalf, An Imperial Vision, Faber and Faber, London, 1989.					
2. ManfredoTaferi / Franceso dal co., Modern Architecture, Faber and Faber/Electa,1980.					
3. Sigfried Giedion, Space Time and Architecture: The Growth of a New Tradition, Havard University Press, 1978.					

SUBCODE	SUB NAME	L	T	P	C			
XAR 502	ENVIRONMENTAL SCIENCES	3	0	0	3			
C:P:A	3:0:0	L 3	T 0	P 0	H 3			
UNIT – I	INTRODUCTION TO ENVIRONMENTAL STUDIES AND ENERGY	12						
Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over utilization of surface and ground water, flood, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.								
UNIT – II	ECOSYSTEMS AND BIODIVERSITY	7						
Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.								
UNIT – III	ENVIRONMENTAL POLLUTION	10						
Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: flood, earthquake, cyclone and landslide.								
UNIT – IV	SOCIAL ISSUES AND THE ENVIRONMENT	10						
Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation – Consumerism and waste products – Environment Protection Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.								
UNIT– V	HUMAN POPULATION AND THE ENVIRONMENT	6						
Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education - HIV / AIDS – Women and Child welfare programme– Role of Information Technology in Environment and human health – Case studies.								
LECTURE		45	TUTORIAL	0	PRACTICAL	0	TOTAL	45

TEXT

1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
2. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, U 2003
3. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, Ind 2003.
4. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
5. Introduction to International disaster management, Butterworth Heinemann, 2006.
6. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, New Delhi, 2004.

REFERENCES

1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
2. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
3. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
4. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
5. Sundar, Disaster Management, Sarup& Sons, New Delhi, 2007.
7. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

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1. <http://www.e-booksdirectory.com/details.php?ebook=10526>
2. <https://www.free-ebooks.net/ebook/Introduction-to-Environmental-Science>
3. <https://www.free-ebooks.net/ebook/What-is-Biodiversity>
4. https://www.learner.org/courses/envsci/unit/unit_vis.php?unit=4
5. <http://bookboon.com/en/pollution-prevention-and-control-ebook>
6. <http://www.e-booksdirectory.com/details.php?ebook=8557>
7. <http://www.e-booksdirectory.com/details.php?ebook=6804>
8. <http://bookboon.com/en/atmospheric-pollution-ebook>
9. <http://www.e-booksdirectory.com/details.php?ebook=3749>
10. <http://www.e-booksdirectory.com/details.php?ebook=2604>
11. <http://www.e-booksdirectory.com/details.php?ebook=2116>
12. <http://www.e-booksdirectory.com/details.php?ebook=1026>
13. <http://www.faadooengineers.com/threads/7894-Environmental-Science>

UNIT – I PROPERTIES OF CONCRETE & WORKING STRESS METHOD OF DESIGN	9
Structural properties of concrete – Grades and Strength of concrete – Durability – Reinforcing steel – Code Provisions of concrete and steel – Introduction to working stress method – Design of rectangular beams for bending and shear.	
UNIT – II LIMIT STATE DESIGN – INTRODUCTION & DESIGN OF SLAB	9
Introduction to the Limit state method – partial safety factor - Limit state design of slab – Design of one way slab – Two way slab using IS Code for various edge conditions - Design of Flat slabs	
UNIT – III LIMIT STATE DESIGN OF BEAM	9
Limit state design of beam - Design of rectangular and Flanged beams for bending and shear	
UNIT – IV DESIGN OF COLUMN AND STAIRCASE	9
Limit state design of column - Design of axially loaded short and long columns – Eccentric loaded column - Staircase and its types - Design of dog legged staircase.	

UNIT – V DESIGN OF FOUNDATIONS				9
Foundation and its types – Design of Isolated Footing – Combined rectangular footing				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
HOURS	45	0	0	45
TEXT				
1. Dayarathnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983.				
2. N.C.Sinha and S.K.Roy, Fundamentals of Reinforced Concrete, S.Chand & co., New Delhi, 1983.				
REFERENCES				
1. S.N. Sinha, Reinforced Concrete Design Tata McGraw-Hill, New Delhi 1998.				
2. Dr. B.C. Punmiya, Reinforced Concrete Structures, standard Laxmi publication, Delhi, 1994				
3. P.C.Varghese, Limit State Design of Reinforced Concrete, Printice Hall of India-1999				

SUBCODE	SUB NAME	L	T	P	C
XAR 504	BUILDING SERVICES – III	2	0	1	3
C:P:A	2.4:0.6:0	L	T	P	H
		2	0	1	4
UNIT – I	REFRIGERATION PRINCIPLES AND COMPONENTS	10			
	Thermodynamics. Transfer of heat. Refrigeration cycle components. Vapor compression cycle. Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, fan coil unit, chillers, chiller pumps, cooling towers.				
UNIT – II	HVAC SYSTEMS	14			
	Local and Central Air conditioning systems and their applications- window type, split system, package unit, direct expansion system, VRF, chilled water system, district cooling systems. Energy efficient systems, environmental aspects and latest innovations.				
	Understanding of HVAC Ducting and piping layout drawings.				
UNIT –III	VERTICAL CIRCULATION SYSTEMS	14			
	Elevators and escalators – types, applications and components. Conveyors, travelators, dumb waiters. Standards for all. Latest technologies in vertical transport systems. Integration of lifts and escalators with building automation systems. Understanding all the above through product catalogues/ field visits.				
	Design exercise on the above through choice, calculations, layout and drawings.				
UNIT –IV	FIRE SAFETY - GENERAL PROVISIONS	12			
	Fire, causes of fire and spread of fire. Fire protection, standards - safety regulations - NBC - Planning considerations in buildings like Non-combustible materials, staircases and lift lobbies, general guidelines for egress design, Fire drills , refuge areas.				
UNIT –V	FIRE DETECTION AND FIRE FIGHTING	10			
	Detectors and Alarms - Types of detectors and usage Heat detectors, smoke detectors, photoelectric detectors, Control panel, buzzer etc.,				
	Extinguishing Systems - Fire fighting: various types of Extinguishers, Pumps, Fire tank (static capacity) Dry and wet risers, Automatic sprinklers. Preparation of Means of Egress layouts.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	30	0	30	60	

TEXT

1. National Building Code of India, 2016 (NBC 2016)
2. 'ISHRAE Handbook for Refrigeration', 2015.
3. William H. Severns and Julian R Fellows, 'Air conditioning and Refrigeration', John Wiley and Sons, London, 1988.
4. George R. Strakosch (Editor), Robert S. Caporale, 'The Vertical Transportation Handbook' 4th Edition, Wiley and Sons, 2010.

REFERENCES

1. Mechanical and Electrical Equipment for buildings, Benjamin Stein, John.S.Reynolds, Walter.T.Gronzik, Alison.G.Kwok, 10th edition, John Wiley and Sons, London, 2006.
2. Andrew H Buchanan; 'Structural Design for Fire Safety', Wiley, 2001.
3. Swenson S. Don, 'Heating, Ventilating and Air Conditioning', American Technical Publishers, 1995.
4. CIBSE Guide D, 'Transportation Systems in Buildings', 2010.
5. A.K.Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation
6. Manual', CBS, 2009.

SUBCODE	SUB NAME	L	T	P	C
XAR 505	MATERIALS AND CONSTRUCTION - IV	2	0	2	4
C:P:A	1.5:1.5:1.0	L 2	T 0	P 2	H 5
UNIT – I	CEMENT & CONCRETE - INGREDIENTS AND PROPERTIES	12			
	Varieties of cement, composition, properties and uses - tests for cement - mortar for various works. Ingredients - suitability requirements for aggregates, grading of aggregates – water mix in concrete - reinforcement - admixtures - properties of concrete. Concreting process - mix proportioning - batching, mixing, transporting, placing, compaction, curing, formwork - quality control - tests for concrete - joints in concrete - concrete finishes. Types of concrete. Ferro cement, FRP, FRC and its applications.				
UNIT – II	CONCRETE CONSTRUCTION - I	18			
	Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap Concrete floors (PCC), walls and partitions. Concrete lintels, sunshades. Concrete beams and columns and slabs – one-way and two-way slabs.				
UNIT –III	CONCRETE CONSTRUCTION - II	15			
	Pre cast concrete wall, cast in situ wall, pre cast building elements, pre stressed concrete and its applications. Post & Pre tension concrete.				
UNIT –IV	CONCRETE STAIRCASES	20			
	Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever – foundations, finishes for staircases - detailing out of handrails and balusters. Designing and detailing for physically handicapped.				
UNIT –V	FORMWORKS & SCAFFOLDING	10			
	Fundamentals of formworks and scaffolding. Different types and its applications. Case studies and examples.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	30	0	45	75	

TEXT

1. Dr.B.C.Punmia, Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 1993.
2. Francis D.K.Ching, Building Construction Illustrated VNR, 1985.

REFERENCES

1. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
2. Alan Banc, Stairs, Steps and Ramps, Butter worth Heinemann Ltd., 1996
3. M.S.Shetty, Concrete Technology, S.Chand & Co. Ltd., New Delhi, 1986.
4. W.B.Mckay Building Construction, Longmans, UK, 1981.

SUBCODE	SUB NAME	L	T	P	C
XAR 506	COMPUTER APPLICATIONS IN ARCHITECTURE - II	0	0	2	3
C:P:A	0.5:2.0:0.5	L	T	P	H
		0	0	2	4
UNIT – I	INTRODUCTION				4
	Definition of Computer-based Animation, Basic Types of Animation: Real Time, Non-real-time, Definition of Modelling, Creation of 3D objects. Exploring the Max Interface, Controlling & Configuring the Viewports, Customizing the Max Interface & Setting Preferences, Working with Files, Setting Object Properties & Duplicating Objects, Creating & Editing Standard Primitive & extended Primitives objects, Transforming objects, etc.				
UNIT – II	2D SPLINES & SHAPES & COMPOUND OBJECT				8
	Understanding 2D Splines & shape, Extrude & Bevel 2D object to 3D, Understanding Loft & terrain, Modeling simple 4 objects with splines, Understanding morph, scatter, conform, connect compound objects, blobmesh, Boolean, Proboolean & procutter compound object.				
UNIT– III	3D MODELLING				20
	Modeling with Polygons, using the graphite, working with XRefs, Building simple scenes, Building complex scenes with XRefs, using assets tracking, deforming surfaces & using the mesh modifiers, modeling with patches & NURBS				
UNIT – IV	KEYFRAME ANIMATION				8
	Creating Keyframes, Auto Keyframes, Move & Scale Keyframe on the timeline, Animating with constraints & simple controllers, animation Modifiers & complex controllers, function curves in the track view, motion mixer etc.				
UNIT – V	SIMULATION & EFFECTS				12
	Bind to Space Warp object, Gravity, wind, displace force object, deflectors, FFD space warp, wave, ripple, bomb, Creating particle system through p-array, understanding particle flow user interface, how to particle flow works, hair & fur modifier, cloth & garment maker modifiers etc.				
UNIT – VI	LIGHTING & CAMERA				8
	Configuring & Aiming Cameras, camera motion blur, camera depth of field, camera tracking, using basic lights & lighting Techniques, working with advanced lighting, Light Tracing, Radiosity, video post, mental ray lighting etc.				
UNIT– VII	TEXTURING WITH MAX				8
	Using the material editor & the material explorer, creating & applying standard materials, adding material details with maps, creating compound materials & material modifiers, unwrapping UVs & mapping texture, using atmospheric & render effects etc.				

UNIT – V	RENDERING WITH V-RAY	8
	V-ray light setup, V-ray rendering settings, HDRI Illumination, Fine-tuning shadows, Final render setting etc.	
	LECTURE	TUTORIAL
	0	0
	PRACTICAL	TOTAL
	60	60
TEXT		
1. TedBoardman, 3dsmax7 Fundamentals, Techmedia		
2. Michael E. Mortenson, 3D Modelling, Animation, and Rendering, Createspace		

SUBCODE	SUB NAME	L	T	P	C
XAR 507	ARCHITECTURAL DESIGN - IV	0	0	6	10
C:P:A	3.0:4.0:3.0				
		L	T	P	H
		0	0	7	14
UNIT – I	DESIGN STUDIO				21
					0
<p>Scale and Complexity: Buildings and small complexes that address the social and cultural needs of contemporary urban life (residential. commercial, institutional); multi bayed, multiple storeys, circulation intensive; passive and active energy</p> <p>Areas of concern/ focus</p> <ul style="list-style-type: none"> • Socio-cultural and economic aspects • Designing for the differently abled • Building byelaws and rules • Appropriate materials and construction techniques, detailing <p>Design Examples:</p> <p>The building project shall be of housing typologies – detached, attached, group housing and so on. Shopping centers (Commercial) Home for aged, apartments (residential) Health centers, Nursing homes (institutional) etc.</p> <p>Introduction to three-dimensional modeling of spaces using Computer. Construction and manipulation of three-dimensional building databases, Rendering 3D images and Presentation techniques.</p>					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	0	0	210	210	
TEXT					
1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.					
2. Ernst Neuferts Architects Data, Blackwell 2002.					
REFERENCES					
1. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976.					
2. P&D Act 1995.					
3. E and O.E. Planning. Liffie Books Ltd., London, 1973.					
4. National Building Code and Bureau of Indian standard publications.					

SUBCODE	SUB NAME	L	T	P	C
XAR601	VERNACULAR ARCHITECTURE	3	0	0	3
C:P:A	2.5:0.5:0	L	T	P	H
		3	0	0	3
UNIT – I	INTRODUCTION				7
	Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology- Cultural and contextual responsiveness of vernacular architecture: an overview				
UNIT – II	APPROACHES AND CONCEPTS				10
	Different approaches and concepts to the study of vernacular architecture: an overview – Aesthetic, Architectural and anthropological studies in detail				
UNIT – III	VERNACULAR ARCHITECTURE OF THE WESTERN AND NORTHERN REGIONS OF INDIA				12
	Forms spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following: - Deserts of Kutch and Rajasthan; Havelis of Rajasthan - Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims - Geographical regions of Kashmir; house boats.				
UNIT – IV	VERNACULAR ARCHITECTURE OF SOUTH INDIA				10
	Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following: - Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace. - Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams				
UNIT – V	WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA				6
	Colonial influences on the Tradition Goan house - Evolution of the Bungalow from the traditional bangla, Victoria Villas – Planning principles and materials and methods of construction. Settlement pattern and house typologies in Pondicherry and Cochin.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		45	0	0	45
TEXT					
1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.					
2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.					
3. R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.					
REFERENCES					
1. V.S. Pramar, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.					
2. Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992. 63					
3. G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.					
4. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.					
5. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000					

SUBCODE	SUB NAME	L	T	P	C	
XAR 603	ESTIMATION, COSTING AND VALUATION	2	0	0	2	
C:P:A =	1.875:0.375:0.75	L	T	P	H	
		2	0	0	2	
UNIT – I	INTRODUCTION TO ESTIMATION					3
	Definition, Aim and object, Scope and importance of subject. Types of Estimates Approximate and detailed. Units of measurement for different items.					
UNIT – II	METHODS OF ESTIMATION					6
	Preparation of data and analysis of Rates for Civil Work items – as per Municipal or P. W. D. Schedule Rates and Current market rates, Units for rates. Taking of Quantities for Civil Work of Load Bearing Wall structure and preparation of abstract. Taking of Quantities of Civil Works of R. C. C. Frame Building, and preparation of abstract.					
UNIT – III	COST ESTIMATION					8
	Preparation of data and analysis of Rates for Civil Work items – as per Municipal or P. W. D. Schedule Rates and Current market rates, Units for rates. Taking of Quantities for Civil Work of Load Bearing Wall structure and preparation of abstract. Taking of Quantities of Civil Works of R. C. C. Frame Building, and preparation of abstract.					
UNIT – IV	RATE ANALYSIS					8
	Analysis of rates – using standard data and schedule of rates for conventional items – principles of pricing for new items.					
UNIT – V	VALUATION					5
	Necessity – basics of valuation – capitalized value – depreciation – escalation – value of property – calculation of Standard rent – Report preparation.					
		LECTURE	TUTORIAL	PRACTICAL	TOTAL	
		30	0	0	30	
TEXT						
1. S.C. Rangwala, Elements of Estimating and Costing, Charoter Publishing House, India.						
REFERENCES						
1. Dutta, Estimating and Costing, S.Dutta and Co., Lucknow						
2. W.H.King and D.M.R.Esson, Specification and Quantities for Civil Engineers, The English University Press Ltd.						
3. T.N.Building Practice, Vol.1, Civil, Govt. Publication.						
4. P.W.D. Standard specifications, Govt. Publication.						
e- REFERENCES						

SUBCODE	SUB NAME	L	T	P	C
XAR 605	MATERIALS AND CONSTRUCTION - V	1	0	2	3
C:P:A =	2.4:0:0.6	L	T	P	H
		1	0	2	5
UNIT – I	CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATION				6
	Study of construction system innovated through research organizations like CBRI, NBO, SERC, etc. Floor, wall and roofing systems. Ferrocement its properties, uses and application in building construction including the techniques of preparation, casting, curing, etc.				

UNIT – II	FOUNDATIONS	30		
	Pile foundation, different types of piles, precast and cast insitu with reinforcement details for different types of grids, details of pile capping, jointing of precast piles and columns.			
UNIT – III	VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS	5		
	Elevators - Historical development of elevators or lifts. Elevators - size, capacity, speed, mechanical safety method, positioning of core under planning grid. Types of elevators - Electric, hydraulic - passenger, hospital, capsule, freight, etc. Dumb waiters, details of lift shaft and other mechanism. Detailing and fitting for physically handicapped. Regenerative drives – speed converters. Fire lift tower – Solae			
UNIT – IV	ESCALATORS AND CONVEYORS	28		
	Escalator types - Parallel and criss cross escalators, horizontal belt conveyors, horizontal moving walkways - concern for physically handicapped mechanical safety systems and automatic control. Speed conveyors – cables – sky lobby. Elevator Research			
UNIT – V	MISCELLANEOUS STRUCTURES	6		
	Shell structures, domes, space frame, shell barrel vault, folded plate structures, tensile structures, pneumatic structures, and etc			
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	15	0	60	75
TEXT				
1. J.H. Callender, Time Saver Standard for Architectural Design Data, McGraw- Hill, 1994. 2. James Ambrose, Building Construction, Service Systems, Van No strand Reinhold, New York, 1992.				
REFERENCES				
1. H.A Thiruvananthapuram – Hand Book on Elevators – Printing and Publishing co – 1997. 2. United Technologies –OTIS – Tell me About Escalators – Printed in USA – 1990. 3. Pamphets supplied and other literatures from N.B.O., SERC, CBRI, 1970 onwards. 4. R..Chudley, Construction Technology, Richard Clay (Chaucer Press) Ltd., Suffolk, 1978.				

SUBCODE	SUB NAME	L	T	P	C
XAR606	ARCHITECTURAL WORKING DRAWING AND SPECIFICATIONS	0	0	2	2
C:P:A =	1:0.5:0.5	L	T	P	H
		0	0	4	4
UNIT – I	ARCHITECTURAL WORKING DRAWING	45			
	RIBA stages of work, Tender documentation, Structure of Information, Primary structuring and secondary structuring of Working drawing, drawing numbering systems. Construction drawings of allied discipline – structural, Mechanical, electrical and Plumbing. Preparation of Working drawing for a residential, commercial project - Foundation plans, Centre line plans, all floor plans, Elevations and Sections, Door window schedules, Part Wall Sections, Blown up details, Staircase details, Kitchen details, Toilet and Bath details, approval drawing.				

UNIT – II	SPECIFICATION WRITING				15
	Necessity of specification, importance of specification, - How to write specification, - Types of Specification, -Principles of Specification writing, - Important aspects of the design of specification – sources of information – Classification of Specification. Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second class brickwork, Damp proof course, ceramic tiles/marble flooring and dadoo, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace. Specification writing of simple residential building & commercial building.				
		LECTUR E 0	TUTORIA L 0	PRACTICA L 60	TOTAL 60
TEXT					
1. The Professional Practice Of Architectural Working Drawings, Osamu A. Wakita; Richard M. Linde, Wiley 2002.					
REFERENCES					
1. .Working Drawing Handbook, Keith Styles, Architectural Press 1995					

SUBCODE	SUB NAME	L	T	P	C
XAR607	ARCHITECTURAL DESIGN - V	0	0	7	10
C:P:A =	1.5:1.5:3	L	T	P	H
		0	0	7	14
UNIT – I	DESIGN STUDIO				180
	Design of large structures - Multiuse, multispans, multilevel - building types involving technology and services – Concentrating in the interior designing - Design and detailing for movement and use by physically challenged people within and around building. Design of green and sustainable buildings. Areas of concern/focus: Exploring the relationship between building, space, landscape and movement in a context involving diverse user groups. Examples: College, office buildings (Institutional) Large Commercial Complex (Commercial) Resorts (Recreational) - Mixed Residential Developments (Residential) etc. Working drawings for any one design Using Computer for presentation Skills.				
		LECTURE	TUTORIAL	PRACTICAL	TOTAL
		0	0	210	210
TEXT					
1. Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. - 2002 2. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.					
REFERENCES					
1. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976. 2. P&D Act 1995. 3. E and O.E. Planning. Lliffee Books Ltd., London, 1973. 4. National Building Code and Bureau of Indian standard publications					

SUBCODE	SUB NAME	L	T	P	C
XAR 701	URBAN ECONOMICS & SOCIOLOGY	2	0	0	2
C:P:A	1:1:3	L	T	P	H
		2	0	0	2
UNIT – I ROLE OF URBAN ECONOMICS & SOCIOLOGY					5
Subject matter of Economics and Sociology as related to built environment.					
UNIT – II URBAN ECONOMICS					6
Principles of consumption, production and distribution and their relevance's; market demand and supply and price changes, laws of returns and urban land values, built environment and municipal taxes.					
UNIT - III COMPONENTS OF PLANNING					8
Various aspects of planning - Land use planning, transportation planning, environmental planning, infrastructure planning. The fundamentals of the land use planning, Zoning principles and basis for formation of zoning laws. Growth management system, infrastructure (Infrastructure, Road, Water supply, Sanitation, Solid Waste Disposal) development and maintenance - Forecasting infrastructure needs of the town based on set of parameters such as population and size of the city, growth trend. Development Control Regulations and bye-laws, standards, CZR in India. Critical analysis of standards. ICT in city management.					
UNIT - IV URBAN PLANNING AND URBAN RENEWAL					6
Tools and techniques utilized at the local, regional, and state level –master plan, structure plan, and zonal plan. Local Governance and Administration: Objectives, Functions, Responsibilities and Organizational structure of: (i) Village Panchayats (ii) Municipalities (iii) Corporations and (iv) Urban Development Authorities. Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – Govt. schemes – case studies.					
UNIT - V CITIES -PARADIGM OF SOCIO POLITICAL EXPRESSION					5
Self sustained communities – SEZ – transit development – integrated townships – case studies. Cities as symbolic expressions of power – Chandigarh, Delhi, Bhubaneshwar, Brasilia, Regulations and standards in India. Critical analysis of standards.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	30	0	0	30	
TEXT					
1. Gallion Arthur B & Eisner Simon, The Urban Pattern: City Planning and Housing. 2. UDPFI guidelines 3. Town and Country Planning Act 1971 with amendments 4. John Radcliffe, An Introduction to Town and Country Planning.					
REFERENCES					
1. C.L. Doxiadis, Ekistics, “An Introduction to the Science of Human Settlements”, Hutchinson, London, 1968. 2. Government of India, “Report of the National Commission on Urbanisation”, 1988. 3. Andro D. Thomas, “Housing and Urban Renewal”, George Allen and Unwin, Sydney, 1986. 4. Rodwin, Lloyd, ed., 1987. Shelter, Settlements and Development (Hemel Hempstead, United Kingdom, Unwin Hyman Ltd.) 5. Town and country planning Act 1971 with amendments					

SUBCODE	SUB NAME	L	T	P	C
XAR 702	ADVANCED BUILDING SERVICES	3	0	0	3
C:P:A	1.8:0:1.2				
		L	T	P	H
		3	0	0	3
UNIT – I INTRODUCTION					5
Introduction to Advanced Building Services. Basics of Building Management Systems (BMS), Integrated Building Management Systems (IBMS), Building Information Modeling (BIM) and Building Automation System (BAS). Scope and Importance of Building Management Systems.					
UNIT – II BUILDING INFORMATION MODELLING AND CONTROLLERS					10
Importance of Building Information Modeling (BIM), Tools used in BIM, facility operation using BIM. Controllers -Types and functions, Occupancy, Integration using Internet protocol.					
UNIT – III ASPECTS OF BUILDING MANAGEMENT SYSTEM					12
HVAC management – Central plant, Chillers, Cooling towers, VAV, AHU, Exhaust systems, Lighting management, Electrical systems management, Plumbing and Fire fighting systems management - detectors and alarm system integration with BMS. Energy management systems. Case study examples.					
UNIT – IV SAFETY AND SECURITY SYSTEMS					12
Access control systems, Closed circuit television, Intruder Alarm, Perimeter protection, Safety system integration with BMS.					
UNIT – V ADVANCEMENTS IN BUILDING MANAGEMENT SYSTEM					6
Advancements in the field of Building Management System. Intelligent buildings, Role of BMS in energy efficiency and maintenance cost. Case study examples.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	
TEXT					
1.Mechanical and Electrical Equipment for buildings, Benjamin Stein, John.S.Reynolds, Walter.T.Grondzik, Alison.G.Kwok, 10th edition, John Wiley and Sons, London, 2006.					
REFERENCES					
<ol style="list-style-type: none"> 1. Smart Buildings Systems for Architects,Owners and Builders -By James M Sinopoli. 2. Intelligent Buildings and Building Automation - By Shengwei Wang. 3. Introduction to Building Management - By D. Coles, G. Bailey, R E Calvert. 4. Building Energy Management Systems: Application to Low-Energy Hvac and Natural Ventilation Control- By G. J. Levermore. 5. Smart grid home- By Quentin Wells. 					

SUBCODE	SUB NAME	L	T	P	C
XAR 703A	PROJECT MANAGEMENT & TQM	3	0	0	3
C:P:A	2:0:3				
		L	T	P	H
		3	0	0	3
UNIT – I INTRODUCTION TO PROJECT MANAGEMENT					5
Project management concepts-objectives, planning, scheduling Controlling and role of decision in project management. Traditional management system, Gantt's approach, Load chart. Progress Chart, Development of bar chat, Merits and Demerits.					

UNIT – II PROJECT PROGRAMMING AND ANALYSIS				15
Project Network-Events Activity, Dummy, Network Rules, Graphical Guidelines for Network, Numbering the events, Cycles, Development of Network-planning for Network Construction, Models of Network construction, steps in development of Network. Work Break Down Structure, hierarchies. Concepts: critical path method-process, activity time estimate, Earliest Event time, Latest allowable Occurrence time, start and finish time of activity, float, critical activity and critical path problems. Cost model-Project cost, direct cost, indirect cost, slope curve, Total project cost, optimum duration contracting the network for cost optimization. Steps in cost optimization, updating, resource allocation-resource smoothing, resource leveling.				
UNIT – III PROGRAMMING EVALUATION REVIEW TECHNIQUE				10
PERT network, introduction to the theory of probability and statistics. Probabilistic time estimation for the activities for the activities of PERT Network.				
UNIT – IV COMPUTERIZED PROJECT MANAGEMENT				10
Introduction: Creating a New project, building task. Creating resources and assessing costs, Refining your project. Project Tracking-Understanding tracking, recording actual. Reporting on progress. Analyzing financial progress.				
UNIT – V TOTAL QUALITY MANAGEMENT				5
Introduction to TQM principles, TQM tools, SPC tools and quality systems - Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS16949, ISO 14000 – Concepts, Requirements and Benefits.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45
TEXT				
1. S.C.Rangwala, Elements of Estimating and Costing, Charoter Publishing House, India.				
REFERENCES				
1. Dutta, Estimating and Costing, S.Dutta and Co., Lucknow				
2. W.H.King and D.M.R.Esson, Specification and Quantities for Civil Engineers, The English University Press Ltd.				
3. T.N.Building Practice, Vol.1, Civil, Govt. Publication.				
4. P.W.D. Standard specifications, Govt. Publication				

XAR703 B ADVANCED BUILDING TECHNOLOGY 3 - 0 - 0 - 3

OBJECTIVES:

The course is designed to enable the students to learn advanced building technology available for construction.

SUBCODE	SUB NAME	L	T	P	C
XAR703B	ADVANCED BUILDING TECHNOLOGY	3	0	0	3
C:P:A = 2:0:3					
		L	T	P	H
		3	0	0	3
UNIT – I MODERN MATERIALS					5
Dry wall construction, Special Use of waste products and industrial by-products in concrete making-smart materials– Geo-textiles and geo-synthetics – nano materials.					

UNIT – II MODERN CONSTRUCTION METHODS				10
Tall buildings structural systems – Rigid frames – Braced frames – Shear wall – Buildings – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Types – single, double & multilayered grids – two way& three way space grids, connectors, Grids – Domes - various forms. examples of tensile membrane structures – types of pneumatic structures. Biomimetics -Definition, Replicating natural manufacturing methods as in the production of chemical compounds by plants and animals; Mimicking mechanisms found in nature, Imitating organizational principles from social behavior of organisms; Examples: Spider-silk as a substitute for steel, Lotus effect in self-cleansing glass, Dinosaur spine in bridge design, Lily pad structure, termite mound cooling system, swarm theory, aerodynamic structures etc.				
UNIT – III PREFABRICATION AND CONSTRUCTION TECHNIQUES				15
Modular co-ordination, standardization and tolerances-system of prefabrication. Pre-cast concrete manufacturing techniques, Moulds –construction design, maintenance and repairPre-casting techniques - Planning, analysis and design considerations -. Joints -Curing techniques including accelerated curing such as steam curing, hot air blowing etc., -Test on precast elements - skeletal and large panel constructions - Industrial structures. Pre-cast and pre-fabricating technology for low cost and mass housingschemes. Small pre-cast products like door frames, shutters, Ferro-cement in housing - Water tank service core unit. Quality control - Repairs and economical aspects on prefabrication				
UNIT – IV DEMOLITION				5
Advanced techniques and sequence in demolition and dismantling of buildings.				
UNIT – V SAFETY ASPECTS INVOLVED IN CONSTRUCTION				10
Construction accidents - Construction Safety Management: - Environmental issues in construction - occupational and safety hazard assessment. Safety Programmes - Job-site assessment - Safety in hand tools- Safety in grinding- Hoisting apparatus and conveyors- Safety in the use of mobile cranes- Manual handling- Asbestos cement roofs-Safety in demolition work- Trusses, girders and beams-First- aid- Fire hazards and preventing methods- fire accidents - earthquake resistant design of buildings.				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45
TEXT				
1. Peurifoy, R.L., Ledbette. W.B., Construction Planning, Equipment and Methods, McGraw Hill Co., 2000.				
2. Jimmy W. Hinze, Construction Safety, Prentice Hall Inc., 1997.				
REFERENCES				
1. Richard J. Coble, Jimmie Hinze and Theo C. Haupt, Construction Safety and Health Management, Prentice Hall Inc., 2001.				
2. Hand Book on Construction Safety Practices, SP 70, BIS 2001.				
3. N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.				
4. John Fernandez, Material Architecture, Architectural Press, UK.				

OBJECTIVES:

To evaluate the understanding of the relationship between form& structure through a seminar.

SUBCODE	SUB NAME	L	T	P	C
XAR 803C	ARCHITECTURE AND STRUCTURE	3	0	0	3
C:P:A = 3:1:0					
		L	T	P	H
		3	0	0	3
UNIT – I HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA					6
Development of monolithic and rock cut structures- trabeated construction-arcuate construction vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.					
UNIT – II HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD					7
Post Industrial modular construction of large span and suspension structures in steel and concrete- projects of Pier Luigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.					
UNIT – III CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I					10
The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Stansted Airport Terminal, London, UK by Fosters/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw					
UNIT – IV CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II					15
The select case studies could include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Reno Piano Building Workshop					
UNIT – V SEMINAR					7
Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	
TEXT					
1. Shigeru Ban,McQuaid, Matilda, Engineering and Architecture: Building the Japan Pavilion, Phaidon Press Ltd, UK, 2008					
2. Cox Architects, The images publishing group, Australia, 2000 3. Masted structures in architecture, James B Harris, architect.; Kevin Pui-K Li, Oxford ; Boston : Architectural Press, 2003					
REFERENCES					
1. Martorell, Bohigas& Mackay, Pavilion of the Future, Expo 92, Seville (MBM),1992.					
2. P. COX, Daring Harbour Expo Center, Sydney Australia					
3. EnricMiralle& Carme Pinos, Olympic Archery Building, 857072 COH					
4. Prada Aoyama Tokyo Herzog & De Meuron. Milan,IT: Progetto Prada ArteSrl, 2003					
5. Christopher Beorkrem, Material Strategies in Digital Fabrication, Routledge,Taylor& Francis Group, 2013					

SUBCODE	SUB NAME	L	T	P	C
XAR704A	INTERIOR DESIGN AND DETAILING	1	0	1	3
C:P:A = 4:1:0		L	T	P	H
		1	0	2	3
UNIT – I INTRODUCTION TO INTERIOR DESIGN					9
Definition of interior design - Interior design process - Vocabulary of design in terms of principles and elements - Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design. Influence of historical styles, folk arts in interior design.					
UNIT – IIELEMENTS OF INTERIOR DESIGN - ENCLOSING ELEMENTS					9
Concept & theme Development: Enclosures & envelops to formulate the volumes, response to functional spaces; Functionality: Spatial organization& Planning; different treatment methods for walls, floor, ceilings, services. Derivation of quantitative aspect of spaces based on User - Activity Analysis, furniture / equipment, Anthropometry, Ergonomics, Layout, Circulation, etc.; qualitative aspects based on ambience.					
UNIT – III ELEMENTS OF INTERIOR DESIGN– LIGHTING ACCESSORIES & INTERIOR LANDSCAPING					9
Technical decisions -Constructional details &Material specification - Exploration & selection responding to functionality & aesthetics; Decisions for aesthetics: Color, textures, patterns, surface finishes, ornamentation, furnishings, accessories, lighting, interior Landscaping, etc. with reference to visual comfort & ambience in the interiors.					
UNIT – IV ELEMENTS OF INTERIOR DESIGN – FURNITURE DESIGN & SPACE PLANNING					9
Study of the relationship between furniture and spaces - human movements & furniture design as related to human comfort - Function, materials and methods of construction - - Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. – Design Projects on Residential, Commercial and Office Interiors.					
UNIT – V INTERIOR DESIGN PROJECTS					9
Develop a working drawing for interior design detailing for office spaces, hotel lobbies etc. Residential/ commercial / Retails / Offices / Institutional / Hospitality / Recreational / Sports / Healthcare / Others. Site extent: Ranges from 200 m ² to 600 m ² .					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	15	0	30	45	
TEXT					
1. Francis .D.K. Ching, <i>Interior Design Illustrated</i> , V.N.R. Pub., NY 1987. 2. Julius Penero and Martin Zelnik, <i>Human Dimensions and Interior space Whitney Library of Design</i> , NY 1979.					
REFERENCES					
1. Steport - De Van Kness, Logan and Szebely, <i>Introduction to Interior Design</i> Macmillan Publishing Co., NY 1980. 2. <i>Inca / Interior Design Register</i> , Inca Publications, Chennai, 1989. 3. Kathryn .B. Hiesinger and George H.Marcus, <i>Landmarks of twentieth Century Design</i> ; Abbey Ville Press, 1993. 4. SyanneSlesin and Stafford Ceiff - <i>Indian Style</i> , Clarkson N. Potter, Newyork, 1990. 5. History of Interior design &furnitures ,Blakemore.R 6. T.S.S. for Interior design & spaces, Chiara joseph 7. Interior Design Illustrated, Ching D.K. 8. Interior Design and Decoration, Premavathyseetharaman					

Course objectives:

1. To understand the fundamentals of Earthquake and the basic terminology
2. To provide basic knowledge of earthquake resistant design concepts.
3. To inform the performance of ground and buildings.
4. To familiarize the students with design codes and building configuration
5. To understand the various types of construction details to be adopted in a disaster prone area.

SUBCODE	SUB NAME	L	T	P	C
XAR 704 B	DISASTER RESISTANT ARCHITECTURE	3	0	0	3
C:P:A = 0.6:0.8:0.8					
		L	T	P	H
		3	0	0	3
UNIT I NATURAL HAZARDS AND MAN MADE HAZARDS					9
Introduction to Disaster Management – Contemporary, Natural and Man-made Disasters- Natural Hazards – Fundamentals of Disasters, Causal Factors of Disasters, Poverty, Population Growth, Rapid Urbanization, Transitions in Cultural Practices, Environmental Degradation, War and Civil Strife - brief description on cause and formation of flood, cyclone, earthquake, Tsunami and Landslides. Zoning and classification by center/ state government organizations. Geologic Hazards and Natural disasters – how to recognize and avoid them – hazards of faulting – hazards of geologic foundations. Man made hazards – fire, gas and chemical leakages, pollution and health hazards, manmade disasters – vulnerability analysis and risk assessment					
UNIT II CONCEPTS FOR DISASTER RESISTANT DESIGN					9
Vernacular and historical experiences – case studies. Site selection and site development – building forms – Effects of cyclone, tsunami, hurricanes and seismic forces related to building configuration – spatial aspects – contemporary/ international approaches for low rise, mid-rise and high rise buildings. Innovations and selection of appropriate materials – IS code provisions for buildings – disaster resistant construction details.					
UNIT III FUNDAMENTALS OF EARTHQUAKE AND BUILDING CONFIGURATION					9
Fundamentals of earthquakes - Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India- Predictability, intensity and measurement of earthquake - Basic terms- fault line, focus, epicentre, focal depth etc. Site planning, performance of ground and buildings - Historical experience, site selection and development - Earthquake effects on ground, soil rupture, liquefaction, landslides- Behaviour of various types of building structures, equipments, lifelines, collapse patterns - Behaviour of non-structural elements like services, fixtures in earthquake - prone zones Seismic design codes and building configuration - Seismic design code provisions – Introduction to Indian codes- Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings- like short stories, short columns etc.					
UNIT IV EARTHQUAKE RESISTANT DESIGN					8
Various types of construction details a) Seismic design and detailing of non-engineered construction- masonry structures, wood structures, earthen structures. b) Seismic design and detailing of RC and steel buildings c) Design of non-structural elements- Architectural elements, water supply, drainage, electrical and mechanical components					
UNIT V POST OPERATIVE MEASURES FOR DISASTER MANAGEMENT					10
Methods to minimize damage to utilities – plaster / wall boards / furnishings/ swimming pools / antennas / free standing retaining masonry walls other remedies and post operative measures – cyclone and earthquake insurance – training for before and after natural hazards and ways to protect family, property and oneself from natural calamities. Role of international, national and state bodies – CBRI, NBO and NGOs in disaster mitigation and community participation.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	

TEXT

1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India), 2004.
2. C.V.R Murthy, Andrew Charlson. "Earthquake design concepts", NICEE, IIT Kanpur, 2006.
3. Agarwal.P, Earthquake Resistant Design, Prentice Hall of India, 2006.

REFERENCES

1. Ian Davis, "Safe shelter within unsafe cities: Disaster vulnerability and rapid urbanization", Open House International, UK, 1987
2. Socio-economic developmental record- Vol.12, No.1, 2005
3. Mary C. Comerio, Luigia Binda, "Learning from Practice- A review of Architectural design and construction experience after recent earthquakes" - Joint USA-Italy workshop, Oct.18-23, 1992, Orvieto, Italy.

SUBCODE	SUB NAME	L	T	P	C
XAR 705	SEMINAR	0	0	1	2
C:P:A	1.8:0:1.2	L	T	P	H
		0	0	1	2
UNIT – I INTRODUCTION ABOUT STUDY OF ARCHITECTURAL SUBJECTS					5
A detailed methodology about how the process of evolution happens in the varied aspects of Architecture together with a research curiosity.					
UNIT II BASICS OF DOCUMENTING ARCHITECTURAL CONCEPTS					1
					5
Architecture being a wide spectrum includes various methods of design evolution from product based to process based. Documenting the same through manual sketches, cognitive mapping techniques and compiling the information and presenting through both report form and visual presentation.					
UNIT III BASICS ABOUT PRESENTING BEFORE A COMMON FORUM					10
Create various situations encountering the communication ability of students. Basic exposure towards expressing the concepts of architecture and design through proper manner such as body language, boldness and clear content awareness in subject to be spoken.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	30	0	0	30	

SUBCODE	SUB NAME	L	T	P	C
XAR 706	ARCHITECTURAL DESIGN – VI	0	0	8	8
C:P:A	3.2:3.2:1.6	L	T	P	H
		0	0	1	16
				6	
DESIGN STUDIO					21
					0
Design of large scale projects involving energy efficient and green building design. Examples: Five star hotel, airports, cultural centers, museum and exhibition complex, neighborhood design, housing projects, etc					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	0	0	210	210	

TEXT

1. D. Gosling and Maitland - Urban Design - St. Martins Press 1984.
2. Ian Bentley - Responsive Environment - A manual for Designer - Architecture Press, London - 1985.

REFERENCES

1. E and OE planning 11iffe Books Ltd, London 1973.
2. P&D Act 1995.
3. Edward D Mills planning 4 volumes Newnes - Butterworths, London 1976.
4. Gordon Cullen - the concise Townscape - The Architectural press

XAR 801 PRACTICAL TRAINING**0 – 0 – 0 -4**

SUBCODE	SUB NAME	L	T	P	C
XAR 801	PRACTICAL TRAINING	0	0	0	4
C:P:A	3:1:0				
		L	T	P	H
		0	0	0	100
<p>The Practical Training would be done in offices / firms in India empanelled by the Institution in which the principal architect is registered with the Council of Architecture if the firm is in India or in an internationally reputed firm established abroad. The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees. The students would be evaluated based on the following criteria: 1. Adherence to time schedule, Discipline. 2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings</p> <p>3. Ability to work as part of a team in an office. 4. Ability to participate in client meetings and discussions. 5. Involvement in supervision at project site. At the end of the Practical Training a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.</p>					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
		0	0	100 days	

XAR 901 - PROFESSIONAL PRACTICE & ETHICS**3 – 0 – 0 – 3****UNIT – I ARCHITECT AND PROFESSION****9**

Role of architect in society - role of IIA and COA – Salient features of Architects' Act 1972 - code of conduct, Partial/ Comprehensive Architectural service, Conditions of engagement of an architect - normal additional, special and partial services – scale of fees for various services - claiming of fees - relationship with client and contractor – management of an architect's office - elementary accountancy.

UNIT – II ARCHITECTURAL COMPETITIONS**8**

Types of competitions - appointment of assessors - duties of assessors - instructions to participants - rejection of entries - award of premium - guidelines prescribed by COA & IIA for promotion and conduct of competitions

UNIT – III EASEMENTS and ARBITRATION**8**

Easements -Definition - types of easement – acquisition extinction and protection of easements - Arbitration in disputes - arbitration agreement - sole arbitration - umpire - accepted matters and – award

UNIT – IV TENDER and CONTRACT**8**

Calling for tenders - tender documents - open and closed tenders - item rate, lump sum, labour and demolition tender - conditions of tender - submission of tender - scrutiny and recommendations. Conditions of contract - Form of contract articles of agreement - Contractor's bill certification

UNIT – V BUILDING RULES and legislation**12**

The Building Rules and By laws - Panchayat , Municipal, Corporation. Role of Local Authorities and Local Planning Authorities Development Control Rules – Chennai Metropolitan Development Authority Environmental Acts and Laws, Fire Safety Rules – Role of EIA Committee Need for special rules on architectural control and development -Special Rules governing Hill Area Development - coastal area development - Heritage Act of India - Role of urban Arts Commission, Tamil Nadu Factory Rules

TEXT BOOKS:

1. Publications of COA IIA Hand book on Professional Practice, The Architects publishing Corporation of India, and Bombay 1987
2. Roshan Namavathi, Professional Practice, Lakshmi Book Depot, Mumbai 1984

REFERENCES:

1. J.J. Scott, Architect's Practice, Butterworth, London 1985
2. D.C. Rules for Chennai Metropolitan Area 1990
3. T.N.D.M. Building Rules, 1972
4. T.N.P. Building Rules 1942
5. Chennai City Corporation Building Rules 1972
6. Derek Sharp, The Business of Architectural Practice William Collins Sons & Co. Ltd., Erafton St., London W1 1986
7. The Tamil Nadu Hill Areas Special Building Rules - 1981
8. Environmental Laws of India - by Kishore Vanguri, C.P.R. Environmental Education Centre, Chennai

TOTAL:45

SUBCODE	SUB NAME`	L	T	P	C
XAR 902	HOUSING	3	0	0	3
C:P:A	3:0:0	L	T	P	H
		3	0	0	3
UNIT – I HOUSING ISSUES - INDIAN CONTEXT					8
Need and Demand - National Housing and Habitat Policy - Housing Agencies and their role in housing development. Social factors influencing Housing Design, affordability, economic factors and Housing concepts – Slum Up-gradation and Sites and Services					
UNIT – II HOUSING STANDARDS IN INDIA					8
Standards and Regulations - DCR relevant to housing - Methodology of formulating standards - Performance standards. Traditional patterns - Row Housing and Cluster Housing - Layout concepts - Use of open spaces – Utilities and common facilities - Case studies - High Rise Housing					
UNIT – III HOUSING DESIGN PROCESS					8
Various stages and tasks in Project Development - Housing Management - Community participation -Environmental aspects - Technology. housing finances, financial institutions,					
UNIT – IV REAL ESTATE DEVELOPMENT					14
Property Development Process: The property development process from inception to completion					

; parties involved; legislative and planning requirements including the Housing Developers (Control & Licensing) Act and Rules. Conception of Development Project: Conception of development; pro forma analysis; site identification investigation and options; preliminary drawings. Feasibility Study: Market analysis, including timing of development and real estate cycles. Cash flow analysis. Project Financing: Various financing arrangements including partnerships and joint ventures; project accounts; construction finance. Project Construction: Contract negotiation; types of construction contracts; tendering procedures; project/development management. Real Estate Marketing: Marketing plan, evaluation and control of marketing process. Project Completion: **Handling over and management of completed project**

UNIT – V CURRENT TRENDS IN REAL ESTATE IN INDIA

7

Role of various players in the Real Estate Sector – Land and Land transactions. taxes involved in land transactions.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	0	0	45

TEXT

1. Joseph de chiara & others - Time Saver Standards for Housing and Residential development, McGraw-Hill Co., New York, 1995.
2. .Karnataka state Housing Board - MANE - Publication - 1980.

REFERENCES

1. Richard Untermanu & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company, London/New York, 1977.
2. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.
3. Christopher Alexander, A Pattern Language, Oxford University Press, New York -1977.
4. HUDCO Publications - Housing for the Low income, Sector Model.

XAR 903 (A) -ARCHITECTURAL CONSERVATION

3 – 0 – 0 – 3

UNIT– I INTRODUCTION

6

Definitions of – Heritage, Conservation, preservation, Environmental Conservation - Need for them - Indian Context - Role of architect in such programmes

UNIT– II EVOLUTION AND METHODOLOGY

10

Origin and evolution in history - architectural heritage - Methodology - Stages of development - **Implementation tools and technologies.**

UNIT – III SOCIO -CULTURAL DIMENSION

10

Social, Cultural, economical, and historical values of Conservation programme – Involvement of Community & Social Organisations – public participation – Conflict and compatibility between Conservation and development.

UNIT – IV LEGISLATION AND INSTITUTIONS

11

Special legislation – central and state — administrative aspects – New Concepts and emerging trends in Conservation. Role of UNDP, UNESCO, ICOMOS, ASI, INTACH and other agencies – their involvement.

UNIT– V CASE– STUDIES

8

Indian and International **case Studies** – Success and failure – reasons for it.

TOTAL : 45

REFERENCES:

1. Conservation and Development in Historic Towns and Cities. - Pamela Ward - Orid Press Ltd.
2. Planning for Conservation - Kain Roger, - St. Martin N-Y 1981
3. Recycling Cities – Cutler and Cutter – Canni, Massachussets, 1976
4. Character of Towns an Approach to Conservation - Worskett Roy Architectural Press – London.
5. Guidelines for Conservation by INTACH

SUBCODE	SUB NAME	L	T	P	C
XAR 903D	THEORY OF DESIGN	3	0	0	3
C:P:A = 2.4:0.6:0					
		L	T	P	H
		3	0	0	3
UNIT – I DESIGN					8
Definition of design, understanding of design, purpose of design, nature of good design and evaluation of design, types of design classifications, role of designer, design in history.					
UNIT – II DESIGN THINKING					12
Understanding the terms creativity, imagination, etc. Theories on thinking, convergent and divergent thinking, lateral and vertical thinking, creative techniques like checklists, brainstorming, syntactic, etc. design puzzles and traps, blocks in creative thinking.					
UNIT – III DESIGN PROCESS					8
Context for architectural design problems, design process, stages in the design process from different considerations, different ideas of design methodology.					
UNIT – IV DESIGN PROBLEMS AND SOLUTIONS					7
Different approaches to design, problem solving or intuitive, formulation of problems, nature of creative design problems, goals in design.					
UNIT – V DESIGN CONCEPTS, PHILOSOPHIES AND STRATEGIES					10
Various approaches to generate ideas for architectural design - types of concepts, personal philosophies and strategies of individual designers, channels to creativity in architecture.					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	15	0	30	45	
TEXT					
1. Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences - John Wiley & Sons, New York, 1981.					
2. Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984.					
3. James C. Snyder, Anthony J. Catorex - Introduction to Architecture, McGraw-Hill Inc., 1979. Universal Design Principles					
REFERENCES					
1. Bryan Lauson - How Designers Think, Architectural Press Ltd., London, 1980.					
2. Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984.					
4. Allen Mave Evans & Caula David Dumes Nil, An Invitation to Design, Macmillan Publishing Co., New York, 1982.					
5. Edward De Bono, Lateral Thinking					
6. Christopher Alexander, Pattern Language, Oxford University Press.					

XAR 904 B LANDSCAPE ARCHITECTURE

3 – 0 – 0 – 3

OBJECTIVES:

To familiarize students with the various elements, principle of landscape architecture and develop competency in dealing with the analytic, artistic and technical aspects of landscape design

SUBCODE	SUB NAME	L	T	P	C
XAR 904B	LANDSCAPE ARCHITECTURE	3	0	0	3
C:P:A = 1.2:1.8:0					

		L	T	P	H
		3	0	0	3
UNIT – I INTRODUCTION					6
Introduction to ecology, ecosystem, biosphere – components and working mechanism of ecosystem – types and courses of disturbance in ecosystem – man-made and natural e.g.Dereliction of land – reclamation, conservation and landscaping of derelict land.					
UNIT – IIPLANTING DESIGN					9
Plants as design elements- classification – structural characteristic of plants – visual characteristics of plant viz. line, form, texture, colour, etc. – basic data for plant selection.					
UNIT – IIIELEMENTS IN LANDSCAPE DESIGN					10
f Landscape design - Landscape character – Landscape Composition – Plant Association– Landscape effects-Organisation of spaces- circulation, built form and open spaces- exercises on planning for neighbourhood parks and campus developments. Design Assignment: Plant selection and composition for given situation.					
UNIT – IV HISTORY OF GARDEN DESIGN					10
Study of principles and design – historic styles – Mugal gardens of India: Shalimar Bagh and TajMahal, Japanese gardens: Saihoji, Ryoanji&Katsura imperial palace, Italian Renaissance gardens: Villa Lante at Bagania.					
Landscaping for residential layout – recreational facilities, like parks, play fields- water front areas – hill areas – urban centers like squares, plazas , Consideration and key factors to landscaping of above context.					
Design Assignment : Landscape proposal and Drawing preparation for assigned project					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	45	0	0	45	
TEXT					
1. Landscape Architecture – John Omsbeesimonds . 2.Planting Design – Theodore D Walker.					
REFERENCES					
1. Introduction to landscape design – John L.Motloch. 2. Planting design Handbook – Nick Robinson. 3. Site planning Standards – Joseph dechiara Lee E. Koppelman. 4. Hand Book of Urban Landscape, The Architectural Press, London, 1973, Cliff Tandy. 5. T S S for Landscape Architecture, McGraw Hill, Inc, 1995 6. Landscape planning and Environmental Impact Design , Turner 7. Landscape detailing , Little woods 8. Landscape design . Park C.					

XAR 905 DISSERTATION

0 – 0 – 2 - 4

OBJECTIVES:

To motivate students to involve in individual **research and methodology**.

SUBCODE	SUB NAME	L	T	P	C
XAR 905	DISSERTATION	0	0	2	2
C:P:A	3.2:1.8:0	L	T	P	H
		0	0	4	4
TOPICS OF STUDY					60
The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Preparation of presentation drawings and reports are part of the requirements for submission. METHOD OF SUBMISSION The Dissertation shall be submitted in the form of drawings, project report, CDs and reports.					

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	0	0	60	60

XAR 906 ARCHITECTURAL DESIGN– VI

0 – 0 – 16 – 8

UNIT– I	DESIGNSTUDIO	240
<p>Projects pertaining to Urban Design including Urban Renewal and Redevelopment -Involving intensive study of visual and other sensory relationship between people and their environment, problems concerning both preservation and development based on correlation of socio-economic and physical state and problems pertaining to traffic – Design and detailing for differently-abled at the city/street/buildingscale.</p> <p>Examples: Any part of a city exploring specific urban design typologies and alternatives for revitalization. Hill Architecture, High Tech Buildings, Green buildings, urban nodes/streets/district Large Transportation terminals, Conservation and Re-development, revitalization of historic core, etc.</p> <p>TOTAL : 240</p> <p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. D. Gosling and Maitland - Urban Design - St. Martins Press1984. 2. Ian Bentley - Responsive Environment - A manual for Designer - Architecture Press, London -1985. <p>REFERENCES:</p> <ol style="list-style-type: none"> 3. I.E and OE planning Iliffe Books Ltd, London1973. 4. P&D Act1995. 5. Edward D Mills planning 4 volumes Newnes - Butterworths, London1976. 6. Gordon Cullen - the concise Townscape - The Architecturalpress 		

XAR1001 THESIS

0 – 0 – 0 – 17

TOPICS OF STUDY
The main areas of study and research shall be Architecture, Urban design, Urban renewal, urban and ruralHousing and settlements, Environmental Design, Conservation, Landscape Design, etc. However, thespecific thrust shall be on architectural design and environment context with full understanding.
PRESENTATION REQUIREMENTS
The Thesis Project shall be submitted in the form of drawings, project report, models, Slides, C.D's and reports, as required for the project.
TEXT BOOKS & REFERENCES
As per requirement of Topic and as suggested by the supervisor of Thesis. TOTAL : 450

SUBCODE	SUB NAME	L	T	P	C
XID701	PRACTICAL TRAINING	0	0	0	4
C:P:A	3:1:0	L	T	P	H
		0	0	0	100 days

<p>The Practical Training would be done in offices / firms in India empanelled by the Institution in which the principal architect is registered with the Council of Architecture if the firm is in India or in an internationally reputed firm established abroad.</p> <p>The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.</p> <p>The students would be evaluated based on the following criteria:</p> <ol style="list-style-type: none"> 1. Adherence to time schedule, Discipline. 2. Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings. 3. Ability to work as part of a team in an office. 4. Ability to participate in client meetings and discussions 5. Involvement in supervision at project site. <p>At the end of the Practical Training a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.</p>				
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	0	0	0	100 days

SUBCODE	SUB NAME	L	T	P	C
XID801	THESIS	0	0	0	10
C:P:A	6:4:0	L	T	P	H
		0	0	900	450
TOPICS OF STUDY					
<p>The main areas of study and research shall be Architecture, Urban design, Urban renewal, urban and rural Housing and settlements, Environmental Design, Conservation, Landscape Design, etc. However, the specific thrust shall be on architectural design and environment context with full understanding.</p>					
PRESENTATION REQUIREMENTS					
<p>The Thesis Project shall be submitted in the form of drawings, project report, models, Slides, C.D's and reports, as required for the project</p>					
	LECTURE	TUTORIAL	PRACTICAL	TOTAL	
	0	0	900	450	
TEXT					
As per requirement of Topic and as suggested by the supervisor of Thesis.					
REFERENCES					
As per requirement of Topic and as suggested by the supervisor of Thesis.					

MARCH SYLLABUS

YAR101 EMERGING PRACTICES IN URBAN HOUSING

3 0 0 3

UNIT I - INTRODUCTION	10
Introduction to this building type, 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	10
Review of latest developments in single family and multi family housing by examining the works of WielArets, Shigeru Ban, Ben van Berkel, KeesChristiaanse, Philippe Gazeau, Frank O. Gehry, Steven Holl, Hans Kollhoff, Morger&Degelo, , Jean Nouvel, Kas Oosterhuis, MVRDV	
UNIT III - HIGH DENSITY HOUSING	6
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	10
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	9
Design strategies in the context of Indian metropolitan cities will be explored through a studio exercise	
Total: 45 Hours	
REFERENCES	
<ol style="list-style-type: none"> 1. Manuel Gausa and Jaime Salazer; Housing+ Single Family Housing; Birkhauser- Publishers for Architecture; 2005 2. VinceneGuillart; Sociopolis:Project for a city of the Future; ACTAR; 2004 3. Jingmin ZHOU; Urban housing Forms; Architectural Press; 2005 4. Adrienne Schmitz; Multifamily Housing Development Handbook; Urban Land Institute; 2001 5. CarlesBronto; Innovative Public Housing; Gingko Press; 2005 	

YAR102 APPROPRIATE MATERIALS AND

3 0 0 3

TECHNOLOGY FOR SUSTAINABLE ARCHITECTURE

UNIT I	INTRODUCTION
6	Architecture and the survival of the planet- Assessing patterns of consumption and their alternatives- Profit and politics- Natural building movement – new context for codes and regulations.
UNIT II - DESIGN PRINCIPLES	
12	Principle 1: Conserving energy; Principle 2: Working with Climate; Principle 3: minimizing new resources; Principle 4: respect for users; Principle 5: respect for site; Principle 6: holism- Illustrated with examples.
UNIT III - SUSTAINABLE CONSTRUCTION	
6	Design issues relating to sustainable developmentincluding site and ecology, community and culture, health, materials, energy, and water- Domestic and Community buildings using self help techniques of construction; adaptation, repair and management.-.portable architecture.
UNIT IV - SYSTEMS MATERIALS AND APPLICATIONS	
12	Adobe- Cob- Rammed Earth- Modular contained earth- light clay- Straw bale- bamboo- earthen finishes, etc.- their sustainability; adaptability to climate; engineering considerations, and construction methods; Waste as a resource Portable architecture to Applications through specific case studies.
UNIT V- CASE STUDIES FROM THE CONTEMPORARY SCENARIO	
9	Ranging from small dwellings to large commercial buildings, drawn from a range of countries to demonstrate best current practice. Total: 45 Hours

REFERENCES

1. Brenda and Robert Vale; Green Architecture: Design for a sustainable future; Thames and Hudsson;1996
2. Lynne Elizabeth and Cassandra Adams; Alternative Construction: Contemporary Natural Building Methods
3. Victor Papanek; The Green Imperative; Thames and Hudson; 1995
4. Steven Harris and Deborah Berke; Architecture of the Everyday; Princeton Architectural Press; 1997
5. Pilar Echavarria; Portable Architecture- and unpredictable surroundings; Page One Publishing Pvt. Ltd.; 2005

YAR103 – ADVANCED STUDIES IN REGIONAL AND VERNACULAR ARCHITECTURE
3 – 0 – 0 – 3

SUBCODE	SUB NAME	L	T	P	C
YAR103	ADVANCED STUDIES IN REGIONAL AND VERNACULAR ARCHITECTURE	3	0	0	3
C:P:A	1.8:0:1.2	L	T	P	H
		3	0	0	3
UNIT – I INTRODUCTION					5
Brief introduction to vernacular architecture in global context – concepts and approaches in the study of vernacular architecture.					
UNIT – II VERNACULAR ARCHITECTURE IN INDIAN CONTEXT					8
The different vernacular architectural styles in India with examples. Northern region – Kashmir Architecture , Eastern region – Bengal Architecture, Western Region – Gujarat and kutch architecture, Rajasthan havelis, Southern Region – Kerala and Chettinadu Architecture.					
UNIT – III CONCEPTS AND PRINCIPLES IN VERNACULAR STYLE					12
Study and understand the concepts and principles of Indian vernacular styles in terms of climate response, materials and indigenous construction techniques followed.					
UNIT – IV CASE STUDY OF AN IDENTIFIED SETTLEMENT					15
Detailed study of a traditional settlement and analyzing in terms of the above discussed concepts and principles.					

UNIT – V SUITABILITY IN PRESENT CONTEXT					5
Discussion on the Suitability of the vernacular concepts in present context with examples.					
	LECTURE	TUTORIA	PRACTICA	TOTAL	
	L	L	L		
	45	0	0	45	

REFERENCES

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rappoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. V.S.Praman, Havali- Wooden Houses & Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
4. Kullrishan Jain &Minakshi Jain - Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad, 1992.
5. G.H.R. Tillotsum- The tradition of Indian Architecture Continuity, Controversy - Change since 1850, Oxford University Press, Delhi, 1989.
6. Carmen Kagal, VISTARA - The Architecture of India, Pub: The Festival of India, 1986.

YAR104 - SERVICES IN HIGH RISE BUILDINGS**3 0 0 3**

UNIT 3	I	-	INTRODUCTION
General introduction to Services in both horizontal spread and vertical rise layouts- Standards of high Rise buildings- Aspects and Integration of services- Relative costs- Concepts of Intelligence Architecture and Building Automation			
UNIT 9	II	-	WATER SUPPLY AND WASTE DISPOSAL
Water supply and waste water collection systems- water storage and distribution systems- Planning and Design- Selection of pumps- rain water harvesting – Sewage collection systems and recycling of water- solid waste disposal.			
UNIT 15	III	-	HVAC, Electrical and Mechanical Systems
Natural and Mechanical Ventilation systems- Air conditioning systems and load estimation- Planning and design for efficiency- Automation and Energy Management. Natural lighting systems- Energy efficiency in lighting systems- load and distribution- Planning and Design for energy efficiency- Automation. Types of elevators, systems and services- Lobby design- Escalators - safety principles			
UNIT 6	IV	-	SAFETY AND SECURITY
Security systems- Access Control and Perimeter Protection- CCTV Intruder alarms- Passive fire safety- Fire Detection and Fire Alarm Systems- Planning and Design- NBC.			
UNIT 12	V	-	CASE STUDIES
Case Studies of High Rise, High tech buildings and skyscrapers through appropriate examples- Norman Foster; Ove Arup; Ken Yeang, etc. Total: 45 Hours			
REFERENCES <ol style="list-style-type: none"> 1. A.F.C Sherratt, Airconditioning and Energy Conservation, The Architectural Press, London, 1980. 2. National Building Code. 3. Handbook for Building Engineers in Metric systems, NBC, New Delhi, 1968. 4. Philips Lighting in Architectural Design, McGraw-Hill, New York, 1964. 5. William H. Severns and Julian R. Fellows, Air-conditioning and Refrigeration, John Wiley and Sons, London, 1988. 			

YAR105 - ARCHITECTURAL DESIGN STUDIO –I (HOUSING)**0 0 16 8****Objective:**

To identify and address the issues of Housing in both urban and rural context through precedent studies; literature review; case studies, etc.,. The objective also includes the study of the impact of globalization, real estate development, legal issues involved, policy and infrastructure development.

The design problem shall include the horizontal spread or vertical rise housing projects including by critically analyzing the standards, services, legal issues involved, the principles and [concepts in the present trend and the current technological development](#). **Total: 240 Hours**

YAR 201- CONTEMPORARY: THEORIES AND TRENDS**3 0 0 3****UNIT I - OVERVIEW OF WORLD ARCHITECTURE SINCE 1970****6**

Chronological Development leading to the High-tech architecture also known as Late Modernism or Structural Expressionism, Post Modernism and Deconstructivism

UNIT II - CRITICAL REGIONALISM	8
The idea of critical regionalism - Works of Architects: Studio Granda, Eduardo Souto de Moura, Mazharul Islam, Alvaro Siza, Rafael Moneo, Glenn Murcutt, Ken Yeang, Juhani Pallasmaa, Wang Shu, JuhaLeiviskä, Peter Zumthor, Carlo Scarpa	
UNIT III POST-MODERN FUTURISTIC ARCHITECTURE	10
Postmodern architecture began as an international style - Continues to influence present-day architecture. Ideas and works of Architects: Cesar Pelli, Santiago Calatrava, Archigram, Louis Armet, Welton Becket, Arthur Erickson, Future Systems, John Lautner, Anthony J. Lumsden, Wayne McAllister, Oscar Niemeyer, William Pereira, Patricio Pouchulu, Eero Saarinen	
UNIT IV ANALYSIS OF ARCHITECT'S WORKS	15
Canonical architect's buildings that have exerted significant influences on the development of architecture will be studied in detail. Analysis of a building through drawings, text, bibliography and a physical model in a format ready for documentation and exhibition.	
UNIT V SEMINAR PRESENTATION	6
Student's presentation on the ideas and works of architects known for process oriented approach to architecture. Topics to be discussed with course faculty prior to presentation. Total: 45 Hours	
REFERENCES	
<ol style="list-style-type: none"> 1. Paul Allan Johnson. Theory of Architecture, Routledge 2000. 2. Kenneth Frampton. Modern Architecture since 1900. 3. Michael Hays (ed) Architectural Theory since 1960, MIT Press, 2000. 4. Bryan Lauson- How Designers Think, Architectural Press Ltd., London 1980. 5. Tom Heath- Method in Architecture, John Wiley & Sons, New York, 1984. 6. Christopher Alexander, Pattern Language, Oxford University Press. 	

YAR 202 RESEARCH METHODOLOGY

3 0 0 3

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 illustrating how good research can be used from project inception to completion- review of research publications	
Total: 45 Hours	

REFERENCES

1. Linda Groat and David Wang; Architectural Research Methods;15
2. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; The Craft of Research, 2nd Edition; Chicago guides to writing, editing and publishing;
3. Iain Borden and KaaterinaRuedi; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2000
4. Ranjith Kumar; Research Methodology- A step by step guide for beginners; Sage Publications; 2005
5. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2002
6. Amos Rapoport; House, form and culture;
7. Christopher Alexander; Pattern Language
8. Diagram Diaries; Peter Eissenman;

YAR 203A ADVANCED MATERIALS AND CONSTRUCTION TECHNOLOGY

3 0 0 3

UNIT I – MODERN MATERIALS

6

Dry wall construction, Special Use of waste products (fly ash, micro silica) and industrial by-products in concrete making- Self compacting concrete - reinforced polymers – Geo-textiles and geo-synthetics – nano materials.

UNIT II – MODERN CONSTRUCTION METHODS

12

Tall buildings structural systems – Rigid frames – Braced frames – Shear wall – Buildings – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Types – single, double & multilayered grids – two way & three way space grids, connectors, Grids – Domes - various forms. Examples of tensile membrane structures – types of pneumatic structures. Biomimetics - Definition, Replicating natural manufacturing methods as in the production of chemical compounds by plants and animals; Mimicking mechanisms found in nature, Imitating organizational principles from social behavior of organisms; Examples: Spider-silk as a substitute for steel, Lotus effect in self-cleansing glass, Dinosaur spine in bridge design, Lily pad structure, termite mound cooling system, swarm theory, aerodynamic structures etc.

UNIT III – PREFABRICATION AND CONSTRUCTION TECHNIQUES

12

Modular co-ordination, standardization and tolerances-system of prefabrication. Pre-cast concrete manufacturing techniques, Moulds –construction design, maintenance and repair. Pre-casting techniques - Planning, analysis and design considerations - Handling techniques -Transportation Storage and erection of structures. Joints -Curing techniques including accelerated curing such as steam curing, hot air blowing etc., -Test on precast elements - skeletal and large panel constructions - Industrial structures. Pre-cast and pre-fabricating technology for low cost and mass housing schemes.Small pre-cast products like door frames, shutters, Ferro-cement in housing - Water tank service core unit.Quality control - Repairs and economical aspects on prefabrication.

UNIT IV – DEMOLITION

6

Advanced techniques and sequence in demolition and dismantling

UNIT V – SAFETY PRACTICES IN CONSTRUCTION

9

Construction accidents - Construction Safety Management: - Environmental issues in construction - occupational and safety hazard assessment. Safety Programmes - Job-site assessment - Safety in hand tools- Safety in grinding- Hoisting apparatus and conveyors- Safety in the use of mobile cranes-Manual handling- Asbestos cement roofs-Safety in demolition work- Trusses, girders and beams- First- aid- Fire hazards and preventing methods-Interesting experiences at the construction site against the fire accidents - earthquake resistant design of buildings.

Total: 45 Hours

REFERENCES

1. Richard J. Coble, Jimmie Hinze and Theo C. Haupt, Construction Safety and Health Management, Prentice Hall Inc., 2001.
2. Hand Book on Construction Safety Practices, SP 70, BIS 2001.
3. N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.
4. John Fernandez, Material Architecture, Architectural Press, UK.
5. Rodney Howes, Infrastructure for the built environment, Butterworth Heineman
6. Peurifoy, R.L., Ledbette. W.B., Construction Planning, Equipment and Methods, McGraw Hill Co., 2000.
7. Jimmy W. Hinze, Construction Safety, Prentice Hall Inc., 1997

YAR 203B ARCHITECTURE AND CRITICAL THEORY**3 0 0 3****UNIT I - INTRODUCTION****6**

Architectural Theory and practice- Relation between theory and practice.Traditions in/of architectural theory.CriticalTheory.Qualities and challenges of critical theory.

UNIT II POWER AND BUILT ENVIRONMENT**10**

Forms of power.Power and knowledge.Panopticon.Colonialism as a form of dominance.Colonialism in India.Production of Indo-Saracen architecture.Ideas of segregation, control and surveillance in colonial towns.Discussing New Delhi as a part of imperial vision.Idea of Ghetto, surveillance and control in contemporary cities.

UNIT III ENCOUNTERING MODERNISM/MODERNITY**10**

Phenomenology and architecture.Architecture and sense of place.Fragmentation and Nihilism as conditions of modern society. Counter claims. Encountering the idea of functionalism - Semiotic and Deconstruction as a critical tool. Architecture of Resistance.The idea of critical regionalism.

UNIT IV SPECTACLE AND ARCHITECTURE**10**

Society of spectacle.Spectacle as a form of seduction.**Debating Aestheticization** of architectural issues.Critiquing learning from Las Vegas.World in a shopping wall.Thematic Environments.Theme parks and privatization of public spaces.Visual regime in architecture.Media and architecture.

UNIT V ISSUES IN ARCHITECTURE**9**

Gender and space.Heritage and politics of memory.City as contested geography.Technology and Architecture.

Total:**45 Hours****REFERENCES**

1. Neil Leach (ed) Rethinking Architecture, Routledge 2000
2. Paul Allan Johnson. Theory of Architecture, Routledge 2000
3. Michael Hays (ed) Architectural Theory since 1960,MIT Press, 2000
4. Anthony king, Urban Development in Colonialism
5. Nazzar Al Sayaad (ed) Forms of Dominance,
6. Lawrence vale. Architecture and Nationalism and identity,
7. Anil Lomba, Colonialism, 2000
8. Thomas Metcalf Imperial vision, Oxford
9. Neil Leach, Aesthetics and Anesthetics,
10. Guy Debord. Society of Spectacle.

YAR 204 DIGITAL DESIGN PROCESS IN ARCHITECTURE**2 2 0 3**

Unit –I INTRODUCTION 10 Contemporary theories in Digital Architecture Evolution of Digital Architecture – Driving forces behind Digital Architecture – Digital Output and its process.
Unit – II SOLIDS, SURFACES & VIRTUAL MEDIA 10 Works of Zvihecker – Shape Grammar – Hyper Surfaces – Interactive Architecture – Virtual Architecture .
Unit- III Genetic Algorithms: 20 Fractal theory – Veronoi patterns – Cellular Automata-Linden Mayor systems – Basic Concepts and its application
Unit – IV IDEAS AND WORKS OF CONTEMPORARY ARCHITECTS 10 Greg Lynn, Reiser + Umemotto , Lars spuybroek/NOX Architects, UN Studio, Diller Scofidio, Dominique Perrault, Aranda Lasch, Herzog and De Meuron, Neil Denari, Michael Hasmeyer.
Unit – V BIOMIMICS 10 Concept of Biomimics - Biomimicry and its application – Project based on Biomimics – Evolution of Biomimics in Architecture – <i>Design Assignment based on Biomimics (either Digital or Manual) Lab Classes in Scripting and Rhino + Grasshopper.</i>
REFERENCES: <ol style="list-style-type: none"> 1. Animate from – Greg Lyres 2. Chaos making of new science – James Gleick 3. The self made taps by: Patters formed in Nature - Philip Ball. 4. Finding forms :Tours of an Architecture of the Minimal – Frei Otto and Bodo Rasch. 5. Godel, Escher and Bach : An external Golden Braid – Douglas R.Hofstadter. 6. Emergence Staner Johnson 7. The Autopoiesis of Architecture – Patrick Schumacher.

Total: 60 Hours

YAR205 BUILDING MANAGEMENT SYSTEMS

2 2 0 3

UNIT – I INTRODUCTION 10 Introduction to Basics of Building Management Systems (BMS), Integrated Building Management Systems (IBMS) and Building Automation System (BAS). Scope and Importance of Building Management Systems. Introduction to Facilities Management (FM) Building Information Modeling (BIM), Management Information systems (MIS). Introduction to Maintenance systems - Predictive Maintenance (PdM) , Corrective Maintenance.
UNIT- II ASPECTS OF BUILDING MANAGEMENT SYSTEM 10 HVAC management –Central plant optimization (CPO) , Chillers, Cooling towers, VAV, AHU, Exhaust systems, Lighting management, Electrical systems management, Plumbing and Fire fighting systems management. Safety and Security systems management – Alarm systems, Access control systems, Closed circuit television, Intruder Alarm, Perimeter protection, Safety systems
UNIT - III CONTROL SYSTEMS, PROTOCOLS AND SERVICE INTEGRATION 16 Controllers-Types and functions, Pneumatic control systems, electric control systems. Computerized control systems, Direct digital control, Sensors and Actuators-Types and functions. Occupancy, Integration using Internet protocol. Open protocols Vs Proprietary systems, Bacnet Vs Lonmark, Fully Integrated system Vs Standalone operations. Integration of services – water pump monitoring & control - Control of Computerized HVAC Systems –Direct Digital Control - chillers, pumps, BTU monitoring & control – IBMS system and its components – centralized control equipments – sub- station and field controllers – field sensors.
UNIT – IV TRENDS IN BUILDING MANAGEMENT SYSTEM 12 Energy Management and Control Systems (EMCS), Management Information systems (MIS) Building Energy Management systems (BEMS), BMS retrofitting, BMS towards sustainability and green practices. Intelligent buildings, Role of BMS in energy efficiency and maintenance cost. <i>Case study</i> , examples.

UNIT – V INTELLIGENT MANAGEMENT SYSTEMS AT URBAN LEVEL**12**

BMS Future cities, Intelligent/Smart cities, Smart grids, Demand driven distribution, District cooling and Heating, Wireless Building Technology, Intelligent wireless street lighting system, Intelligent Traffic Management systems, Intelligent guidance systems.

Total: 60 Hours**REFERENCES**

1. Smart Buildings Systems for Architects, Owners and Builders -By James M Sinopoli.
2. Intelligent Buildings and Building Automation - By Shengwei Wang.
3. Introduction to Building Management - By D. Coles, G. Bailey, R E Calvert.
4. Building Energy Management Systems: Application to Low-Energy Hvac and Natural Ventilation Control- By G. J. Levermore.
5. Smart grid home- By Quentin Wells

YAR 206 ARCHITECTURAL DESIGN STUDIO – II**0 0 16 8**

Large scale projects such as campus design, airport, civic centre, urban recreational centers, mixed use high rise development. Application of building management system, services details are to be incorporated in the [detailed design drawings](#) **Total :240 Hours**

YAR 301 SUSTAINABLE LANDSCAPE DESIGN**3 0 0 3****UNIT I - ECOLOGY AND LANDSCAPE****6**

Concept of Ecosystem: General Structure and Function - Energy flow, Primary & Secondary Production - Types of Biogeochemical cycles; Carbon cycle, Global water cycles, nitrogen cycle bioaccumulation and biomagnifications and - Analysis and evaluation. Concept of ecosystem services.- Types of Ecosystems Environmental Impact Assessment and the Environmental Impact Statement: Theory and Practice. [Illustrative examples](#) from India to demonstrate the degree of effectiveness. The role of Environmental Legislation and the Ministry of Environment and Forests.

UNIT II - PLANTS AND DESIGN**10**

Basic plant structure/morphology/anatomy - Basic plant functions/growth & development / physiology - Principles of taxonomy / classification, identification and naming Familiarity with local flora. Ecological and Botanical considerations in landscape design. Plant data sheet. Planting as a design element for structuring the landscape. Structural and visual characteristics of plants. Principles of visual composition. Plant association. The role of plant material in environmental improvement, (e.g. soil conservation, modification of microclimate).

UNIT III - CULTURAL AND HISTORIC LANDSCAPE**10**

Early traditions and beliefs about landscape and environment in east. Ancient Indian traditions – Vedic, Jainism, Buddhism and later Hindu movements. Symbolic meanings and sacred value of natural landscapes. Transfer of concepts through Buddhism to China – Chinese landscape development – gardens of China – Pre Buddhist Japanese landscapes – impact of China on Japanese gardens – Japanese gardens. Nomadic culture of central Asia – advent of Islam – concept of Paradise as a garden – spread of Islamic traditions to the West and East. Eastern expression of Islam – Samarkhand and Mughal India – Tomb and pleasure garden – Mughal concepts of site planning. Western expression of Islam – Spain Alhambra and Generalife, Granada.

UNIT IV- CONTEMPORARY LANDSCAPE**10**

Industrialization and urbanization – impacts and development of the concept of public open spaces, open space development in new towns, parks movement. Study of selected works of modern landscape architects. Frederick Law Olmsted, *Martha Schwartz*, *Burle Marx*, *Ravindra Bhan* and other pioneers.

UNIT V- CASE STUDY**9**

Issues in contemporary India, Analysis and understanding of philosophies of Contemporary landscape works in India, [case studies](#).

Total: 45 Hours

REFERENCES

1. Geoffrey and Susan Jellicoe, The landscape of Man, Thames & Hudson Publication, 1995
2. Robert Holden, New landscape Design, Lawrence king publishing, UK, 2003
3. Penelope Hill, Contemporary history of garden design, Birkhauser publishers, 2004
4. Elizabeth Barlow Rogers, Landscape Design – A Cultural & Architectural History, Hary& Abram inc. publishers, 2001.
5. Phillip Pregill& Nancy Volkman, Landscapes in History, Van Nostrand publishers, 1993.
6. Jonas Lehrman, Earthly Paradise- Garden and courtyard in Islam, Thames and Hudson, 1980.
7. G.B.Tobey, A history of American Landscape architecture, American Elsevier Publishing Co., NY, 1973.
8. Pieluigi Nicholin, Francesco Repishti, Dictionary of today's landscape design, Skira Editores P.A, 2003.

YAR 302 HERITAGE CONSERVATION PLANNING**3 0 0 3****UNIT – I INTRODUCTION TO ARCHITECTURAL CONSERVATION****6**

Introduction to architectural conservation of heritage buildings, environmental conservation, purpose & scope of conservation projects in Indian context – Role of architect in such programmes, values & ethics of conservation programme- involvement of community & social organisations – public participation – conflict and compatibility between conservation and development.

UNIT – II PROCEDURE FOR CONSERVATION**10**

Procedure for listing of structures for conservation. Inventories, inspection, documentation, degree of intervention for prevention of deterioration, prevention of existing state, consolidation of the fabric, restoration, rehabilitation, reproduction, reconstruction, etc. – to study the structural elements of buildings such as beams, arches, and domes, walls, piers & columns, foundation etc, causes of decay in buildings by natural and human factors, The role of conservation architect & his team.

UNIT – III STRUCTURAL CONSERVATION**10**

Behavioral properties of traditional construction materials- various methods and techniques involved in structural conservation, case studies and examples.

UNIT – IV LEGISLATION AND INSTITUTIONS**11**

Special legislation – Central and State. New concepts and emerging trends in conservation. Methods and procedures adopted by agencies such as UNDP, UNESCO, ICOMOS, ICCROM, ASI, INTACH

UNIT- V CASE STUDIES**8**

Case studies of conservation projects in Indian and International context. Appraisal of conservation project in view of the above issues- success & failure – reasons for it. **Total: 45 Hours**

REFERENCES

1. Conservation and development in historic towns & cities – Pamela Ward Press Ltd.
2. Planning for conservation – Kain Roger – St.Martin N-Y 1981.
3. Character of towns – An approach to conservation – Worskett Roy, Arch. Press – London.
4. Guidelines for conservation by INTACH.
5. Conservation of Historic Buildings, Sir Bernard M. Felidan, - Arch Press, 1982.
6. Gerald Glenn, “Presentation & Rehabilitation” (1996), ASTM International.
7. History of Architectural conservation, (1st Pub 1999, Reprint 2005) – Butterworth, Oxford, UK.

YAR 303 URBAN DESIGN PRACTICES**3 0 0 3****UNIT I INTRODUCTION TO URBAN DESIGN THEORY****10**

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. Historic developments of streets and squares

UNIT II ELEMENTS OF URBAN DESIGN**10**

Urban form as determined by the inter-play of masses, voids, building typology, scale, harmony, symmetry, colour, texture, light & shade, dominance, height, 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 URBAN DESIGN METHODOLOGIES**10**

Methods of urban design surveys, documentation and representation. Cognitive mapping – contemporary and traditional, architectural expressions. Seminar presentation on transport planning in urban design.

UNIT - IV URBAN RENEWAL & DEVELOPMENT**8**

Historic overview of urban renewal, Development strategies for regeneration of inner city areas, recycling, renewal, etc. Case studies of urban renewal. Adaptive reuse and Brown Field projects in India and abroad. Infrastructure up gradation, economic regeneration, financing and management of urban renewal schemes. Institutional framework for urban conservation and renewal strategies in India.

UNIT V CASE STUDIES**9**

Legal & administrative aspects, policies, charters, case studies of proposals for urban design projects from India & Abroad

Total: 45 Hours**REFERENCES**

1. Jon Lang, "Urban design" – a typology of procedures & products 2005, Glsevier, North America.8
2. Gcoffrey Broadbent, "Emerging concepts in Urban Space Design-(1995), Jayker& ravel.
3. Cliff Monghtin, "UD-Street & Squace," (2003), Architectural Press.
4. Jonathan Barnett, "Designing cities without designing building", (1982), Harper & Row, New York.
5. Edmond Bacon, "Design of cities", (1976), revised edition, Viking Penguin Inc; U.S.A.

YAR 304B ENERGY SIMULATION AND MODELLING**2 -2 - 0- 3****UNIT I - INTRODUCTION TO ENERGY****10**

Definition and units of energy, power, Forms of energy, Conservation of energy, second law of thermodynamics, Energy flow diagram to the earth. Origin of fossil fuels, time scale of fossil fuels, Renewable Energy Resources, Role of energy in economic development and social transformation.

UNIT II - INTRODUCTION TO SOLAR ENERGY**10**

Solar Spectrum, Solar Time and angles, day length, angle of incidence on tilted surface; Sunpath diagram; Shadow angle protractor; Solar Radiation: Extraterrestrial Radiation; Effect of earth atmosphere; Estimation of solar radiation on horizontal and tilted surfaces; Measurement of Solar radiation, Analysis of Indian solar radiation data and applications.

UNIT III - INTRODUCTION TO ENERGY MODELING**10**

Definition of energy modeling, Answers that energy modeling provide, Building modeling tools: Daylighting/ lighting modeling, Computational fluid dynamics(CFD), Building component analysis, HVAC analysis, Building thermal analysis, Whole building energy simulation programs.

UNIT IV - INTERFACES AND SOFTWARE PACKAGES	15
Introduction to interfaces of energy modeling software packages, DOE2, ENERGY PLUS, ECOTECT, CLIMATE CONSULTANT, HEED, BERS, GREEN BUILDING STUDIO.	
UNIT - V CASE STUDY	15
Literature case study and live case study, Energy modeling of a residential building.	
Total: 60 Hours	
REFERENCES 1. Eddy Krygiel., Bradley Nies, Green BIM Wily publishing, Canada, 2008. 2. Advanced Energy Design Guide For Small Office Buildings, American Society of Heating Refrigerating and Airconditioning, USA 2004. 3. Davies, Morris Grenfell, Building Heat Transfer, Wiley, 2008. 4. Underwood, Chris, Modelling Methods For Energy In Buildings, Wiley Blackwell, 2008. 5. International Energy Conservation Code 2003, International Code Council. 6. Baker, Nick, Energy And Environment In Architecture, Taylor & Francis, 2000. 7.Dobbelsteen, Andy van den, Smart Building In A Changing Climate, Island Press, 2009.	

YAR 305 DISSERTATION

0 0 6 3

Topics related to various aspects of Architecture would be chosen in consultation with faculty members, comprehensively researched, and findings presented in a series of seminars by individual students.

The materials would be documented and formally presented as a Dissertation at the end of the semester.

Total: 90

Hours

YAR 306 ARCHITECTURAL DESIGN STUDIO –III

0 0 16 8

Large scale architectural design projects with the scope includes urban design and landscape issues. Projects such as neighborhood development, redevelopment, urban renewal projects, study documentation, analysis and proposal for inner city development, historic precinct development with the conservation and landscaping details.

Total: 240 Hours

YAR 401 THESIS

0 0 0 14

Thesis may be either THESIS BY DESIGN or THESIS BY RESEARCH

THESIS BY DESIGN

The design thesis is an independent topic explored and defined by the student in the previous semester. Students continue to take forward the thesis areas, leading to the development of a clear design proposal to be supervised by a faculty team and evaluated by an external jury. The tutorial will assist the students to strengthen the theoretical base of the thesis and analyze relevant successful **design demonstrations through case studies**.

THESIS BY RESEARCH

The thesis by research is an independent research on a topic defined by a student, to be completed in the form of a comprehensive report under the supervision of an advisor and evaluated by an external jury. The tutorial will assist the student in research methodologies, conducting of surveys, identifying case studies etc. Types of research: descriptive vs Analytical, applied vs fundamental, quantitative vs qualitative, conceptual vs empirical research Introduction to urban research, Research design methodology, Descriptive research, Explanatory research, diagnostic, experimental research.

Total: 525 Hours