ANNA UNIVERSITY, CHENNAI
UNIVERSITY DEPARTMENTS
B.ARCH.
REGULATIONS – 2015
CHOICE BASED CREDIT SYSTEM

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Bachelor of Architecture curriculum is designed to prepare the graduates having aptitude and knowledge

1. To enable a successful professional and technical career.
2. To enable a strong foundation in Humanities and Sciences, Engineering Sciences and Architectural Design Skills.
3. To impart knowledge of the theories and practices in the field of Architecture.
4. Engage in life-long learning to keep themselves abreast of new developments.
5. To put into practice and inspire high ethical values and technical standards.

PROGRAMME OUTCOME (PO):

a) Ability to gain knowledge of Humanities, Sciences and Architecture.

b) Ability to understand elements of Architecture and apply basic principles in Architectural Design.

c) Ability to identify social, economical and cultural issues in Architectural Design.

d) Ability to analyze and apply theoretical knowledge to achieve Architectural Design solutions.

e) Ability to understand ethical and professional responsibilities.

f) Ability to review, comprehend and report technological developments.

g) Ability to understand real life situation of Architectural Practice.

h) Ability to communicate effectively and work in interdisciplinary groups.

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MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

PEO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
1						√	√	√
2	√		√	√				
3		√	√	√	√			
4						√	√	√
5					√		√	√

		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR I	SEMESTER I	History of Architecture and Culture I			√					
		Mathematics	√							
		Architectural Drawing I	√							
		Art Studio	√							
		Communication English						√		
		Basic Design		√						
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR I	SEMESTER II	Building Materials I				√				
		Mechanics of Structures I	√							
		Architectural Drawing II	√							
		Building Construction I				√		√		
		Theory of Architecture		√		√				
		Architectural Design I		√						√

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		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR II	SEMESTER I	History of Architecture and Culture II				√				
		Mechanics of Structures II	√							
		Environmental Science and Engineering			√		√			
		Building Construction II	√					√	√	
		Climate and Built Environment		√						
		Architectural Design II		√						√
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR II	SEMESTER II	Building Materials II	√			√				
		Evolution of Human Settlements	√		√					
		Building Construction III	√						√	
		Building Services I						√	√	
		Computer Aided Visualization	√							
		Architectural Design III		√						√

		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR III	SEMESTER I	Design of Structures I	√							
		History of Architecture and Culture III			√					
		Professional Elective I								
		Building Construction IV	√					√	√	
		Building Services II	√			√				
		Architectural Design IV		√						√
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR III	SEMESTER II	Design of Structures II	√							
		Site Planning and Development	√	√	√	√				
		Specification, Estimation and Budgeting	√					√	√	
		Professional Elective II								
		Architectural Design Detailing	√					√	√	
		Architectural Design V		√						√

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		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR IV	SEMESTER I	Professional Practice and Ethics					√		√	
		Urban Design	√		√		√		√	√
		Professional Elective III								
		*Open Elective I								
		Building Services III	√			√				
		Architectural Design VI		√	√					√
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR IV	SEMESTER II	Practical Training	√	√	√				√	√

		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR V	SEMESTER I	Human Settlements Planning	√		√					
		Landscape Design	√							
		Urban Housing			√	√				
		Professional Elective IV								
		*Open Elective II								
		Architectural Design VII		√	√	√			√	√
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR V	SEMESTER II	Professional Elective V								
		Thesis		√	√	√	√		√	

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CURRICULA AND SYLLABI I - X SEMESTERS

I SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	AR7101	History of Architecture and Culture I	HS	3	3	0	0	3
2.	AR7102	Mathematics	BS	4	2	2	0	3
THEORY CUM STUDIO								
3.	AR7111	Architectural Drawing I	ES	5	1	0	4	3
4.	AR7112	Art Studio	HS	5	1	0	4	3
5.	AR7113	Communication English	EEC	4	2	0	2	3
STUDIO								
6.	AR7114	Basic Design	PC	12	0	0	12	6
			TOTAL	**33**	**9**	**2**	**22**	**21**

II SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	AR7201	Building Materials I	ES	3	3	0	0	3
2.	AR7202	Mechanics of Structures I	ES	4	2	2	0	3
THEORY CUM STUDIO								
3.	AR7211	Architectural Drawing II	ES	5	1	0	4	3
4.	AR7212	Building Construction I	PC	5	1	0	4	3
5.	AR7213	Theory of Architecture	PC	4	2	0	2	3
STUDIO								
6.	AR7214	Architectural Design I	PC	12	0	0	12	6
			TOTAL	**33**	**9**	**2**	**22**	**21**

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III SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									
1.	AR7301	History of Architecture and Culture II	HS	3	3	0	0	3	A pass is required in Basic Design (Sem I)
2.	AR7302	Mechanics of Structures II	ES	4	2	2	0	3	
3.	GE7251	Environmental Science and Engineering	BS	3	3	0	0	3	
THEORY CUM STUDIO									
4.	AR7311	Building Construction II	PC	5	1	0	4	3	
5.	AR7312	Climate and Built Environment	BS	4	2	0	2	3	
STUDIO									
6.	AR7313	Architectural Design II	PC	14	0	0	14	7	
			TOTAL	**33**	**11**	**2**	**20**	**22**	

IV SEMESTER

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									A pass is required in Architectural Design I (Sem II)
1.	AR7401	Building Materials II	ES	3	3	0	0	3	
2.	AR7402	Evolution of Human Settlements	HS	3	3	0	0	3	
THEORY CUM STUDIO									
3.	AR7411	Building Construction III	PC	5	1	0	4	3	
4.	AR7412	Building Services I	ES	4	2	0	2	3	
5.	AR7413	Computer Aided Visualization	EEC	5	1	0	4	3	
STUDIO									
6.	AR7414	Architectural Design III	PC	14	0	0	14	7	
			TOTAL	**34**	**10**	**0**	**24**	**22**	

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V SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									A pass is required in Architectural Design II (Sem III)
1.	AR7501	Design of Structures I	ES	4	2	2	0	3	
2.	AR7502	History of Architecture and Culture III	HS	3	3	0	0	3	
3.		Professional Elective I	PE	3	3	0	0	3	
THEORY CUM STUDIO									
4.	AR7511	Building Construction IV	PC	5	1	0	4	3	
5.	AR7512	Building Services II	ES	4	2	0	2	3	
STUDIO									
6.	AR7513	Architectural Design IV	PC	14	0	0	14	7	
			TOTAL	**33**	**11**	**2**	**20**	**22**	

VI SEMESTER

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									A pass is required in Architectural Design III (Sem IV)
1.	AR7601	Design of Structures II	ES	4	2	2	0	3	
2.	AR7602	Site Planning and Development	PC	3	3	0	0	3	
3.	AR7603	Specification, Estimation and Budgeting	ES	3	3	0	0	3	
4.		Professional Elective II	PE	3	3	0	0	3	
THEORY CUM STUDIO									
5.	AR7611	Architectural Design Detailing	PC	5	1	0	4	3	
STUDIO									
6.	AR7612	Architectural Design V	PC	16	0	0	16	8	
			TOTAL	**34**	**12**	**2**	**20**	**23**	

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VII SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									A pass is required in Architectural Design IV (Sem V)
1.	AR7701	Professional Practice and Ethics	PC	3	3	0	0	3	
2.	AR7702	Urban Design	PC	3	3	0	0	3	
3.		Professional Elective III	PE	3	3	0	0	3	
4.		*Open Elective I	OE	3	3	0	0	3	
THEORY CUM STUDIO									
5.	AR7711	Building Services III	ES	4	2	0	2	3	
STUDIO									
6.	AR7712	Architectural Design VI	PC	16	0	0	16	8	
			TOTAL	**32**	**14**	**0**	**18**	**23**	

VIII SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
									A pass is required in Architectural Design V (Sem VI)
1.	AR7811	Practical Training	EEC	0	0	0	0	12	
			TOTAL	**0**	**0**	**0**	**0**	**12**	

IX SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
THEORY									A pass is required in Architectural Design VI (Sem VII)
1.	AR7901	Human Settlements Planning	PC	3	3	0	0	3	
2.	AR7902	Landscape Design	PC	3	3	0	0	3	
3.	AR7903	Urban Housing	HS	3	3	0	0	3	
4.		Professional Elective IV	PE	3	3	0	0	3	
5.		*Open Elective II	OE	3	3	0	0	3	
STUDIO									
6.	AR7911	Architectural Design VII	PC	16	0	0	16	8	
			TOTAL	**31**	**15**	**0**	**16**	**23**	

X SEMESTER

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.		Professional Elective V	PE	3	3	0	0	3
2.	AR7091	Thesis	EEC	36	0	0	36	18
			TOTAL	**39**	**3**	**0**	**36**	**21**

TOTAL NO. OF CREDITS: 210

***Course from the curriculum of other UG Programmes**

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HUMANITIES AND SOCIAL SCIENCES (HS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7101	History of Architecture and Culture I	HS	3	3	0	0	3
2.	AR7112	Art Studio	HS	5	1	0	4	3
3.	AR7301	History of Architecture and Culture II	HS	3	3	0	0	3
4.	AR7402	Evolution of Human Settlements	HS	3	3	0	0	3
5.	AR7502	History of Architecture and Culture III	HS	3	3	0	0	3
6.	AR7903	Urban Housing	HS	3	3	0	0	3

BASIC SCIENCES (BS)

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7102	Mathematics	BS	4	2	2	0	3
2.	AR7312	Climate and Built Environment	BS	4	2	0	2	3
3.	*GE7251	Environmental Science and Engineering	BS	3	3	0	0	3
*GE-General								

ENGINEERING SCIENCES (ES)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7111	Architectural Drawing I	ES	5	1	0	4	3
2.	AR7201	Building Materials I	ES	3	3	0	0	3
3.	AR7202	Mechanics of Structures I	ES	4	2	2	0	3
4.	AR7211	Architectural Drawing II	ES	5	1	0	4	3
5.	AR7302	Mechanics of Structures II	ES	4	2	2	0	3
6.	AR7401	Building Materials II	ES	3	3	0	0	3
7.	AR7412	Building Service I	ES	4	2	0	2	3
8.	AR7501	Design of Structures I	ES	4	2	2	0	3
9.	AR7512	Building Services II	ES	4	2	0	2	3
10.	AR7601	Design of Structures II	ES	4	2	2	0	3
11.	AR7603	Specification Estimation and Budgeting	ES	3	3	0	0	3
12.	AR7711	Building Services III	ES	4	2	0	2	3

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PROFESSIONAL CORE (PC)

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7114	Basic Design	PC	12	0	0	12	6
2.	AR7212	Building Construction I	PC	5	1	0	4	3
3.	AR7213	Theory of Architecture	PC	4	2	0	2	3
4.	AR7214	Architectural Design I	PC	12	0	0	12	6
5.	AR7311	Building Construction II	PC	5	1	0	4	3
6.	AR7313	Architectural Design II	PC	14	0	0	14	7
7.	AR7411	Building Construction III	PC	5	1	0	4	3
8.	AR7414	Architectural Design III	PC	14	0	0	14	7
9.	AR7511	Building Construction IV	PC	5	1	0	4	3
10.	AR7513	Architectural Design IV	PC	14	0	0	14	7
11.	AR7602	Site Planning and Development	PC	3	3	0	0	3
12.	AR7611	Architectural Design Detailing	PC	5	1	0	4	3
13.	AR7612	Architectural Design V	PC	16	0	0	16	8
14.	AR7701	Professional Practice and Ethics	PC	3	3	0	0	3
15.	AR7702	Urban Design	PC	3	3	0	0	3
16.	AR7712	Architectural Design VI	PC	16	0	0	16	8
17.	AR7901	Human Settlements Planning	PC	3	3	0	0	3
18.	AR7902	Landscape Design	PC	3	3	0	0	3
19.	AR7911	Architectural Design VII	PC	16	0	0	16	8

PROFESSIONAL ELECTIVES (PE)

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7001	Advanced Structures	PE	3	3	0	0	3
2.	AR7002	Architectural Conservation	PE	3	3	0	0	3
3.	AR7003	Architectural Journalism	PE	3	3	0	0	3
4.	AR7004	Art Appreciation	PE	3	3	0	0	3
5.	AR7005	Building Information Modeling	PE	6	0	0	6	3
6.	AR7006	Construction and Project Management	PE	3	3	0	0	3
7.	AR7007	Construction Technology	PE	3	3	0	0	3
8.	AR7008	Contemporary Building Materials	PE	3	3	0	0	3
9.	AR7009	Contemporary Process in Architectural Design	PE	3	3	0	0	3
10.	AR7010	Digital Art	PE	5	1	0	4	3
11.	AR7011	Dissertation	PE	6	0	0	6	3
12.	AR7012	Earthquake Resistant Architecture	PE	3	3	0	0	3
13.	AR7013	Energy Efficient Architecture	PE	3	3	0	0	3
14.	AR7014	Entrepreneurship skills for Architects	PE	3	3	0	0	3
15.	AR7015	Glass Architecture and Design	PE	4	2	2	0	3
16.	AR7016	Graphic and Product Design	PE	5	1	0	4	3
17.	AR7017	History of Contemporary Architecture	PE	3	3	0	0	3

18.	AR7018	Interior Design	PE	3	3	0	0	3
19.	AR7019	Real Estate Development	PE	3	3	0	0	3
20.	AR7020	Steel Architecture and Design	PE	3	3	0	0	3
21.	AR7021	Structure and Architecture	PE	3	3	0	0	3
22.	AR7022	Sustainable Architecture and Planning	PE	3	3	0	0	3
23.	AR7023	Theory of Design	PE	3	3	0	0	3
24.	AR7024	Understanding Madras - Chennai City	PE	3	3	0	0	3
25.	AR7025	Vernacular Architecture	PE	3	3	0	0	3
26.	*GE7071	Disaster Management*	PE	3	3	0	0	3
27.	*GE7074	Human Rights*	PE	3	3	0	0	3
*GE-General								

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.	AR7113	Communication English	EEC	4	2	0	2	3
2.	AR7413	Computer Aided Visualization	EEC	5	1	0	4	3
3.	AR7811	Practical Training	EEC	0	0	0	0	12
4.	AR7091	Thesis	EEC	36	0	0	36	18

SUMMARY

SL. NO.	SUBJECT AREA	CREDITS PER SEMESTER										CREDITS TOTAL
		I	II	III	IV	V	VI	VII	VIII	IX	X	
1	**HS**	6		3	3	3				3		18
2	**BS**	3		6								9
3	**ES**	3	9	3	6	6	6	3				36
4	**PC**	6	12	10	10	10	14	14		14		90
5	**PE**					3	3	3		3	3	15
6	**OE**							3		3		6
7	**EEC**	3			3				12		18	36
	Total	**21**	**21**	**22**	**22**	**22**	**23**	**23**	**12**	**23**	**21**	**210**
	Non-Credit/ Mandatory	NCC/NSS/ YRC/ Rotaract		Rural study tour		All India Tour						

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AR7101 HISTORY OF ARCHITECTURE AND CULTURE I

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To inform about the development of architecture in the Ancient Western World and the cultural and contextual determinants that produced that architecture.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate.
- To gain knowledge of the development of architectural form with reference to Technology, Style and Character in the prehistoric world, Ancient Egypt, West Asia, Greece , Rome, Medieval times and Renaissance period.

UNIT I WISDOM OF THE ANCIENTS THRO RIVER VALLEY CIVILIZATION 07

Response to culture and context in building shelter in the Neolithic period- R. Nile and the architecture of Egypt with relevant examples – Urban form in the Indus Valley and the Tigris and Euphrates basin and relevant examples of architecture.

UNIT II CLASSICAL WORLD 10

Landscape and culture of Greece –Greek character – Greek polis and democracy – Domestic architecture– Evolution of the Greek temple and the building of the Acropolis –Public architecture: Theatre and Agora- optical illusions in architecture- City Planning.

Roman history: Republic and Empire –Religion, culture, lifestyle - Roman character – Roman urban planning –architecture as imperial propaganda: forums and basilicas – structural forms: materials and techniques of construction spanning large spaces with relevant examples - domestic architecture.

UNIT III EARLY CHRISTIANITY AND CHRISTIAN KINGDOMS 10

Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial. Church planning – Basilica concept and Centralized plan concept with relevant examples in the West and in the Byzantine.

The Carolingian Renaissance – Feudalism and rural manorial life – Papacy – Monasticism – Craft and merchant guilds. Medieval domestic architecture – Romanesque churches with relevant examples in Europe – Development of vaulting.

UNIT IV THE AGE OF CHURCH BUILDING 08

Development of Gothic architecture Church plan, structural developments in France and England with using relevant examples of church architecture in Europe – wooden roofed churches.

UNIT V IDEA OF RE-BIRTH AND RENAISSANCE IN EUROPE 10

Idea of rebirth and revival – Humanism –Development of thought – Reformation- the Renaissance patron – Urbanism Renaissance architecture: Brunelleschi and rationally ordered space – ideal form and the centrally planned church using relevant examples– palace and villa architecture with relevant examples – Mannerist architecture- The Renaissance in transition – works of Michelangelo; Sir Christopher Wren, Andrea Palladio, Inigo Jones- Baroque and palace building in France.

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding about the spatial and stylistic qualities associated with architecture.
- An Understanding of architecture as an outcome of various social, political and economic upheavals, and as a response to the cultural and context.

TEXTBOOKS:

1. Sir Banister Fletcher, A History of Architecture, CBS Publications (Indian Edition), 1999.
2. Spiro Kostof – A History of Architecture – Setting and Rituals, Oxford University Press, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994.

REFERENCES:

1. Pier Luigi 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. Gosta, E. Samdstrom, Man the Builder, McGraw Hill Book Company, New York, 1970.
4. Webb and Schaeffer; Western Civilization Volume I; VNR: NY: 1962.
5. Vincent Scully: Architecture; Architecture – The Natural and the Man Made : Harper Collins Pub: 1991.
6. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994.

AR7102	MATHEMATICS	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- Identifying practical problems to obtain solutions involving trigonometric and exponential functions.
- Studying the properties of lines and planes in space, along with sphere and providing a tool too.
- Understand 3D material.
- Understand functions of more than one variable, along with differentiation under integral sign.
- Solving differential equation of certain type.
- Analyzing data collection and interpretation of results using statistical tools.

UNIT I TRIGONOMETRY AND MENSURATION 12

Trigonometric (sine, cosine and tan functions) and exponential functions, De-Moiver's theorem. Area of plane figures, computation of volume of solid figures.

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY 12

Direction cosines and ratio's – Angle between two lines – Equations of a plane – Equations of a straight line – Coplanar lines – Shortest distance between skew lines – Sphere – Tangent plane – Plane section of a sphere.

UNIT III INTEGRATION AND FUNCTIONS OF TWO VARIABLES 12

Integration of rational, trigonometric and irrational functions, properties of definite integrals, Reductions formulae for trigonometric functions, Taylor's Theorem - Maxima and Minima (Simple Problems).

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 12

Linear equations of second order with constant coefficients – Simultaneous first order linear equations with constant coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form.

UNIT V BASIC STATISTICS AND PROBABILITY 12

The arithmetic mean, median, mode, standard deviation and variance - Regression and correlation - Elementary probability - Laws of addition and multiplication of probabilities - Conditional probability – Independent events.

TOTAL: 60 PERIODS

OUTCOMES:

- The aim of the course is to develop the skills of the students in architecture. The students will be trained on the basis of the topics of Mathematics necessary for effective understanding of architecture subjects. At the end of the course, the students would have an understanding of the appropriate role of the mathematical concepts learnt.

TEXTBOOKS:

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition, 2011.

REFERENCES:

1. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
3. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
4. Gupta S.C and Kapoor V.K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 9th Edition,1996.

AR7111	ARCHITECTURAL DRAWING I	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To introduce the concepts and fundamentals of architectural drawing, to develop representation skills and to nurture the understanding of the nature of geometrical forms and simple building forms and to teach the language of architectural and building representation in two- and three dimensions.
- To introduce the basics of measured drawing.

UNIT I GEOMETRICAL DRAWING: INTRODUCTION TO DRAFTING 20

Introduction to fundamentals of drawing/ drafting: Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, use of scales etc.
Construction of lines and angles, construction of triangles, circles, tangents, curves and conic sections.

UNIT II GEOMETRICAL DRAWING: PLANE GEOMETRY 15

Construction and development of planar surface – square, rectangle, polygon etc.
Introduction of multi- view projection – projection of points, lines and planes.

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY 15

Multi- view projection of solids – cube, prism, pyramids, cones, cylinders etc. Sections of solids, true shape of solids.

UNIT IV GEOMETRICAL DRAWING: AXONOMETRIC PROJECTION 10

Isometric and axonometric projections, plan oblique and elevation oblique projection of planes, solids and combination of solid etc.

UNIT V MEASURED DRAWING 15

Introduction to fundamentals of measured drawing, line value, lettering, drawing representation, format for presentation methods and technique of measuring buildings and their details. Measured drawing of simple objects like furniture, ornamentation, measured drawing of building components like column, door, window, cornice, etc. isometric projections of simple construction details of the building components.

TOTAL: 75 PERIODS

OUTCOMES:

- Understanding on the concepts of architectural drawing as well as representation skills is imparted.
- Understanding on the building representation in 2D and 3D among students in addition to Preparation of measured drawing.

TEXTBOOKS:

1. Morris IH., "Geometrical Drawing for Art Students", Orient Longman, Madras, 2004.
2. Francis D. K. Ching, "Architectural Graphics", John Wiley and Sons, 2009.
3. Fraser Reekie, Reekie's, "Architectural Drawing", Edward Arnold, 1995.

REFERENCES:

1. Leslie Martin C.,"Architectural Graphics", The Macmillan Company, New York, 1978.

AR7112	ART STUDIO	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To develop presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials.
- To familiarize the students with the various mediums and techniques of art through which artistic expression can be achieved.
- To familiarize students with the grammar of art by involving them in a series of free hand exercises both indoor and outdoor to understand form, proportion, scale, etc.
- To involve students in a series of exercises which look at graphic and abstract representations of art.
- Involving them in a series of exercises which will help them experiment with form and volume.

UNIT I DRAWING 25

Introduction to art – Elements and principles of drawing – Types of drawing – Visual effects of drawing – Scale drawing – Composition – Approach to sketching – Study of light, shade and shadow.

Exercise involving Indoor and outdoor sketching – Spot sketching - Drawing from imagination – Study of 3 D effects through light and shade from nature – Tools and materials – Illustration – Study of human being and mobiles.

UNIT II PAINTING I 15

Introduction of painting – Colour – Properties of colour – Colour schemes – Types of colours - Application and visual effects of colour. Exercise involving Study of colour – Properties of paper, brush and other tools – Basic washes – 3D effects from still-life, nature and built environment using mono chromatic and multi colour.

UNIT III PAINTING II 15

Indoor and out door painting – Rendering techniques Exercise involving Water colour – Water soluble colour pencil – Tempra – Acrylic – Water soluble oil colour – Oil colour – Pen and ink – Brush – Air brush – Mixed mediums – Study of multi colour and 3D effects from nature and built environment.

UNIT IV SCULPTURE 10

Introduction of sculpture –Sculpture using various materials such as clay, plaster of Paris, paper mache, and wire.

UNIT V APPLIED ART 10

Graphic representations – Visual composition and Abstraction- Exercises involving Logo design, collage, calligraphy and printing.

TOTAL: 75 PERIODS

OUTCOMES:

- The skill and knowledge gained through the subject is most useful to their profession.
- The students are mastery in sketching and expression through forms.
- Bold enough to handle to the colours for the presentation sheets.
- The students are exposed to various mediums and techniques.

TEXTBOOKS:

1. Webb, Frank, "The Artist guide to Composition", David & Charles, U.K., 1994.
2. Drawing a Creative Process", Ching Francis, Van Nostrand Reinhold, New York, 1990.
3. Alan Swann, Graphic Design School, Harper Collins, 1991.

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REFERENCES:

1. Moivahuntly, “The artist drawing book”, David & Charles, U.K., 1994.
2. Arundell (Jan) Exploring sculpture, Mills and Boon, London/Charles, T. Brand Ford Company, U.S.A. 1971.
3. The art of drawing trees, heads, colours, mixing, drawing, landscape and painting, water colour, oil colour, etc. – The Grumbacher Library Books, New York –1996.
4. Caldwell Peter, “Pen and Ink Sketching”, B.T. Bats ford Ltd., London, 1995.

AR7113	COMMUNICATION ENGLISH	L	T	P/S	C
		2	0	2	3

OBJECTIVES: The English Language Course for students of architecture would,

- Enhance their communication skills in English by developing their listening, speaking, reading and writing skills.
- Develop their speaking skills with specific reference to prospective/actual clients, suppliers, business partners and colleagues.
- Enhance their reading particularly, rules and regulations, catalogues, architecture journals and textbooks.
- Develop their writing skills especially writing emails, proposals and reports.

UNIT I INTRODUCTION 10

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 10

Listening –listen to talks for specific information- Speaking- 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 10

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 15

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 15

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

TOTAL: 60 PERIODS

OUTCOMES:

- Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
- Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation.
- Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
- Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.

TEXTBOOKS:

1. English for Architects and civil Engineers - Sharon Hendenreich Springer, 2014 ISBN 978-3-658-030-63- (e-book).
2. www.cambridgescholars.com
3. www.robertdwatkins.com/Englishworkbook.pdf
4. arkenglish.

REFERENCES:

1. Chris Mounsey: **Essays and Dissertation** (Oxford University Press) February 2005.
2. Sidney Greenbaum: **The Oxford English Grammar** (Oxford University Press) March 2005.
3. Krishna Mohan and Meera Banerji: **Developing Communication Skills** (Mac Millan india Ltd)[2000].
4. Krishna Mohan and Meenakshi Raman: **Effective English Communication** (Tata Mc-Graw Hill)[2000].

AR7114	BASIC DESIGN	L	T	P/S	C
		0	0	12	6

OBJECTIVES:

- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises that will develop the originality, expression, skill and creative thinking.
- To involve students in a number of exercises to understand the grammar of design and visual composition.
- To enable the understanding of 3 D Composition by involving students in a number of exercises which will help generation of a form from a two dimensional / abstract idea.
- To enable the understanding of the relationship between the grammar of design and architecture by involving the students in seminars/ workshops and simple exercises which will look at building form analytically.

CONTENT:

Introduction to Architectural Design through Basic Design – Elements of Design : Properties, qualities and characteristics of point, line, direction shape, form, colour and texture – Principles of Design: Scale, Proportion, Balance, Harmony, Rhythm and Contrast.

The course shall be conducted by giving a number of exercises in the form of design studios, seminars and creative workshops that are aimed at teaching the following:

i) Elements and Principles of Visual Composition using point, line, shape.

ii) Exploring colour schemes and their application in a visual composition and in Architectural forms and spaces.

iii) Study of texture and schemes of texture both applied and stimulated and their application.

iv) Study of linear and Planar forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol etc.

v) Study of Solids and voids to evolve sculptural forms and spaces and explore the play of light and shade and application of color.

vi) Study of fluid and plastic forms using easily moldable materials like clay, plaster of Paris etc.

vii) Analytical appraisal of building form in terms of visual character, play of light and shade, solids and voids etc.

viii) Application of Basic design in Architectural Design through the manipulation of line, plane, solid and voids and application of texture colour, proportion etc.

TOTAL: 180 PERIODS

OUTCOMES:

- An understanding of the qualities of different elements as well as their composite fusions.
- An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects.

Attested

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TEXTBOOKS:

1. Owen Cappleman & Michael Jack Jordon, Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993.
2. Charles Wallschlacgerm & Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, McGraw Hill, New York 1992.

REFERENCES:

1. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
2. Francis D. K. Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canada), 1979.
3. Elda Fezei, Henry Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
4. C. Lawrence Bunchy - Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y. 10001, 1972.
5. Exner. V, Pressel. D, Basics Spatial Design, Birkhanser, 2009.

AR7201	BUILDING MATERIALS I	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of conventional materials such as soil, lime, rocks, stones, Clay and products from Flora.

UNIT I SOIL **09**

Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Types of Stabilizers, Requirements and Types of mud wall building and surface protection. Types of lime, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty, Precautions in handling and uses of lime.

UNIT II BAMBOO **09**

Bamboo anatomy, Properties, strength, processing, harvesting, and working of Bamboo tools. Treatments and preservation of Bamboo and uses of Bamboo. Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof.

UNIT III TIMBER **09**

Classification & structure of trees, Defects in timber, Storage of timber, Uses of timber, Conversion & seasoning of timber, Defects and diseases, Decay of timber and treatment of timber. Market forms of timber, Industrial timber.

UNIT IV STONE **09**

Classification of rocks, Sources, Seasoning, Dressing, Characteristics and testing and uses of stones. Stone veneering, preservation of stones Deterioration of stones, Durability, Preservation, Selection of stones, Artificial stones. Clay products Manufacture and uses in buildings, finishes, appliances, pipes and fittings.

UNIT V PAINTS **09**

Composition, characteristics, preparation, Primer, Painting different surfaces. Enamels, Paint, Varnishing – types of varnishing Miscellaneous paints, defects, uses and cost of materials.

TOTAL: 45 PERIODS

OUTCOMES:

- Students are sensitized to the use of naturally occurring materials such as lime, timber, stones in the context of creating a green architecture and to know about the constituents of paints, preparation and surface application of paints.

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REFERENCES:

1. S.K. Duggal, Building materials, Oxford and IBH publishing Co, put, Ltd, New Delhi 110001, 1997.
2. Dunkelberg (K), Bambus – Bamboo, Bamboo as a Building Material, Karl Kramer Verlag Stuttgart, 2000.
3. R.J. Spencke and S.J. Cook, Building materials in developing countries, John Wiley and sons 1983.

AR7202 MECHANICS OF STRUCTURES I

L	T	P/S	C
2	2	0	3

OBJECTIVES:

- To make students aware of how structural resolutions are important in realization of architectural design concept. At this stage, students shall be exposed to forces, moments, and resolution of forces.
- To make the students understand basic properties of solids and sections which influence their behavior under the effect of various types of forces.

UNIT I FORCES AND STRUCTURAL SYSTEMS 16

Principles of statics- Forces and their effects-Types of force systems - Resultant of concurrent and parallel forces--Lami's theorem- principle of moments -Varignon's theorem - principle of equilibrium –Types of supports and loadings –Determination of reactions for simply supported beams - simple problems.

UNIT II ANANLYSIS OF PLANE TRUSSES 12

Analysis of plane trusses **-** Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints and method of sections.

UNIT III PROPERTIES OF SECTION 12

Properties of section -Centroid- Moment of Inertia - Section modulus – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis –simple problems.

UNIT IV ELASTIC PROPERTIES OF SOLIDS 10

Elastic properties of solids –concept of stress and strain –deformation of axially loaded simple bars-types of stresses- Concept of axial and volumetric stresses and strains. (excluding composite bar).

UNIT V ELASTIC CONSTANTS 10

Elastic constants –Elastic Modulus-Shear Modulus- Bulk Modulus-Poisson's ratio - Relation between elastic constants - Application to problems.

TOTAL: 60 PERIODS

OUTCOMES:

- Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.
- Students are taught basic geometric properties and the behavior of materials under effect of forces.

TEXTBOOKS:

1. R.K.Bansal – A text book on Engineering Mechanics, Lakshmi Publications, Delhi, 2005.
2. R.K.Bansal – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

REFERENCES:

1. P.C.Punmia, Strength of Materials and Theory of Structures; Vol. I, Lakshmi 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.

AR7211 ARCHITECTURAL DRAWING II

L	T	P/S	C
1	0	4	3

OBJECTIVES:

- To involve students in a number of exercises that will help them develop the skill of representation in advance drawing techniques involving perspective and sciography.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advance techniques of representation.

UNIT I PERSPECTIVE METHODS 15

Introduction to the concept of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes using picture plane method and measuring point method. Introduction to three point perspective.

UNIT II PERSPECTIVE: BUILDING INTERIOR 10

Construction of one, two and three-point perspective grids - Construction of one and two point perspective of building interiors. Understanding the basic human proportion and scale. Adding of human figures, planters, furniture etc. in an interior perspective scene. Basic applications of shade and shadows and rendering techniques.

UNIT III PERSPECTIVE: BUILDING EXTERIOR 15

Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.
Introduction to short cut perspective method. Construction of one, two and three point perspective of building exterior. Adding of human figures, trees etc., Application of light and shadow and rendering techniques of building materials.

UNIT IV MEASURED DRAWING: HISTORIC DOCUMENT STUDY 20

Documentation and drawing of a simple historic building along with the relevant study of the building based on its history, morphology and context. Measured drawing using pen and ink rendering technique.

UNIT V MEASURED DRAWING: BUILDING DOCUMENTATION 15

Complete documentation of a building of special interest in terms of building construction, architectural excellence or technology using photographs, tapes etc. Measured drawing of plans, elevations, sections, isometric projections of building details etc. using pen and ink rendering technique.

TOTAL: 75 PERIODS

OUTCOMES:

- Ability to construct the 3d views and perspective drawings of the buildings.
- Understanding of advanced documentation and measured drawing techniques.

REFERENCES:

1. John M. Holmes, Applied Perspective, Sir Isaac, Piotman and Sons Ltd., London 1954.
2. Robert W. Gill, Basic Perspective, Thames and Hudson, London, 1974.
3. Leslie Martin C., Architectural Graphics, The Macmillan Company, New York, 1964.
4. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975.

AR7212 BUILDING CONSTRUCTION I

L	T	P/S	C
1	0	4	3

OBJECTIVES:

- To study the principles of designing components of load bearing structures – foundation, plinth, wall, roofing systems, flooring, spanning of openings, fins and projections.
- To understand the need for and study the principles and practices of monolithic and masonry construction, arches, lintels/ beams, corbelling, cantilever etc.
- To understand the details of construction using the stone and soil as well as products derived from them.

UNIT I INTRODUCTION 12

Planning and design of simple load bearing structures- typical parts of the load bearing structure- types of foundations – methods of spanning openings (lintel, arches, corbelling, beams) - types of roofs.

UNIT II MUD CONSTRUCTION 18

Cob, Rammed earth, Wattle and daub construction- Principles of Masonry construction using Adobe, Compressed Stabilized Earthen Blocks; Foundation and plinth for mud structures, Design of openings (arches, corbelled arches), Mud plaster, mud mortar, Damp and weather proofing of mud structures, Mud flooring ‘ Construction of thatched roof.

UNIT III CONSTRUCTION USING STONE 15

Principles of stone masonry construction- types of stone masonry- stone finishes- jointing- types of mortar for stone construction- Stone masonry for foundation, plinth and wall, retaining wall, arches and lintels in stone, coping, steps, Stone Flooring, Stone cladding, Application of Artificial stone.

UNIT IV CONSTRUCTION USING BRICK AND OTHER CLAY PRODUCTS 15

Principles of brick masonry construction- types of brick masonry- joints, pointing and finishing- types of mortar & mortar mix for brick construction- Plastering - Brick masonry for foundation plinth and wall, arches and lintels in brick, coping, steps, Brick paving- Roof using pan/ pot tiles, Mangalore pattern tiles- Flooring using clay tiles, ceramic tiles and vitrified tiles.

UNIT V COMPOSITE/ ALTERNATE CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES 15

Composite walls, Cavity walls in stone and brick, jack arch flooring, domes/ vaults, prefabricated brick panels, precast curved brick arch panels, reinforced brick/ reinforced brick concrete slabs, Prefabricated floor/ roof using structural clay units, Hourdi block roofing, Guna tile roofing.

TOTAL: 75 PERIODS

OUTCOMES:

- Students learn construction details using traditional and conventional building materials such as mud, bamboo, straw bale, stone through drawing as well as doing a literature or live case study. Students are to submit drawing plates comprising of technical plan, elevation and section along with sketches and details showing method of construction.

TEXTBOOKS:

1. Arora S.P. and Bindra S.P., “Text book of Building Construction”, Dhanpat Rai & Sons, New Delhi, 2012.
2. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.
3. National Building Code Of India 2005- Part 6 Structural Design- Section 3 Timber and Bamboo.
4. Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

REFERENCES:

1. Ghanshyam Pandya, M.P. Ranjan, Nilam Iyer Bamboo and Cane Crafts of Northeast India; National Institute of Design (2004).
2. Don A. Watson Construction Materials and Processes McGraw Hill 1972.
3. WB Mckay Building construction, Vol 1,2, Longman UK 1981.
4. Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.

AR7213 THEORY OF ARCHITECTURE L T P/S C
2 0 2 3

OBJECTIVES:

- To make the students learn the theoretical aspects of design and understand how it could be manifested in architectural design.
- To understand the ideologies from works of architects and planners.

- To learn the design communication skills to enable to put forth the design ideas in graphics and literature.

UNIT I ELEMENTS OF DESIGN IN NATURE 10

Points, lines and shapes found in nature. Role of elements to emphasize the location, as landmark, for direction and dominance, etc. Patterns in nature and building design. Chaos and Order. Study : examples of nature inspired man made design.

UNIT II PRINCIPLES OF ORGANIZATION FROM NATURE 15

Fractals – patterns, proportion, repetition, harmony- Proportion-Examples from historical buildings and Works of architects. Analysis and form generating exercises.

UNIT III COMPOSITION OF SHAPES / FORMS 15

Composition. Two dimension to three dimension .Figure and ground, positive and negative spaces. Axis, Symmetry/Asymmetry, Massing, Form generating exercises to approach site planning in small scale and large scale projects. Examples and Analysis.

UNIT IV CONCEPTS IN ARCHITECTURAL DESIGN 10

Concept – types- Ideas and Intent in design - Intuitive, contextual, Iconic, Experiential, Environmental, Energy based, Symbolic, Modular, etc. Ideologies and philosophies of architects. Exercises.

UNIT V DESIGN COMMUNICATION AND GRAPHICS 10

Importance of graphics in architectural design. Study of site plans, city plans, conceptual drawings. Interpretation of architects' conceptual sketches and the respective buildings. Exercises on writing articles on design projects.

TOTAL: 60 PERIODS

OUTCOMES:

- A thorough understanding on the definition of architecture; elements of architectures of form.
- An exposure to the principles of architecture and applications of the same in buildings and spaces.
- An understanding the meaning of character and style of buildings with examples.
- An exposure to students on ideologies and philosophies of architectures of contemporary.
- An exposure to analysis and experience of architecture through case studies and architects through examples.

TEXTBOOKS:

1. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, Analysing Architecture, Routledge, London, 2003.
3. V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.

REFERENCES:

1. Leland M. Roth - Understanding Architecture, its experience history and meaning, Craftsman house, 1994.
2. Steen Eiler Rasmussen - Experiencing architecture, MIT Press, 1964.
3. Peter von Meiss -Elements of architecture - from form to place, Spon Press 1992.
4. Rudolf Arnheim- The dynamics of architectural form, University of California Press 1977.
5. Neils Prak, The language of Architecture; Mounton & Co 1968.
6. Paul Alan Johnson - The Theory of Architecture - Concepts and themes, Van Nostrand Reinhold Co., New York, 1994.
7. Helen Marie Evans and Carla David Dunneshil, An invitation to design, Macmillan Publishing Co. Inc., New York, 1982.

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AR7214	ARCHITECTURAL DESIGN I	L	T	P/S	C
		0	0	12	6

OBJECTIVES:

- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
- To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.
- To involve students in a small scale building project(s) which will sensitize them to intelligent planning that is responsive to the environmental context.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts and architectural program.
- To engage in discussion and analytical thinking by the conduct of seminars/ workshops.
- To enable the presentation of concepts through various modes and techniques that will move constantly between 2D representation and 3D modeling.

CONTENT:

Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy.

Areas of focus/ concern:

• Architectural form and space.
• Aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.
• Function and need: user requirements, anthropometrics, space standards, circulation.
• Image and symbolism.

Typology/ project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children's environment, snack bar, residence, petrol bunk, fire station.

TOTAL: 180 PERIODS

OUTCOMES:

- The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization.
- The students shall be learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project.

TEXTBOOKS:

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. Hideaki Hareguchi, A Comparative analysis of 20th century houses, Academy Editions, 1988.
2. Robert Powell, Tropical Asian House, Select Books, 1996.
3. Terence Conran; The Essential House Book, Conran Octopus, 1994.
4. Sam F.Miller, Design Process: A Primer for Architectural and Interior Design, VNR; 1995.

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AR7301 HISTORY OF ARCHITECTURE AND CULTURE II

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To understand the influence of social, political influences on the evolution of various styles of Architecture.
- To gain knowledge of the development of architectural form with reference to technology, style and character.

UNIT I ANCIENT INDIA AND THE EVOLUTION OF BUDDHIST ARCITECTURE **09**

Indus Valley Civilization: culture and pattern of settlement - Vedic culture - Vedic village and the rudimentary forms of bamboo and wooden construction and its influence on subsequent forms of Buddhist architecture – Origins and evolution of Buddhism - Hinayana and Mahayana Buddhism and evolution of building typologies - Chaitya halls and Viharas with relevant architectural examples of built and rock cut architecture.

UNIT II EVOLUTION OF HINDU TEMPLEARCHITECTURE **09**

Hindu forms of worship – Evolution of temple form - meaning, symbolism, ritual and social importance- Categories of early temple architecture- With relevant architectural examples from Gupta and Chalukya periods- South Indian history and the relation between Bakthi period and temple architecture.

UNIT III TEMPLEARCHITECTURE – DRAVIDIAN AND INDO ARYAN **09**

Dravidian Architecture – Evolution of Dravidian order and Architecture under the rule of Pallavas, Cholas Nayakas and Vijayanagar kingdoms with relevant examples - Evolution of temple complex and temple towns - Evolution of the temple gateways with relevant examples. Indo Aryan temple architecture of Gujarat, Orissa, Madhya Pradesh and Rajasthan - their salient features - with relevant architectural examples - architecture of step wells and their social importance.

UNIT IV ISLAMIC ARCHTIECTURE AND THE INFLUENCE OF DELHI SULTANATE RULE IN INDIA **08**

A short history of Islam- Islamic architecture as rising from Islam as a socio cultural and political phenomenon - evolution of building types in terms of forms and functions under Delhi Sultanate: mosque, tomb, minaret, madarasa - Character of Islamic architecture understood through relevant architectural examples.

UNIT V ISLAMIC PROVINCIAL STYLE AND MUGHAL ARCHITECTURE **10**

The development of the Islamic Provincial styles in various provinces of Gujarat, Punjab, Bengal and the Deccan with relevant architectural examples.

Contribution of the Mughals under Humayun, Akbar and Shajahan to the architecture (tombs, mosques and forts) and city planning with relevant architectural examples.

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding of Indian architecture as a response to the political and socio cultural conditions present in India at different points of time.
- An understanding of the formations of a new religion and its influence on the architecture of its lands.
- Development of monuments, cities and landscape design and various technologies used for the construction of the same.

TEXTBOOKS:

1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 2014.
2. 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.
3. Robert Hillenbrand, Islamic Architecture- Form, Function and Meaning, Edinburgh University Press 1994.
4. Christopher Tadgell, The East - Buddhists, Hindus and The Sons of Heaven, Routledge 2008.

REFERENCES:

1. George Michell, The Hindu Temple, BI Pub., Bombay, 1977.
2. Christopher Tadgell, The History of Architecture in India, Penguin Books (India) Ltd, New Delhi 1990.
3. R. Nath - History of Mughal Architecture Vols I to III - Abhinav Publications - New Delhi, 1985.
4. Catherine Asher, Architecture of Mughal India, Cambridge University Press 2001.

AR7302 MECHANICS OF STRUCTURES II

L	T	P/S	C
2	2	0	3

OBJECTIVES:

- To enable a student to understand the basic concepts of shear force and bending moment acting on beams subjected to various loading conditions through exercises.
- To determine the stresses in beams and strength of sections by working out problems.
- To calculate deflection of beams using methods and to study the theory of columns by working out problems.
- To understand the concept of indeterminate structure and its analysis.

UNIT I BENDING OF BEAMS 16

Beams and supporting conditions - Types of supports – Shear force and bending moment for Simply supported, Cantilever and Over hanging beams - Theory of simple bending - Stress distribution at a cross section due to bending moment and shear for Rectangular, I and T sections - concept of Flitched beams (no mathematical calculation).

UNIT II DEFLECTION OF BEAMS 12

Relation between slope, deflection and curvature-Determination of deflection and slope for simply supported and Cantilever beams using Double Integration Method, Macaulay's method and Moment Area Method.

UNIT III THEORY OF COLUMNS 10

Columns- Concept of Axial and eccentric loads on columns- Combined bending and axial load – Euler's and Rankine formulae for columns - simple problems.

UNIT IV STATICALLY INDETERMINATE BEAMS 08

Introduction-Determination of degree of statical indeterminacy for beams and frames-advantages and disadvantages-method of consistent deformation-application to simple problems.

UNIT V CONCEPTS IN ANALYSIS OF STRUCTURES 14

Method of Moment distribution for continuous beams and Single portal frames - Concept of load distribution for structural systems and overall stability like a) One way b) Two way c) Arches e) portal frames f) Space Structures.

TOTAL: 60 PERIODS

OUTCOMES:

At the end of the course, the student should be able to

- Apply the concepts of determining the techniques of finding the stresses.
- Use the theory of simple bending to find the deflection in beams.
- Analyze and solve the different types of columns and analyze the different types of indeterminate beams.

TEXTBOOKS:

1. R.K. Bansal, A Text Book on Strength of Materials – Laxmi Publications, New Delhi, 2006.
2. B.C. Punmia, SMTS-I, Strength of Materials – Laxmi Publications, New Delhi, 1994.
3. POPOV, E.P., Mechanics of solids, Prentice - Hall Inc, Englewood Cliffs, New Jersey – 1976.
4. S. Ramamrutham and Narayanan R., Strength of Materials, Dhanpat Rai Publications, New Delhi, 2002.

REFERENCES:

1. Timoshenko, C.P., and Gere., Mechanics of materials, McGraw - Hill Book Company, New York, 1984.
2. Khurmi R.S., A text book of Engineering Mechanics, S. Chand and Co, New Delhi,1999.
3. M.M. Ratwani & V.N. Vazirani, Analysis of Structures, Vol. 1, Khanna Publishers – Delhi,1987.
4. A.R. Jain and B. K.J ain, Theory and analysis of structures, Vol. 1, Nemchand and Bros, Roorkee; 1987.
5. Laudner T.J. and Archer R.R., Mechanics of Solids in Introduction, McGraw - Hill International Editions, 1994.

GE7251 ENVIRONMENTAL SCIENCE AND ENGINEERING

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth's interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - 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 ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds. Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 08

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 – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10

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, floods, 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.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 07

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 06

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

OUTCOMES:

- Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
- Public awareness of environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions.
- Development and improvement in std. of living has lead to serious environmental disasters.

TEXTBOOKS:

1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004).
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, (2006).

REFERENCES:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia',Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD,New Delhi,2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press (2005).

AR7311	BUILDING CONSTRUCTION II	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To understand both in general and in detail the methods of construction by using basic materials such as bamboo, straw products and natural timber for both structural and non-structural components.
- To understand both in general and in detail the methods of construction by using man-made timber products such as ply wood.
- To understand the material's workmanship and performance for the topics discussed and to understand how these materials come together to create a building as a whole.

UNIT I BAMBOO AND STRAW BALES 15

BAMBOO : Design and Construction Techniques using bamboo for building components including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies.

STRAW BALES : Design and Construction techniques using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems, Roofing options, plastering, door and window detailing for small scale buildings and understanding of the same through case studies

UNIT II TIMBER JOINERY 15

Design and construction techniques using natural timber in joinery works including methods of fixing and options for finishing – Windows, door, ventilators (hinged, pivoted, louvered, sliding, etc) – Hardware for doors, windows and ventilators - Exercises involving the above through drawings and application of the above for a single or (G+1) building with schedule of joinery.

UNIT III TIMBER WALLS, FLOORS, TRUSSES AND STAIRCASES 20

Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses - Exercises involving the above through case studies - Types of timber staircases. Methods of construction of timber staircases- basic principles and design details including detailing of handrail and baluster- Exercises involving the above through drawings.

UNIT IV TIMBER PARTITIONS, PANELLING, FALSE CEILING 15

Methods of construction using man-made timber products such as ply woods, block boards, etc., in fixed partitions, sliding/folding partitions, wall paneling, false ceiling - Exercises of the above through drawings and case studies.

UNIT V COMPOSITE CONSTRUCTION 10

Design exercises combining bamboo, straw, timber as structural and non structural components for single storey constructions such as snack bar, tree house, etc. The study of the same through case studies.

TOTAL: 75 PERIODS

OUTCOMES:

- An understanding of natural building materials in methods of construction and in detailing.
- This also helps the student to understand the different construction practices adapted for the various components specific to the material in which its made.

TEXTBOOKS:

1. Don A. Watson, "Construction Materials and Processes", McGraw Hill, 1972.
2. W.B. McKay, "Building Construction" Vol, 1 and 2, Longmans, UK, 1981.
3. S.C Rangwala "Building Construction" Charotar Publishing House, India, 2000.
4. S.K.Sharma, "A Text book of Building Construction", S. Chand & Co Ltd., New Delhi, 1998.
5. Dunkelberg (K), "Bambus – Bamboo, Bamboo as a Building Material", Karl Kramer Verlag Stuttgart, 2000.
6. "Building with straw - Design and Technology of a Sustainable Architecture" Gernot Minke and Friedemann Mahlke Birkhauser – Publisher for Architecture Berlin – Bostan, 2005.

7. Bureau of Indian Standards. (1998). IS 875 (Part -3). Reaffirmed; Code of Practice for Design loads 1997.
8. Bureau of Indian Standards. IS 7883. Code of Practice for the Use of Glass in Buildings (2013).

REFERENCES:

1. American Institute of Timber Construction (AITC), Timber Construction Manual, Wiley Publishers, 2004.
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2008.
3. Wills H Wagner, Howard Bud, Modern Carpentry, Good Heart – Wilcox publishers, Portland, 2003 . Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005.

AR7312 CLIMATE AND BUILT ENVIRONMENT

L	T	P/S	C
2	0	2	3

OBJECTIVES:

- To study human heat balance and comfort.
- To familiarize students with the design and settings for buildings for daylight and factors that influence temperature.
- To inform about the air pattern around buildings and the effect of wind on design and siting of buildings.
- To expose the students to the various design strategies for building in different types of climatic zones.

UNIT I CLIMATE AND HUMAN COMFORT 10

Climate and Civilization. Factors that determine climate of a place- Components of climate- Climate classifications for building designers in tropics- Climate characteristics. Human body heat balance- Human body heat loss- Effects of climatic factors on human body heat loss- Effective temperature- Human thermal comfort- Use of C. Mahony's tables.

UNIT II DESIGN OF SOLAR SHADING DEVICES 15

Movement of sun- Locating the position of sun- Sun path diagram- Overhead period- Solar shading- Shadow angles- Exercises in the design of appropriate shading devices.

UNIT III HEAT FLOW THROUGH BUILDING ENVELOPE CONCEPTS 10

The transfer of heat through solids – Definitions – Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity – Surface resistance and air cavities – Air to air transmittance (U value) – Time lag and decrement – Types of envelops with focus on glass- Exercises involving software for design analysis.

UNIT IV AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS 10

The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally induced air currents – Stack effect, Venturi effect – Use of court yard- Experiments as relevant.

UNIT V CLIMATE AND DESIGN OF BUILDINGS 15

Design strategies in warm humid climates, hot humid climates, hot and dry climates and cold climates – Climate responsive design exercises for various contexts.

TOTAL: 60 PERIODS

OUTCOMES:

- Understanding of Thermal balance in Human beings.
- Designing Climate responsive structure.
- Conceptual understanding of Air flow in Buildings.

TEXTBOOKS:

1. O.H. Koenigsberger and Others, Manual of Tropical Housing and Building – Part I - Climate design, Orient Longman, Madras, India, 2010.
2. Bureau of Indian Standards IS 3792 (1987), Hand book on Functional requirements of buildings other than industrial buildings, (Part I – IV), Manakbhavan, 9, Bahadur Shah Zafar, Marg, New Delhi – 110 002.

REFERENCES:

1. Martin Evans Housing Climate and Comfort – Architectural Press, London. (1980).
2. B. Givoni Man, Climate and Architecture, Architectural Sciences Series – Applied Science Publishers Ltd., London (1981).
3. B. Givoni Passive and Low Energy Cooling of building, Van Nostrand Reinhold New York, USA. (1994).
4. Galloe, Salam and Sayigh A.M.M. "Architecture, Comfort and Energy", Elsevier Science Ltd., Oxford, U.K. (1998).
5. Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings, Arvind Krishnan, Szokolay et.al, Tata McGraw Hill, 2010.

AR7313	ARCHITECTURAL DESIGN II	L	T	P/S	C
		0	0	14	7

OBJECTIVES:

- To enable a firsthand understanding of the basic aspects of architecture and interrelationships among them through personal exploration- experiential form/space, space planning and activities, user perception and behavior.
- To supplement this understanding through theoretical studies.
- To understand the characteristics of site and the importance of site planning.
- To understand the potential of materials and construction in architectural experience
- To enable the presentation of concepts through 2D drawings, sketches and model.

CONTENT:

Scale and Complexity: Projects involving organization of multiples of single unit space with predominantly horizontal movement as well as single use public buildings of small scale; passive energy

Areas of concern/ focus:

Individual development of subjective and objective capacity for thought in study and design.
Built form-open space relationships, spatial organization
Environment behavior studies, especially those relating to children
Site planning
Appropriate materials and construction

Suggestive Typologies/ Projects: residential buildings, small institutional, civic and public buildings- nursery/ primary schools, schools for children with special needs, primary health center, banks, neighborhood market, neighborhood library, other projects- gate complexes including security kiosk and entry / exit gates.

TOTAL: 210 PERIODS

OUTCOMES:

- The students would be able develop ideational skills towards creating desired user experiences through architectural form and space. They would be able to exploit the site as a positive element in architecture. They would be able to express their ideas in the form of simple expressive sketches, manual drawings and models.

TEXTBOOKS:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGrawHill Professional 2001.
2. Julius Panero, Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design, 1975.
3. Steen Eiler Rasmussen, Experiencing Architecture; MIT Press; 1959.
4. Kevin Lynch, Site planning, MIT Press, Cambridge, 1967.

REFERENCES:

1. Richard P. Dober, Campus Planning - Reinhold Book Corporation, 1963.
2. Sam F.Miller, Design Process: A Primer for Architectural and Interior Design, Van Nostrand Reinhold, 1995.
3. Dudek M, Schools and Kindergartens, Birkhauser 2007.

AR7401	BUILDING MATERIALS II	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of contemporary materials such as cement, glass, ferrous and nonferrous metals, plastics and other materials used for advanced construction.
- To sensitize the students by understanding the use of these materials innovatively and for advanced constructions.

UNIT I CEMENT AND CONCRETE 09

The composition, strength, properties, manufacture, test for cement, types of cement - Sources, properties, uses and tests for sand, coarse aggregate and water for mortar and concrete. Definition, properties, specification, proportioning, water-cement ratio, workability, curing, water-proofing, guniting, special concretes.

UNIT II MANUFACTURING AND TYPES OF CONCRETE 09

Manufacture, construction of formwork, placing, quality assurance testing, fabrication, incorporation of steel in concrete.

Types of concrete aggregates and concrete - Lightweight aggregates, aerated concrete, no-fines concrete, polymer concrete, RCC, pre-stressed concrete, fibre-reinforced concrete, ready-mixed concrete.

UNIT III FERROUS AND NO-FERROUS METAL 09

Brief study on the properties, Manufacturing process, treatments, market forms and application of ferrous & non-ferrous metals and their alloys.

UNIT IV PLASTICS 09

The Properties, Types, uses and application of Plastics in building industry. The importance and application of Adhesives and sealants Polycarbonate sheeting, Teflon coated sheets, PTFE Steel alloys properties and uses) - Adhesives, Sealants and joint fillers (Relative movement within buildings, types of sealants- elasto-plastic, elastic sealants- joint design- fire resistant sealants- gaskets adhesives, epoxy, wall paper, bitumen, plastic pipe) - Materials for flooring finishes such as epoxy, oxy-chloride, hardeners, PVC, carpets.

UNIT V GLASS AND ADVANCED BUILDING MATERIALS 09

Composition of glass, brief study on manufacture, treatment, properties and uses of glass. Types of glass- float glass, cast glass, glass blocks, foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in building industry, glazing and energy conservation measures. Advanced Construction materials by BMTPC, SERC, etc. Light-roofing materials (Recent trends in roofing materials like Corrugated GI Sheets, Pre-coated metal sheets

TOTAL: 45 PERIODS

OUTCOMES:

- The course helps to understand the materials of construction such as cement, concrete, metals, Plastics and advanced materials application in the building industry.

TEXTBOOKS:

1. S.K. Duggal, Building materials, Oxford and IBH publishing Co, put, Ltd, New Delhi 110001, 1997.
2. M.S.Shetty, Concrete Technology, S.Chand & Co.ltd,New Delhi,1986.
3. Arthur Lyons - Materials for Architects and Builders - An introduction Arnold, London, 1997.

REFERENCES:

1. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999.
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000.
3. W.B. McKay, “Building Construction” Vol, 1 and 2, Longmans, UK, 1981.
4. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and Other research organization.
5. R. Chudley**,** Construction Technology, Richard Clay, Chanur Press, 1980.

Attested

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AR7402	EVOLUTION OF HUMAN SETTLEMENTS	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To introduce the elements of human settlements and to outline the origins, determinants of human settlements and their evolution through the course of history.
- To study the characteristics of Human settlements and the manifestation of settlements as expression of political aspirations.

UNIT I ELEMENTS AND ORIGIN OF HUMAN SETTLEMENTS 06

Origins of civilization. Elements and determinants of Human settlements. Evolution of Human Settlements in the pre-historic period with relevant examples

UNIT II RIVER VALLEY CIVILIZATIONS 09

Growth of human settlements in the ancient river valley civilizations of Indus valley, Mesopotamia, Egyptian and Chinese. Emphasis on the layout and patterns of the settlements and the influence of resources on them.

UNIT III THE CLASSIC PERIOD AND MEDIEVAL EUROPE 10

Classic period- Greek and Roman civilizations with relevant examples- Medieval and Renaissance Periods with relevant examples- Sforzinda and Utopia- Origin of cities and theories on city planning. City plans of Vienna, Amsterdam, Paris- Role of defense, trade and other factors in the development of settlement planning.

UNIT IV EVOLUTION OF HUMAN SETTLEMENTS IN INDIA 10

Medieval Indian cities, factors that led to their development. Influence of Islamic and Mughal in the evolution of settlements planning. Colonial period and its influence – Imperialism in city planning-New Delhi and Development of Cantonment cities such as Bangalore.

UNIT V EVOLUTION OF MODERN PLANNING CONCEPTS 10

Transition to the Industrial city- Post industrial Age-Visionary/ Utopian city concepts by Le Corbusier, Frank Lloyd Wright, Archigram, Metabolism and Paolo Soleri.

TOTAL: 45 PERIODS

OUTCOMES:

- The course enables the understanding of the factors that led to the growth of settlements and the changing scenario in the contemporary world.

TEXTBOOKS:

1. Mumford L, The city in History, Harcourt, Brace and World, New York, 1961.
2. Morris A E J, History of Urban form before the Industrial Revolution, Routledge, 1994.
3. Spiro Kostof, The city shaped: Urban patterns and Meaning through history, Thames, and Hudson 1999.

REFERENCES:

1. Spiro Kostof, The city Assembled: Elements of Urban form through History, Thames, and Hudson, 2005.
2. Dutt B.B, Town Planning in Ancient India, Thacker Spink & Co., Calcutta, 1995.
3. Simon Eisner, Arthur Gallion, Stanley Eisner, Urban Pattern, John Wiley & Son, New York, 1999.
4. Combaire J, How cities Grew, The Florham Press, Madison, N.J 191959.
5. Willem van Vliet, Cities in a Globalizing World: Global Report on Human Settlements 2001.
6. United Nations Center for Human Settlements. London: Sterling, VA: Earthscan Publications, 2001.

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AR7411	BUILDING CONSTRUCTION III	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To introduce construction of building components in Reinforced Cement Concrete.
- To introduce various water proofing, insulation & protection systems and their methods of construction.
- To expose the students to the advanced construction systems developed by research institutes in the country and the detailing of the same.

UNIT I INTRODUCTION: CONCRETE CONSTRUCTION 25

Detailing of walls, roofs and flooring, foundations using RCC in simple framed buildings including detailing of RCC beams, columns, slabs (one way slabs, 2-way slab, continuous, flat slab, post-tension slab etc.,), detailing of apertures (lintels, sunshades, arches etc.,) Exercises of the above through case studies and drawings of selected building types. Staircases - basic principles, for different types of staircase for support conditions for stairs and details of handrail, baluster etc. and finishes for stairs - Exercises of the above through case studies and drawings.

UNIT II WATER-PROOFING AND DAMP-PROOFING OF CONCRETE STRUCTURES 10

Construction methods for water-proofing and damp proofing for walls, roofs, basements, retaining walls, swimming pools etc. - Exercises of the above through case studies and drawings.

UNIT III GLASS 10

Construction methods using glass for single storey glass structures like pavilions, green houses, staircases. Construction methods using glass for single/multi-storey buildings including curtain walling details – Exercises of the above through case studies and drawings.

UNIT IV ADVANCED CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES 20

Design and detailing of concrete used in advanced construction – Precast concrete, pre stressed concrete, Folded plates, Shell structures, vaults, domes, decorative concrete, insulated concrete forms (ICF), concrete for Seismic design.

UNIT V PLASTICS AND OTHER MATERIALS 10

Design and construction details using primary plastic building products for walls, partitions and roofs. Design and construction details using secondary building products for windows, doors, roof-lights, domes, and handrails. Use of GI Sheets, Polycarbonate sheets, Teflon.

TOTAL: 75 PERIODS

OUTCOMES:

- The students learn how Reinforced Cement Concrete, glass and plastics could be used for the various components of a building as well as in waterproofing and insulation and protection systems.
- The role of advanced construction techniques that have been developed are also explored.

TEXTBOOKS:

1. M. S. Shetty, Concrete Technology, S. Chand & Co. ltd, New Delhi,1986.
2. Dr. B. C. Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2005.
3. T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
4. S.P Arora and S.P Bindra, A Text Book of Building Construction - Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1990
5. Christian Schittich, “Glass Construction Manual”, Institut fur Internationale Architecktur Dokumentation GmbH & Co. KG, Munich, 2007

REFERENCES:

1. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999.
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2000.

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3. W.B. McKay, “Building Construction” Vol, 1 and 2, Longmans, UK, 1981.
4. Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005.
5. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and Other research organization.
6. Standard and Specification for cost effective innovation, Building Materials and Sequence, BMPTC Publication, New Delhi.
7. R. Chudley, Construction Technology, Richard Clay, Chanur Press, 1980.
8. R.M. Davis, Plastics in Building Construction, Battersea College of Technology, Blackie, London, 1966.

AR7412 BUILDING SERVICES I

L	T	P/S	C
2	0	2	3

OBJECTIVES:

- To study the water quality control and treatment and its distribution within a building.
- To understand the fundamentals of waste disposal from a building and the guidelines for planning a sewerage system.
- To expose the students to water and waste management concepts.
- To familiarize the students with equipment for management of usable water and waste water.

UNIT I WATER QUALITY CONTROL AND DISTRIBUTION SYSTEM 12

Sources of water- Quality of water for domestic and other uses. Water treatment. Distribution to facility. Choice of pipes – Materials and sections – applications. Storage of water for domestic use and fire safety – up feed and down feed distribution systems-Layout of plumbing systems. water management- Calculation of water tank capacity - Rain water harvesting, water efficient fixtures/ fittings.

UNIT II SANITARY WASTE AND SEWERAGE SYSTEM 12

Sewage and sewerage – source, collection and disposal – types of pipes – sanitary fixtures, fittings, connectors / joints, traps and seals. Treatment plant – sizes and spatial requirements for installation in site.

UNIT III MECHANICAL SYSTEMS 12

Pumps, motors- types and applications in water supply and sanitation- location in the site and the facility- Automation systems. Energy efficient systems.

UNIT IV CASE STUDIES 12

Visit to residences/ apartments, Sewage treatment plant, hospital, hotel, office and institutions. Documentation and Analysis of water supply and plumbing systems – sources of water, water tank capacity, distribution and water management –Standards related to water supply - NBC 2005.

UNIT V EXERCISES 12

Design of water tank, plumbing systems and prepare drawings of plumbing layout-Plan, section-drawn to scale. Specification of pumps, pipes, motors, water tanks & treatment plants.

TOTAL: 60 PERIODS

OUTCOMES:

- Students have through understanding of how water and waste water are managed, in residential unit, small campus and for a large city.
- Students are aware of the principles and best practices for Solid waste management in residential unit, small campus and for a large city.

TEXTBOOKS:

1. Manual of water supply and treatment, Second edition, CPHEEO, Ministry of works and housing, New Delhi 1977.
2. AFE Wise, JA Swaffied Water, Sanitary & Waste Services in buildings – Mitchell Publishing Co. Ltd. – 2002, V Edition.

3. National Building Code 2005.
4. Indian Standard CODE OF PRACTICE FOR WATER SUPPLY IN BUILDINGS, IS : 2065 – 1983.

REFERENCES:

1. G.M. Fair, J.C. Geyer and D.Okin, Water and Waste water engineering Volume II, John Wiley & Sons, Inc. New York, 1968.
2. Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, New Delhi, 1980.
3. S.C.Rangwala, Water supply and sanitary engineering, Chartar publishing house, Anand 3888601, Lecture notes compiled by Chaman.L.Gupta, 1989.
4. Renewable energy, basics and technology, supplement volume on integrated energy systems) Solar Agni systems, Sri Aurobindo Ashram, Pondicherry 605002.

AR7413 COMPUTER-AIDED VIZUALIZATION

L	T	P/S	C
1	0	4	3

OBJECTIVES:

- To introduce Computer operation principles and explore image editing through a graphical Composition.
- To impart training in Computer aided 2D drafting and 3D Modeling through projects.
- Students will study the use of computer applications to develop a design from the initial stages to the final outcome.
- To enable the rendering of a building so as to create a photo realistic image.

UNIT I INTRODUCTION TO COMPUTER AND IMAGE EDITING 10

Technology of small computer system, computer terminology operation principles of P.C, introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc. Understanding Bitmap images and Vector Graphics, Image size and Resolution. Basic Tools for Editing and Creating Graphics.

UNIT II THE BASICS OF BUILDING MODELLING 15

Creating a basic floor plan, About Temporary Dimensions, Adding and Modifying Walls, Working with Compound Walls, Using Editing Tools, Adding and Modifying Doors, Adding and Modifying Windows

UNIT III VIEWING THE BUILDING MODEL 15

Understanding the drawing unit's settings, scales, limits, drawing tools, drawing objects, object editing, and text, dimensioning. Transparent overlays, hatching utilities, line type, line weight and colour. Multiline, Polyline, etc. Styles, blocks and symbol library.

UNIT IV INTRODUCTION TO 3D MODELLING 15

Project: Create 3D sculpture using 3D primitives (cubes, spheres etc.)

Tools: Slide facilities script attributes, V-port, editing session. Introduction to 3D-modelling technique and construction planes, drawing objects, 3D surfaces setting up elevation thickness and use of dynamic projections. Solid modeling with primitive command and Boolean operation.

UNIT V 3D RENDERING AND SETTING 20

Project: Visualize a building. Explore the potential of lights and camera and use the same in the model created for the final submission.

Tools: Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filling. Exercise to identify and visualize a building using the above said utilities.

TOTAL: 75 PERIODS

OUTCOMES:

- The students benefit by learning software which helps them to better visualize complicated forms and also helps in producing photo realistic images of those 3D forms.

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TEXTBOOKS:

1. Deke McClelland, “Photoshop 7 Bible Professional Edition”, Wiley John & Son INC, New York, 2000.
2. Aouad, “Computer Aided Design guide for Architecture, Engineering and construction”, Spon process, 2012.
3. Mohammed Saleh Uddin, Digital Architecture – 3D Computer Graphics from 50 top designers, 1999.

REFERENCES:

1. Scott Onstott, AutoCAD 2015 and AutoCAD LT 2015 Essentials: AutoDesk Official press, 2014.
2. Fiorello. J. A., “CAD for Interiors beyond the basics”, Wiley publications, 2011.
3. Ryan Duell and Tobias Hathorn, AutoDesk Revit Architecture 2015: No Experience Required: AutoDesk Official Press, 2014.

AR7414	ARCHITECTURAL DESIGN III	L	T	P/S	C
		0	0	14	7

OBJECTIVES:

- To understand the built environment as a holistic, living, entity shaped by historic socio-cultural, geographic and economic aspects.
- To make a comprehensive study of rural settlement as exemplar of collective design that evolved organically over time.
- To understand vernacular/traditional architecture and their details, including local materials and construction techniques.
- To expose the students to various methods of recording/getting information, including surveys and documentation, covering physical, visual and demographic aspects.
- To expose the students to ways of analysing, organising, interpreting and presenting information and analysis.
- To emphasise on the importance of designing built form and open spaces that meet the aspirations of the community.

CONTENT:

Scale and Complexity: Study projects involving rural settlement ; Design projects involving public and community oriented buildings within the context of human settlements -multi room, single use, small span, maximum G+2 storeyed, simple horizontal and vertical movement; active passive energy.

Area of concern/ focus :

rural settlements and architecture
community oriented design
simple public buildings set within community

Suggestive Typologies/ projects : Rural projects that involve studies and design at settlement and building level- noon meal centre, market, community centre, local buildings for economic activities, primary health centre; small community/ need oriented urban projects such as department store, campus students centre.

TOTAL: 210 PERIODS

OUTCOMES:

- The understanding of human settlements at macro and micro scale as rising from various forces would sensitize the students towards the nature and values of unselfconscious design. They would also be able to bring sensitivity in design approach in community oriented projects with respect to collective values and needs.

TEXTBOOKS:

1. Amos Rapoport, House, Form and Culture; Prentice hall; 1969.
2. Bernard Rudovsky, Architecture without Architects; Cost reduction; Architectural Press; 1964.
3. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types McGraw Hill Professional 2001.

REFERENCES:

1. Ramachandran H, Village Clusters and Rural development, Concept Publications 1980.
2. Thorbeck D, Rural design, Routledge 2002.
3. Hassan Fathy, Architecture for the Poor, University of Chicago press, 1973.

AR7501	DESIGN OF STRUCTURES I	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- To enable the design of different types of masonry walls and retaining walls.
- Also to teach the students the design of different types of timber structures and steel members.

UNIT I DESIGN OF WALLS 14

Retaining walls - Types of retaining walls -design of R.C.C cantilever retaining walls Masonry walls- Analysis and design of masonry walls-use of nomograms for design.

UNIT II DESIGN OF TIMBER STRUCTURES-BEAMS AND COLUMNS 08

Grades of timber –design of timber beams and columns- madras terrace roof design.

UNIT III CONNECTIONS IN STEEL STRUCTURES 14

Assumptions-Failure of bolted joints-strength and efficiency of bolted joints-types-design of bolted joints for axially loaded members excluding eccentric connections- Types of welded joints-advantages and disadvantages-design of fillet welds (excluding eccentric connections).

UNIT IV STEEL TENSION MEMBERS 12

Introduction-net sectional area-permissible stresses- design of axially loaded tension member-lug angle-tension splice.

UNIT V COMPRESSION MEMBERS AND BEAMS 12

Introduction-various sections-built up sections-design of columns excluding lacing and battening and other connections-Introduction to steel beams-laterally supported and unsupported beams-design of laterally supported beams.

TOTAL: 60 PERIODS

OUTCOMES:

- Understanding the design of masonry walls and cantilever type retaining walls.
- Enabling To understand the design of timber beams and columns of different grades.
- The understanding of the types, efficiency and strength of different types of connections in steel members is achieved.
- Knowledge in Design of tension members, beams and compression members(columns) in steel buildings under different conditions will help the students to visualize the structural behavior of steel buildings and also the stability aspects of such buildings.

TEXTBOOKS:

1. B.C. Punmia, Reinforced Concrete Structures, Vol. 1 & 2, - Laxmi Publications, Delhi, 2004.
2. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
3. IS 1905:1987, Indian standard for design of masonry walls-Code of Practice, Bureau of Indian Standards.
4. L.S. Negi, Design of Steel Structures – Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
5. S. K. Duggal - Limit State Design of Steel Structures, Publications, Tata McGraw Hill Education , 2005.
6. S.S Bhavikatti -Design of steel structures (as per IS 800:2007),I.K International, 2015.
7. N. Subramanian- Design of steel structures ,Oxford Higher Education, India, 2008.

REFERENCES:

1. A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
2. National Building Code of India, Part VI, Structural Design,1983.
3. Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
4. Dayaratnam.P, Design of Steel Structures, Oxford and IBH Publishing Co.
5. IS 883 – Code of Practice for Design of Structural Timber in Buildings.
6. IS 800 - 2007 – Code of Practice for use of Structural Steel in General Building Construction.

AR7502	HISTORY OF ARCHITECTURE AND CULTURE - III	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To introduce the condition of modernity and bring out its impact in the realm of architecture.
- To study modern architecture as evolving from specific aspects of modernity industrialization, urbanization, material development, modern art as well as society's reaction to them.
- To study the further trajectories of modern architecture in the post WWII period.
- To create an overall understanding of the architectural developments in India influenced by colonial rule.

UNIT I LEADING TO A NEW ARCHITECTURE 09

Beginnings of modernity –Origin and development of Neo Classicism- Structural Neo classicists: Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux, Boulle, Durand, Jefferson- Industrialization and its impact- Urbanization in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types-Growing need for mass housing- Development of Industrial material and construction technologies- concrete, glass and steel- structural engineering, standardization- Industrial exhibitions- Chicago School and skyscraper development.

UNIT II REVIEWING INDUSTRIALISATION 08

Opposition to industrial arts and production - Arts and Crafts in Europe and America : Morris, Webb- Art Nouveau: Horta, Van De Velde, Gaudi, Guimard, Mackintosh - Vienna secession: Hoffman, Olbrich- Wright's early works.

UNIT III MODERN ARCHITECTURE: DEVELOPMENT AND INSTITUTIONALISATION 12

Adolf Loos and critique of ornamentation- Raumplan: Peter Behrens- Werkbund – Modern architecture and art - Expressionism: Mendelsohn, Taut, Polzeig- Futurism- Constructivism, Cubism-Suprematism- De–Stijl Bauhaus- Gropius, Meyer and Mies -CIAM I to X and its role in canonizing architecture- growth of International Style Ideas and works of Gropius, Le Corbusier, Aalto, Mies, later works of Wright.

UNIT IV MODERN ARCHITECTURE: LATER DIRECTIONS 08

Post WW II developments and spread of international style – Later works of Corbusier: Brasilia, Unite- Works of later modernists: Louis Kahn, Paul Rudolph, Eero Saarinen, Philip Johnson.

UNIT V COLONIAL ARCHITECTURE IN INDIA 08

Colonialism and its impact- early colonial architecture: forts, bungalows, cantonments – Stylistic transformations: Neo- classicism, Gothic Revival and Indo Saracenic - PWD and institutionalization of architecture - Building of New Delhi showcasing imperial power.

TOTAL: 45 PERIODS

OUTCOMES:

- The condition of modernity and its impact on architecture has been introduced. The evolution of modern architecture from specific aspects of modernity like Industrialization, Urbanization etc. and its post-world war II trajectories were studied. An overall understanding of the architectural developments of colonial India was obtained.

TEXTBOOKS:

1. Kenneth Frampton, "Modern Architecture: A Critical History", Thames & Hudson, London, 1994.
2. Manfredo Tafuri., "Modern Architecture", Harry N. Abrams Inc, 1980.
3. Leonardo Benevolo, "History of Modern Architecture", 2 Vols. reprint, MIT Press, 1977.
4. Miki Desai et. al., "Architecture and independence", Oxford University Press, 2000.
5. William J. Curtis, "Modern Architecture since 1900", Phaidon Press, 1982.

REFERENCES:

1. Thomas Metcalf, "An imperial Vision", Faber & Faber/ Electa, 1980.
2. Christian Norburg-Schulz., "Meaning in Western Architecture", Rizzoli, Revised edition, 1993.

AR7511	BUILDING CONSTRUCTION IV	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To understand both in detail and the methods of construction using steel for structural purposes and as building components.
- To understand both in detail and the methods of construction of building components using aluminum such as doors and windows, partitions and curtain walling.
- To understand the significance of Plastic, allied products use as the building component and building finishes in door and windows, partitions, roofs and curtain walling.

UNIT I STEEL CONSTRUCTION INCULDING STAIRCASES 15

Design exercises using structural steel sections for walls, foundations, column-beam connections and design and detailing of steel roof trusses (north-light, butterfly truss, space frames etc.,) and girders including construction methods for roof covering (using steel, aluminum, asbestos, etc.), for long span structures (like hangars, factory etc.), - Steel staircases basic principles for different types of staircases - Support conditions for stairs and details of handrail, baluster etc. - finishes for stairs - Exercises of the above through case studies and drawings.

UNIT II STEEL DOORS, WINDOWS AND ROLLING SHUTTERS 15

Different Types of doors and windows (openable, sliding etc., methods of construction using steel) - Design and detailing of steel rolling shutter, collapsible gate etc.- Exercises of the above through case studies and drawings.

UNIT III ALUMINIUM DOORS, WINDOWS AND VENTILATORS 15

Brief study of aluminum products- market forms of aluminum, aluminum extrusions- sketches of the above - Aluminum doors and windows - design details for doors (openable, sliding, pivoted and fixed) - Design details for windows (openable, sliding, fixed, louvered) – Design details for Ventilators (top hung, pivoted and louvered) - Exercises of the above through case studies and drawings.

UNIT IV ALUMINIUM ROOFING, PARTITIONS, STAIRS, CURTAIN WALLING 15

Aluminum roofing (North lighting, glazing bar, roofing sheets, construction details including gutter details) - Aluminum partitions (fixed partitions, false ceiling, shop front construction methods and details) - Aluminum staircase - design and construction details- including detailing of handrail and baluster - Exercises of the above through case studies and drawings.

UNIT V COMPOSITE / ALTERNATE CONSTRUCTION TECHNIQUES AND INNOVATIVE PRACTICES 15

Composite walls, pneumatic structures, application of tensile structures, Corrugated hypar shells, single layer reticulated shells, tension hybrid membranes, sustainable steel (preco beams, cellular beams, composite slim floor beam) - Detail and use of the same through case studies ad drawings.

TOTAL: 75 PERIODS

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OUTCOMES:

- The students are able to understand in detail the method of construction of various building components using steel, aluminum and plastic.
- This also helps the student to understand the different construction practices adapted for various building components specific to the material in which its made and its innovation in terms of function and aesthetics.

TEXTBOOKS:

1. Dr. B. C. Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2004.
2. T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996.

REFERENCES:

1. Alan Blanc, Architecture and Construction in Steel, E&FN Spon, London, 1993.
2. Alan Blanc, Stairs, Steps and Ramps, Butterworth, Heinemann Ltd., 1999.
3. W.B. McKay, "Building Construction" Vol. 1 and 2, Longmans, UK, 1981.
4. Barry, Introduction to Construction of Buildings, Blackwell Publishing Ltd., Oxford, 2005.
5. Barry, Introduction to Construction of Buildings Vol. 3, Blackwell Publishing Ltd., Oxford, 2005.
6. Allan Brookes, Cladding of Buildings, E&FN Spon, London, 1998.

AR7512	BUILDING SERVICES II	L	T	P/S	C
		2	0	2	3

OBJECTIVES:

- To inform the students of the laws and basics of electricity and wiring systems within domestic and commercial buildings.
- To expose the students to the fundamentals of lighting and lighting design.
- To expose the student to the standards and byelaws related to electrical and lighting design.

UNIT I ELECTRICAL SYSTEMS: GENERATION 12

Generation of electricity- Ohms and Kichoffs Laws – units : watt, volt, amps - distribution from grid to facilities- Two phase and three phase systems -substation, transformers, generators- Types-wire, conduits- types –Applications. Lightning conductors and earthing.

UNIT II ELECTRICITY DISTRIBUTION IN BUILDINGS 12

Distribution boards, Meters, switch boards, earthing. Electrical layout drawings for low rise buildings. Energy efficient systems and renewable energy resources.

UNIT III INTRODUCTION TO LIGHTING 12

Source of light. Electromagnetic spectrum- day light, electric light,. Quality and Quantity of light levels. Types of lamps / Luminaires- Applications. Impact of lighting on human beings. Subjective impressions. Energy efficient systems.

UNIT IV LIGHTING DESIGN BASICS 12

Considerations for Lighting design- typology- room dimensions, openings design. Daylight factor. Integrated lighting. Choice of luminaires. Standards and bye laws.

UNIT V LIGHTING DESIGN: EXERCISES 12

Analysis of lighting from case studies- architects works – Lighting design for a particular typology – layout - drawings. Physical models and lighting study. Lighting simulation and performance analysis using lighting software – Autodesk Ecotect Analysis, Dialux or Lite Pro 2.0.

TOTAL: 60 PERIODS

OUTCOMES:

- The students understand the basics of Electricity and wiring system.
- The students are exposed to Fundamentals of Lighting and Lighting design.
- An understanding of vertical transportation system in a building.

TEXTBOOKS:

1. E. P .Ambrose, Electric Heating, John Wiley & Sons Inc., New York, 1968.
2. Philips Lighting in Architectural Design, McGraw Hill. New York, 1964.
3. R. G. Hopkenson & J.D.Kay, The lighting of Buildings, Faber & Faber, London, 1969.
4. Gary Gordon, Interior Lighting for Designers, 5th Edition, John Wiley & Sons Inc., New York, Feb 2015.

REFERENCES:

1. Handbook of building Engineers in metric systems, New Delhi 1968.
2. National Lighting Code 2010.
3. Descottes, Herve and Cecilia E. Ramos, Architectural Lighting: Designing with Light and Space, Princeton Architectural Press, Princeton, 2011.

AR7513	ARCHITECTURAL DESIGN IV	L	T	P/S	C
		0	0	14	7

OBJECTIVES:

- To explore the design of buildings addressing the socio- cultural & economic needs of contemporary urban society.
- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially and culturally sensitive manner in larger projects, and taking into account aspects such as large scale movement of people, identity.
- To emphasis on the importance of understanding the relationship between open space and built form, built form to built form and site planning principles involving landscaping circulation network and parking.
- To explore the addressing of functional needs in innovative ways- aspects of detailing, density, etc.,
- To introduce computer aided presentation techniques involving 2D and 3D drawings.

CONTENT:

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

Areas of concern/ focus
Socio-cultural and economic aspects
Designing for the differently abled
Building byelaws and rules
Appropriate materials and construction techniques, detailing
Climatic design

Typology/project: housing projects- detached, semi-detached, row housing, cluster housing, apartment; housing and facilities for other user groups- old age home, orphanage, working women's hostel, home for physically and mentally challenged; museum/art centre, educational campus, R & D centre, shopping complex.

TOTAL: 210 PERIODS

OUTCOMES:

- The students would be able to explore innovative design solutions in projects involving practical needs of contemporary urban society. They would be able to convey their design through aid of computers/digital media.

TEXTBOOKS:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Professional 2001.
2. Ernst Neuferts Architects Data, Blackwell 2002.

Attested

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REFERENCES:

1. Rem Koolhaas Harvard Design School Guide to Shopping, TaSchen; 2001.
2. MVRDV, FARMAX- Excursions on Density; 010 Publishers; 2006.

AR7601	DESIGN OF STRUCTURES II	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- To study the basic concepts of load transfer mechanism in structures.
- To use limit state design for the analysis and design of slabs, beams, columns, footings and staircases
- Case studies and models applicable.

UNIT I BASIC CONCEPTS 10

Loads on Structure - combination of loads in design -Effect of Temperature and Settlement – Concepts of load flow in building elements like slab, beam, column and foundation - Estimation of loads on slabs, beams, columns and foundation- Structural materials– Choice of Structural Material for different types of buildings- Methods of design -Concept of Elastic method, Ultimate load method and limit state method - Advantages of limit state method over other methods.

UNIT II LIMIT STATE DESIGN OF SLABS AND STAIRCASES 12

Behaviour of one way and two way slabs-Design of one way slabs and two way slabs for various edge conditions and corner effects , circular slabs subjected to uniformly distributed loads-design of continuous slabs using codal coefficients –Detailing of slabs using SP34-Design of doglegged staircase.

UNIT III LIMIT STATE DESIGN OF BEAMS 14

Analysis and Design of singly, doubly reinforced rectangular and flanged beams for bending and shear - Design of continuous beams using codal coefficients -Detailing of beams using SP34.

UNIT IV LIMIT STATE DESIGN OF COLUMNS 12

Long and short columns –axially loaded Rectangular and circular columns – Columns subjected to uniaxial and biaxial bending – Design of columns using column interaction diagrams – Use of SP16 – Detailing of columns using SP34.

UNIT V LIMIT STATE DESIGN OF FOUNDATION 12

Types of R.C.C. foundation –Design of wall footings, design of axially loaded rectangular pad footings and Sloped footings - Design of combined rectangular and trapezoidal footings.

TOTAL: 60 PERIODS

OUTCOMES:

- At the end of the course, the student should be able to
  Understand the different concepts in designing the structural elements like slab, beams, columns and footings.

TEXTBOOKS:

1. Park .R and Paulay .T, Reinforced Concrete Structures, John Wiley & Sonc Ic., New York, 1975.
2. Simha .N.C and Roy .S.K, Fundamentals of Reinforced Concrete, S.Chand & Co. Ltd., New Delhi, 2001.
3. B.C. Punmia, Reinforced Concrete Structures, Vol. 1 & 2, - Laxmi Publications, Delhi, 2004.
4. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
5. SP – 16, Design Aids for Reinforced Concrete to IS 456 National Building Code of India, 1983.

REFERENCES:

1. Unnikrishna Pillai .S and Devadass Menon, Reinforced Concrete Design, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1998.
2. Neville .A.M, Properties of Concrete, Pitman Publishing Co., London, 1990.
3. Purushothaman .P, Reinforced Concrete Structural Elements, Tata McGraw Hill Publishing Co Ltd., New Delhi, 1984.
4. Ramamrutham .S and Narayanan .R, Reinforced Concrete Structures, Dhanpat Kai Publication, New Delhi, 1997.
5. S.S Bhavikatti -Design of steel structures (as per IS 800:2007),I.K International, 2015.
6. N. Subramanian- Design of steel structures ,Oxford Higher Education, India, 2008.
7. A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
8. National Building Code of India, Part VI, Structural Design,1983.
9. Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
10. Dayaratnam.P, Design of Steel Structures, Oxford and IBH Publishing Co.
11. IS 883 – Code of Practice for Design of Structural Timber in Buildings.
12. IS 800 - 2007 – Code of Practice for use of Structural Steel in General Building Construction.

AR7602	SITE PLANNING AND DEVELOPMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To teach the importance of site and its content in architectural creations.
- To orient the students towards several influencing factors which governs the siting of a building or group of buildings in a given site.
- To teach various techniques of site analysis through exercises and case studies.
- To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation.
- To teach planning of site utilities and infrastructure.

UNIT I INTRODUCTION 08

Definition of plot, site, land and region, units of measurements. Introduction to survey; methods of surveying and where they are used. Modern surveying Instruments and their application such as EDMs and Total Stations. Need for surveying. Measuring and drawing out a site plan from the measurements.

UNIT II SITE ANALYSIS 08

Importance of site analysis; 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; Preparation of site analysis diagram.

UNIT III DETAILED ANALYSIS AND TECHNIQUES 10

Study of contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations. Preparation of maps of matrix analysis & composite analysis methods. Site selection criteria for housing development, commercial and institutional projects- Case Studies.

UNIT IV SITE CONTEXT AND REGULATIONS 09

Context of the site. Introduction to existing master plans land use for cities, development control Rules. Impact of proposed developments on the surroundings especially with reference to large scale projects. Aspects such as increase in traffic, noise and pollution to surroundings - Study through notable examples.

UNIT V SITE LAYOUT AND DEVELOPMENT 10

Organization of vehicular and pedestrian circulation and geometric calculation for movement; types of roads, hierarchy of roads, networks, road widths and parking regulations- Principles of positive drainage and grading for drainage – location and design of sewage treatment plants-methods to control soil erosion- Location of utility lines to simplify maintenance-planning for rain water harvesting - Incorporation of services such as drinking water pipelines, fire hydrants, communication and networking facilities at site – Improving climatological conditions on site through landscaping.

TOTAL: 45 PERIODS

OUTCOMES:

- It enables the students to effectively do site analysis and Planning towards better environments.
- Enables to plan utilities and other services for a sustainable site management.

TEXTBOOKS:

1. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
2. Edward. T. Q. Site Analysis – Architectural Media, 1983.

REFERENCES:

1. Joseph De.Chiarra (J) and Lee Coppleman - Urban Planning and Design Criteria - Van Nostrand Reinhold Co., 1982.
2. Storm Steven, Site engineering for landscape Architects, John Wiley & Sons Inc, 2004.
3. Development Control Rules – CMDA; 2008.

AR7603 SPECIFICATION, ESTIMATION AND BUDGETING

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To prepare detailed exact as well as approximate estimates to meet a number of requirements and also to have a clear picture of the project expenditure.
- To have a thorough idea regarding the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.
- To calculate the exact quantities of items of work done for affecting payment especially when direct measurements are difficult and also to determine the quantities of different materials required for various items of work.
- To draw up specifications for the different items of civil engineering project and also to prepare the schedule of programming of the project.
- To prepare valuation report of real and landed property.

UNIT I SPECIFICATION AND SPECIFICATION WRITING 10

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- Brief Specification for 1 st class, 2 nd class , 3 rd class building-Detailed specification for earthwork excavation, plain cement concrete, Reinforced concrete, first class and second class brickwork, Damp proof course, ceramic tiles/marble flooring and dado, woodwork for doors, windows frames and shutters, cement plastering, painting & weathering course in terrace.

UNIT II ESTIMATION 09

Types & purpose, Approximate estimate of buildings – Bill of quality, factors to be considered, - principles of measurement and billing, contingencies, measurement of basic materials like brick, wood, concrete and unit of measurement for various items of work – abstract of an estimate-Costs Associated with Constructed Facilities - Approaches to Cost Estimation - Type of Construction Cost Estimates - Cost Indices - Applications of Cost Indices to Estimating - Estimate Based on Engineer's List of Quantities - Estimation of Operating Costs.

UNIT III DETAILED ESTIMATE 12

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course for a single storied building.

UNIT IV VALUATION 06

Valuation - Explanation of terms-types of values, sinking fund, years of purchase- Depreciation –types of depreciation- Valuation of real properties- types, methods and purpose of valuation.

UNIT V BUDGETING 08

Elements of cash flow- Time value of Money – Capital investment decision - Types of business firms -Budget and Budgetary Control – Types of Budgets – Preparation of Financial Budget.

TOTAL: 45 PERIODS

OUTCOMES:

- Students learn the art of building construction through specification writing. Students learn to work out the approximate estimate, detailed estimate for small scale building projects and low cost housing.

TEXTBOOKS:

1. Estimating, Costing and Valuation (Professional practice) By Rangwala – S.C, 1984 CHAROTAR PUBLISHING HOUSE, INDIA.
2. M. Chakraborthi, Estimating costing & Specification in Civil Engineering; Chakraborthi; 1984.
3. Estimating & Costing – By B.W. Dutta (Revised by S. Dutta) UBS Publishers Distribution P.Ltd. India, 1983.
4. S.SangaReddi & P.L.Meiyappan, Construction Management, Kumaran Publication, Coimbatore.

REFERENCES:

1. I.S.1200-1968 Methods of measurements of buildings and Civil Engineering works.
2. Latest schedule of rates of P.W.D.
3. Latest Data book of P.W.D.
4. PWD Standard Specifications. Govt Publication.

AR7611 ARCHITECTURAL DESIGN DETAILING

L	T	P/S	C
1	0	4	3

OBJECTIVES:

- To enable students to design and develop a comprehensive set of drawings for construction of building in a site containing architect's drawings along with structural and services engineer's drawings etc.
- To focus the students on the development of a project design (a typology/ architectural design project completed in their previous semesters) from concept through analysis to create an architectural design with well develop engineering systems/ complete technical drawings by the use of computer drafting software /tools.
- To enable students to understand and appreciate the challenges in construction detailing and to train them in the aspects of detailing buildings with allied requirements namely structure, building services, Furniture, Fittings & Equipment (FFE) etc along with the installation methods.

UNIT I INTEGRATION TO ARCHITECTURAL AND STRUCTURAL DETAILING 15

Exercise involved in development and generation of architectural working drawing with detailing of floor plan , technical drawing with working drawings for Structural System most suitable for the project with integration of structural components into the design – application of appropriate Building Materials ,development of assembly drawing regarding the installation of materials.

UNIT II INTEGRATION OF SERVICE COMPONENTS OF DESIGN 15

Exercise involved in development of technical drawing with understands the integration of Electrical, Plumbing and HVAC systems into the Design.

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UNIT III DETAILING OF ARCHITECTURE COMPONENTS 15

Exercise involved in detailing of, joinery scheduling, dimensions explaining the various components. Detailing of site layout with facilities; specific Areas like Staircase, Wall-Sections, explaining the interface of the building etc.

UNIT IV DETAILING OF BUILT-IN FURNITURE AND FITTINGS 15

Exercise involved in development of technical drawing and detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting , workstation, display unit etc. as per the project typology and design.

UNIT V DETAILING OF EXTERIOR AND INTERIOR ARCHITECTURAL ELEMENTS 15

Exercise involved in development of technical drawing and detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces etc. Detailing of interior architectural elements in existing buildings.

TOTAL: 75 PERIODS

OUTCOMES:

- An understanding of the principles of design detailing as applicable to various situation in Indian context.
- The students are also exposed to various materials, furniture's, fittings and the equipments that are needed in buildings.
- The students are also exposed to integration of Structure and Services components and to deal with the project as a complex whole rather than just its parts.

TEXTBOOKS:

1. De Chiara and Callendar, Time Saver Standard Building Types, McGraw Hill Co, 1980.
2. Richardson Dietruck, Big Idea and Small Building, Thames and Hudson, 2002.
3. Edward D Mills, Planning – The Architecture Handbook, British Library Cataloguing in Publication Data, 1985.

REFERENCES:

1. Susan Dawson, Architect's Working Details (Volume 1-10), E- Map Construct; 2004.
2. Swimming Pools, Lane Book Company, Menlo Park, California, 1962.
3. Nelson L Burbank, House Carpentry Simplified, Simmons-Board- McGraw Hill Publishing Corporation, New York, 1986.
4. Landscape Construction, Delmar publisher, 2000.
5. Grant W. Reid , Landscape Graphics, Whitney Library of Design, 1987.
6. Francis. D. K. Ching, Building Construction Illustrated, John Wiley & Sons, 2011.

AR7612	ARCHITECTURAL DESIGN V	L	T	P/S	C
		0	0	16	8

OBJECTIVES:

- To understand the design and form of building typologies that are the result of pressure on urban lands with a thrust on issues like urban land economics, technology and ecology.
- To balance complex planning needs in buildings of large floor areas and diverse requirements.
- To critically question and creatively address aspects such as sustainable architecture and green buildings.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of high-rise buildings and service intensive buildings.
- To explore advanced computer aided presentation techniques involving 2D and 3D drawings and virtual models, apart from physical models.

CONTENT:

Scale and Complexity: Advanced and complex problems involving large scale multi-storeyed buildings and complexes for residential/ commercial/ institutional/ mixed-use buildings in an urban context with focus on planning aspects, service integration and sustainable practices.

Areas of focus/ issues:

Planning integration and detailing
Sustainable building practices, green issues, alternative energy
intelligent building techniques and service integration
Advanced building practices

Typology/ project: office building, multi-use centre, convention center, multiplex, corporate complex, health care and hospitality building.

TOTAL: 240 PERIODS

OUTCOMES:

- The student would be able to balance diverse aspects/ concerns of buildings by making right choices in design situations after studying various criteria. They would be able to apply knowledge in realms such as sustainable built environment, services.

TEXTBOOKS:

1. Sustainable Design, Ecology, Architecture & Planning, Daniel Williams, John Wiley & sons Inc, NJ, 2007.
2. Mili Mazumdar, Energy Efficient Buildings in India, TERI, New Delhi, 2012.
3. Sustainable Building Design Manuals I & II, TERI 2004.

REFERENCES:

1. Office - Architecture + Design, Lara Menzel, Braua Publishers 2009.
2. Prefabulous + Sustainable, Building and Customizing an affordable, Energy efficient home, Sheri Koones, ABRAMS, 2010.

AR7701	PROFESSIONAL PRACTICE AND ETHICS	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To give an introduction to the students about the architectural profession and the role of professional bodies and statutory bodies.
- To sensitize the students about the importance of code of conduct and ethics in professional practice and the mandatory provisions as per Architects Act 1972.
- To expose the students some of the important legal aspects and legislations which have a bearing on the practice of architectural profession.
- To enable the students to grasp the advanced issues concerning professional practice such as tendering, contracting including alternative practices in project execution and project management.
- To expose the students to the implications of globalisation on professional practice with particular reference to WTO and GATS and equip them for international practice.
- To facilitate practical exposure to students about Approval Process, Team work with consultants, Project management, certifications etc.

UNIT I INTRODUCTION TO ARCHITECTURAL PROFESSION CODE OF CONDUCT AND ETHICS 09

Importance of Architectural Profession and Role of Architects in Society – Registration of Architects – Architect's office and its management –, organizational structure - Infrastructure requirement, skills required, elementary accounts – Tax liabilities- Setting up Architectural Practice. Role of the Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with regard to architectural practice) – Council of Architecture (role and functions) – Importance of ethics in professional practice – Code of conduct for architects, punitive action for professional misconduct of an architect. - A visit to Architectural Practice in City - A joint discussion with IIA Chapter/Centre.

UNIT II ARCHITECT'S SERVICES, SCALE OF FEES & COMPETITIONS 09

Mode of engaging an architect – Comprehensive services, partial services and specialized services – Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement – Letter of appointment. Importance of Architectural competitions – Types of competitions (open, limited, ideas competition) – Single and two stage competitions – Council of Architecture guidelines for conducting Architectural competitions – National and International Competitions – Case studies.

UNIT III PROJECT MANAGEMENT - TENDER & CONTRACT 12

Tender -Definition - Types of Tenders - Open and closed tenders - Conditions of tender – Tender Notice - Tender documents - Concept of EMD - Submission of tender - Tender scrutiny - Tender analysis – Recommendations – Work order - E-tendering (advantages, procedure, conditions).

Contract – Definition - Contract agreement - its necessity – Contents (Articles of Agreement, Terms and Conditions, Bills of Quantities and specifications, Appendix) – Certification of Contractors Bills at various stages. New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO, etc.) - Role of Architect in Project execution stage (A visit to major project site and interaction with Project managers).

UNIT IV LEGAL ASPECTS 06

Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award – Arbitration clause in contract agreement (role of architect, excepted matters) Easement – (meaning, types of easements, Copy rights and patenting – (provisions of copy right acts in India, copy right in architectural profession) Consumer Protection Act (Intent, Architects responsibility towards his clients).

UNIT V IMPORTANT LEGISLATIONS AND CURRENT TRENDS 09

Planning Parameters evolving from master plan of a city – case study 2nd master plan CMDA-Development Regulations in Second Master Plan for CMA- Building Rules emerging from National Building Code- case study Chennai Corporation Building Rules 1972 – (A visit to CMDA and a visit Chennai Corporation) Factories Act – Persons with Disabilities Act – Barrier Free Environment – Costal Regulation Zone – Heritage Act. Globalisation and its impact on architectural profession – Preparedness for International practice – Entry of Foreign architects in India – Information Technology and its impact on architectural practice. Emerging specializations in the field of Architecture – Architect as construction / Project manager – Architectural journalism – Architectural photography.

TOTAL: 45 PERIODS

OUTCOMES:

- Understand the role of professional and statutory bodies.
- Understand the provisions in Architects Act 1972.
- Understand code of conduct.
- Understand the process and role of an architect in project execution.

TEXTBOOKS:

1. Architects Act 1972.
2. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989, Architectural Competition guidelines.
3. Roshan Namavati, Professional practice, Lakhani Book Depot, Mumbai 1984.
4. Ar. V.S. Apte, Architectural Practice and Procedure, Mrs. Padmaja Bhide, 2008.
5. Madhav Deobhakta, Architectural Practice in India, CoA; 2007.

REFERENCES:

1. J.J.Scott, Architect's Practice, Butterworth, London 1985.
2. Development Regulations of Second Master Plan for Chennai Metropolitan Area - 2026. (Second Master plan of CMA).
3. Chennai City Corporation Building Rules 1972.
4. T.N.D.M. Buildings rules, 1972.
5. Consumer Protection Act, 1986.
6. Arbitration Act, 1996.
7. Factories Act, 1948.

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8. Persons with Disabilities Act, 1995.
9. Tamil Nadu Cinematography Act. DTCP Act.

AR7702 URBAN DESIGN

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To understand the scope and nature of urban design as a discipline.
- To introduce the components of a city and their interdependent roles.
- To understand the evolution of historic urban form.
- To learn to interpret the city in different ways and layers.
- To create awareness of contemporary urban issues as well as learn about possible ways to address them.

UNIT I INTRODUCTION TO URBAN DESIGN 06

Introduction to cities, Components of urban space such as blocks, density, neighborhood, streets etc and their interdependencies - outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline.

UNIT II HISTORIC URBAN FORM 10

Overview of rise and fall of various river civilizations**.** Detailed study of urban development throughout the globe.

Western: Morphology of early cities - Greek agora - Roman forum - Medieval towns- Renaissance place making - ideal cities – Industrialization and city growth - the eighteenth century city builders Garnier's industrial city - the American grid planning- anti urbanism and the picturesque- cite industrielle- citte nuovo-radiant city.

Indian: Evolution of urbanism in India- Temple towns - Mughal city form- medieval cities - colonial urbanism- urban spaces in modernist cities: Chandigarh, Bhuvaneshwar and Gandhi Nagar subsequent directions – case studies.

UNIT III THEORIES AND ILLUSTRATIONS OF URBAN DESIGN 09

To understand urban design thru reading and illustrations. Ideas of Imageability and townscape: Cullen, Lynch- place and genius loci - collective memory historic reading of the city and its artifacts: Rossi- social aspects of urban space: life on streets and between buildings, life style, gender and class, Jane Jacobs, William Whyte. Contemporary theories in Urbanism, New Urbanism concepts.

UNIT IV URBAN DESIGN AND URBAN ANALYSIS 10

Understanding various tools thru which an urban setting could be perceived - maps, sketches, photo documentations, reading, data collections, transects etc. Students to have a broad knowledge of various techniques to read a city. The various aspects of urban growth esp. in Asian cities, city limits/boundaries, urban structure, urban architecture, typologies as well as infrastructural planning, parcellation, public space and design guidelines will be introduced. The critical role that transportation plays in structuring the city will also be examined.

UNIT V SUSTAINABLE URBAN DESIGN AND DEVELOPMEMNT 10

Overview of urban ecology. Contemporary issues of urban ecology in Asian context and its articulation towards urban design. Urban sustainability focuses on forms and flows of urban, industrial and natural systems. Two main categories of spatial typologies and ecological flows to be studied thru case studies from western as well as eastern parts of the globe. The sessions conclude with the discussion of urban and environmental design that is essential to the professional practices of ecologically sound urban and environmental design.

TOTAL: 45 PERIODS

OUTCOMES:

- The students understood the role of Urban design as a discipline, and its role in understanding and interpreting a city. Various reading methods were explored, to understand the historical as well as present urban form. They also looked at addressing urban design issues in terms of awareness creation as well as with possible ways to address them.

TEXTBOOKS:

1. A.E.J. Morris, "History of Urban Form before the Industrial Revolution", Prentice Hall, 1996.
2. Edmund Bacon , "Design of Cities", Penguin, 1976.
3. Gordon Cullen, "The Concise Townscape", The Architectural Press, 1978.
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999.
5. "Time Saver Standards for Urban Design", Donald Natson, McGraw Hill, 2003.
6. Kevin Lynch, "The Image of the City", MIT Press, 1960.
7. Rithchie. A, "Sustainable Urban Design: An Environmental Approach", Taylor & Francis, 2000.

REFERENCES:

1. Jonathan Barnett, "An Introduction to Urban Design", Harper Row, 1982.
2. Lawrence Halprin, "Cities", Reinhold Publishing Corporation, New York, 1964.
3. Gosling and Maitland, "Urban Design", St. Martin's Press, 1984.
4. Malcolm Moor, "Urban Design Futures", Routledge, 2006.
5. Geoffrey Broadbent, "Emerging Concepts in Urban Space Design", Taylor & Francis, 2003.

AR7711	BUILDING SERVICES III	L	T	P/S	C
		2	0	2	3

OBJECTIVES:

- To expose the students to the science behind an air-conditioning and refrigeration system.
- To familiarize them with the various air- conditioning systems and their applications.
- To study the design issues for the selection of various systems and their installation
- To inform of the various ways by which fire safety design can be achieved in buildings through passive design.
- To familiarize the students with the various firefighting equipment and their installation.

UNIT I AIR CONDITIONING: BASIC REFRIGERATION PRINCIPLES 06

Thermodynamics – Transfer of Heat- refrigeration cycle components – vapor compression cycle – compressors – evaporators – Refrigerant control devices – electric motors – Air handling Units – cooling towers.

UNIT II AIR CONDITIONING: SYSTEMS AND APPLICATIONS 12

Air conditioning system for small buildings and large building – Chilled water plant – All Air system, variable air volume, All water system -Configuring/ sizing of mechanical equipment, equipment spaces and sizes for chiller plant, cooling tower, Fan room, circulation Pumps, Pipes, ducts.

UNIT III AIR CONDITIONING: DESIGN ISSUES AND HORIZONTAL DISTRIBUTION OF SYSTEMS 12

Selection- Energy efficient systems - choices for small and large buildings - Horizontal distribution of services for large buildings - Grouped horizontal distribution of mechanical services. NBC 2005 and BIS.

UNIT IV FIRE AND SAFETY: DESIGN AND GENERAL 15

Causes of fire in buildings- stages of fire and how it spreads- fire drill- Heat/ fire / smoke detection, alarm and extinguisher systems- fire safety standards- NBC 2005

General guidelines for egress design for multistory buildings. Exercises on drawing layout for fire safety systems in a building type.

UNIT V VERTICAL TRANSPORTATION SYSTEMS IN BUILDINGS 15

Elevators, escalators, conveyors, travelators, dumb waiters – types and applications-round trip time, design of lift lobby and vertical transportation core. Latest technologies in vertical transport systems. Integration of lifts and escalators with building automation systems. Case study visits to commercial complexes, hospitals, apartments and offices.

TOTAL: 60 PERIODS

OUTCOMES:

- The students are exposed to various air conditioning systems and their applications.
- An understanding of fire safety, fire fighting, fire prevention and installations in buildings.
- They are also exposed to various design issues in the distribution system.
- The students are exposed to fundamentals of acoustics and its applications in buildings including code requirements.

TEXTBOOKS:

1. William H. Severns and Julian R Fellows, Air conditioning and Refrigeration, John Wiley and Sons, London, 1988.
2. Fire Safety: National Building Code of India 2005.
3. ISHRAE Handbook for Refrigeration 2015.
4. The Vertical Transportation Handbook 4th Edition - George R. Strakosch (Editor), Robert S. Caporale – Wiley and sons, 2010.

REFERENCES:

1. A.F.C. Sherratt, Air conditioning and Energy conservation, The Architectural Press, London, 1980.
2. Andrew H Buchanan; Design for fire safety, John Wiley & Sons Ltd., NY.
3. Heating, ventilating and air conditioning –Swenson S. Don, Amer Technical Pub.
4. ISHRAE : All about AHUs – Air Handling Units.
5. CIBSE Guide D: Transportation Systems in Buildings (2010).

AR7712	ARCHITECTURAL DESIGN VI	L	T	P/S	C
		0	0	16	8

OBJECTIVES:

- To develop a critical faculty/ position in architectural design with respect to various qualitative and quantitative aspects of architecture.
- To engage architectural form as an expression of philosophical/ critical ideas relating to the role of architecture in society.
- To explore techniques of mapping and diagramming to understand the built environment as well as design it.
- To create physical models and drawings that are expressive of studies and ideas.

CONTENT:

Scale and Complexity: Projects involving large campuses or groups of buildings, large scale buildings, mixed use projects involving diverse user groups.

Areas of concern/focus: exploration of relationship between building, space, landscape and movement in a context involving diverse user groups. appropriate architecture and exploration of architectural form towards a desired ideal for a given context of time and place. Meaning and identity contemporary processes in design.

Typology/ project- campus, culturally significant buildings, multiuse convention centres, multiplexes, large housing communities, corporate complexes, health care and hospitality buildings, multi use urban complexes.

TOTAL: 240 PERIODS

OUTCOMES:

- The students would be able to make creative and informed decisions in the context of large scale projects and those involving a diverse user group. They would be able to express studies and design ideas through innovative models and drawings.

TEXTBOOKS:

1. Kate Nesbitt, Theorizing a New Agenda for Architecture, Princeton Architectural Press, 1996.
2. Michelle Provoost et al. Dutchtown, NAI Publishers, Rotterdam, 1999.
3. Mark Garcia, The Diagrams of Architecture, Wiley 2010.

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REFERENCES:

1. Kevin Lynch, Site Planning, MIT Press, Cambridge, 1967.
2. Mitchell WJ, Imagining MIT: Designing a campus for the 21st century; MIT Press; 2007.
3. Campus Architecture: Building in the groves of academe, Richard P. Dober, McGraw Hill, 1996.

AR7811	PRACTICAL TRAINING	L	T	P/S	C
		0	0	0	12

OBJECTIVES:

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

CONTENT:

The Practical Training -II 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 architectural drawings 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.
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 is to be submitted for evaluation by a viva voce examination.

TOTAL: 15 WEEKS

OUTCOMES:

- To strengthen the understanding of students to the nuances of architectural practice.
- This will enable the understanding of the students about the architectural drawings, detailing, material and construction techniques, integration of structure and services and gain knowledge during client-consultant meetings and site visits.

AR7901	HUMAN SETTLEMENTS PLANNING	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To understand the factors that determined the form and structure of human settlements in the modern age.
- To understand the various planning concepts in urban, rural and regional level development plans developed for India.
- To understand the changing scenario in human settlements in the context of Globalization.

UNIT I INTRODUCTION 09

Squalor of Industrial cities and responses to them. Contributions of Ebenezer Howard, Lewis Mumford, Patrick Geddes, C.A. Perry in human settlements planning. Introduction to planning as a discipline and brief evolution of the profession.

UNIT II FACTORS AFFECTING SETTLEMENT PLANNING 09

Factors affecting settlement planning. Classification of settlements based on Location, Resource, Population size & Occupational structure. Types of settlements - Linear, non-linear and circular –Combinations – reasons for development – advantages and disadvantages – case studies – factors influencing the growth and decay of human settlements.

UNIT III RURAL AND REGIONAL DEVELOPMENT IN INDIA 09

Rural development plans, programs and policies from case studies. Regional Plan – Area delineation, Land utilization plan, hierarchical system of settlements, their sizes and functions.

UNIT IV URBAN PLANNING AND URBAN RENEWAL 09

Urban in India – Scope, Content and limitations of Master plan, Structure plan, DDP and Planned unit development - Zoning regulations need, applicability and development regulations – Urban Renewal - Redevelopment, Rehabilitation and Conservation – Urban Development Projects – case studies.

UNIT V ISSUES IN CONTEMPORARY URBAN PLANNING IN INDIA 09

Globalization and its impact on cities – Urbanization, emergence of new forms of developments – self sustained communities – SEZ – transit oriented development (TOD) – integrated townships – case studies.

TOTAL: 45 PERIODS

OUTCOMES:

- The course provides the various factors affecting the form, structure and growth of human settlements. The student understands process in planning and implementation of various plans polices and programs in rural, urban and regional level in India through case studies.

TEXTBOOKS:

1. Thooyavan K R, Human Settlements- A Planning guide to beginners, M.A.Publications, 2005.
2. Ministry of Urban affairs and Employment, government of India, New Delhi, 'Urban Development Plans: formulation and Implementation-Guidelines', 1996.
3. Andro D Thomas, 'Housing and Urban Renewal, George Allen and Unwin, Sydney, 1986.

REFERENCES:

1. S. B. Golahit Rural Development Programmes In India, Neha Publishers & Distributors, 2010.
2. CMDA Second Master Plan for Chennai Metropolitan Area 2026: Vision, Strategies and Action Plans (Vol.I, II &III). Chennai, India, (2008).
3. V. Nath, Regional Development And Planning In India, Neha Publishers & Distributors, 2009.
4. C. L. Doxiadis, Ekistics, 'An Introduction to the Science of Human Settlements', Hutchinson, London, 1968.

AR7902 LANDSCAPE DESIGN

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To introduce the various aspects of outdoor design and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.
- To familiarize students with the various elements of landscape architecture and the principle of landscape design.

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- To develop and strengthen the competence in dealing with the analytic, artistic and technical aspects of designing open spaces at different scales.
- To stress on the role of Landscape design in sustainability, to provide an overview of ecological balance and impacts of human activities and the need for environmental protection and landscape conservation.

UNIT I INTRODUCTION 07

Introduction to landscape architecture, Basic concepts of ecology and the impact of Human activities on them – Bio, Geo, chemical cycles including water cycle, carrying capacity of an ecosystem. Environmental impact assessment. Reclamation and restoration of derelict lands.

UNIT II ELEMENTS IN LANDSCAPE DESIGN 10

Hard and soft landscape elements; Hard landscape elements, Plant materials, Water and Landform - classification, characteristics, use and application in landscape design.

UNIT III GARDEN DESIGN 10

Landscape and garden design in Indian history – Gardens depicted in Sanskrit literature, Nandavanams and residential gardens of South India, Moghul gardens, public parks and residential gardens of the colonial period and contemporary public landscape projects. Study of notable examples, Spatial development in landscape design.

UNIT IV SITE PLANNING 10

Organisation of spaces in the outdoor environment – Role of circulation and built form in shaping the environment. Role of Landscape design in design of neighbourhood parks, children's play area and campus development.

UNIT V LANDSCAPING OF FUNCTIONAL AREAS 08

Urban open spaces and principle of urban landscape; Street landscaping, landscape design for waterfront areas and functional areas in urban centers. Green infrastructure including green roofs and walls.

TOTAL: 45 PERIODS

OUTCOMES:

- Understanding of the role of landscape design in the shaping of outdoor environments.
- Knowledge about the elements of Landscape design and their scope.
- Exposure to various typologies of Landscape design.
- Knowledge about the evolution of Indian gardens.

TEXTBOOKS:

1. Motloch, J.L., An Introduction to Landscape Design, US: John Wiley and sons, 2001.
2. Michael Laurie, Introduction to Landscape Architecture, Elsevier, 1986.
3. Sauter D; Landscape Construction; Delmar Publishers; 2000.

REFERENCES:

1. T S S for Landscape Architecture, McGraw Hill, Inc, 1995.
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993.
3. Albert J. Rutledge, Anatomy of a Park, McGraw-Hill Book company, 1971.
4. Richard P. Dober, Campus Landscape, John Wiley and Sons; 2000.
5. Strom Steven, Site engineering for landscape Architects, John Wiley and sons Inc., 2004.
6. Brian Hacket, Planting Design, Mc Graw Hill, Inc, 1976.
7. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers, Calcutta, 1991.
8. Rahoul B Singh, Gardens of Delight- Indian gardens through the ages, Lustre Press, Roli books, 2008.

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AR7903	URBAN HOUSING	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To outline the Issues concerning housing in the Indian Context and the various agencies involved in the production of housing.
- To outline factors that influence housing affordability and to familiarize students with various schemes and policies of the government in the housing sector.
- To inform about the standards and guidelines for housing.
- To inform about the various housing design typologies and the processes involves in housing project development.

UNIT I INTRODUCTION TO HOUSING AND HOUSING ISSUES – INDIAN CONTEXT 08

Housing and its importance in Architecture and its relationship with neighborhood and city planning. Housing demand and supply – National Housing Policy – Housing agencies and their role in housing development – impact of traditional life style – Rural Housing, Public, private sector housing.

UNIT II SOCIO-ECONOMIC ASPECTS AND LOW-INCOME HOUSING AND HOUSING DEVELOPMENT 13

Economics of housing; housing demand and supply; quantifying and estimating housing need; housing process and housing adjustment; formal and informal sector provision of housing; legislation for housing development, slum housing and re-development, sites and services, low-cost housing- case studies in India and developing countries. Housing affordability- Cost-effective materials and technologies for housing.

UNIT III HOUSING STANDARDS 06

URP – guidelines, CCA, EIA, stipulated by NIUA, model inclusive zoning, DCR, CRZ rules for Indian cities, housing density, street classification and standards; housing standards for EWS, LIG, MIG and HIG and facilities programming for housing and housing development.

UNIT IV SITE PLANNING AND HOUSING DESIGN 10

Site Planning and green building practices: Selection of site for housing, consideration of physical characteristics of site, location factors, orientation, climate, topography – Landscaping- Housing design – Traditional housing, row housing, cluster housing – apartments and high-rise housing relating to Indian situations – case studies in India – integration all types of services, parking, concepts relating to housing and housing developments and incorporation of green building and sustainable practices in Indian and International context –prefabrication in housing.

UNIT V COMMUNITY ARCHITCTURE AND DISASTER RESISTANT HOUSING 08

Community architecture movement and housing developments, community participation and housing management – Environmental aspects and natural calamities; planning and design for cyclone, landslide, earthquake and disaster mitigation.

TOTAL: 45 PERIODS

OUTCOMES:

- The course is devised to learn various issues concerning housing & housing development in Indian & International context covering a cross section of income groups.
- The students also will appreciate socio-economic aspects in housing, housing standards, site planning principles, various housing concepts, sustainable green building practices and measures to be taken for disaster mitigation.

TEXTBOOKS:

1. Christopher Alexander, A pattern Language, Oxford University press, New York 1977.
2. Leuris (S), Front to back: A Design Agenda for Urban Housing, Architectural Press, 2006.

REFERENCES:

1. Richard Kintermann and Robert small site planning for cluster Housing Van Nostrand Reinhold company, Jondon/New York 1977.

2. Joseph de Chiara and others – Time Saver Standards for Housing and Residential development, McGraw Hill Co, New York 1995.
3. Forbes Davidson and Geoff Payne, Urban projects Manual. Liverpool University press, Liverpool 1983.
4. HUDCO publications – Housing for low income, sector model.
5. Sustainable Building Design Manual: Vol 1 and 2,published by The Energy Research Institute, 2004.

AR7911 ARCHITECTURAL DESIGN VII

L	T	P/S	C
0	0	16	8

OBJECTIVES:

- To understand the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning.
- To understand the various components and aspects of the urban environment as well as their interrelationships.
- To understand in particular aspects such as public spaces, physical infrastructure, socio - cultural aspects such as heritage, gender, class, dynamics of urban growth.
- To take design decisions in a comprehensive manner understanding their implications in the larger context.
- To value ideas and opinions of others in society by engaging in collaborative study and design projects in the urban context and making design more inclusive.

CONTENT:

Scale and Complexity: projects involving the urban context and architecture in the urban context with a thrust on understanding interdependencies and formulating appropriate design directions.

Areas of focus/ issues: exploration of relationship between building and larger context addressing issues in urban areas – transportation, sustainability, heritage, sprawl, place making, identity, collective memory Mixed use programming.

Typology/ project: large scale urban interventions and projects with impact on the urban context- revitalization and renewal of urban fragments, evolving guidelines for heritage areas, adaptive reuse, urban waterfront development, transportation nodes, new communities, urban nodes, multi-use urban complexes.

TOTAL: 240 PERIODS

OUTCOMES:

- The students will be able to perceive and design buildings as part of the urban fabric, which could either be contextual or contrasting. They will develop ability towards making architecture inclusive, both in ideation and in response from society.

TEXTBOOKS:

1. Jonathan Barnett, An Introduction to Urban Design, Harper and Row; 1982
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999.
3. Jan Gehl, Life between Buildings- Using Public Space, Arkitektens Forleg 1987.
4. Time Savers Standard for Urban Design, Donald Watson, McGraw Hill, 2005.
5. Malcolm Moore & Jon Rowland Eds, Urban Design Futures, Routledge, 2006.

REFERENCES:

1. Edmund Bacon, Design of Cities , Penguin, 1976.
2. Gordon Cullen, The Concise Townscape, The Architectural Press, 1978.
3. Lawrence Halprin, Cities, Reinhold Publishing Corporation, New York, 1964.
4. Gosling and Maitland, Urban Design, St. Martin's Press, 1984.
5. Kevin Lynch, Site Planning, MIT Press, Cambridge 1967.

Attested

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AR7091 **THESIS** **L T P/S C**
0 0 36 18

OBJECTIVES:

- All the architectural design courses offered since semester II culminate in the thesis Project to motivate students to involve in individual research and methodology. This is to train them in handling projects independently.

TOPICS OF STUDY The main areas of study and research can include advanced architectural design, including contemporary design processes, urban design including urban-infill, environmental design, conservation and heritage precincts, housing etc. However, the specific thrust should be architectural design of built environment. Preparation of presentation drawings, working drawings, detailed drawings and study model are part of the requirements for submission.

METHOD OF SUBMISSION The Thesis Project shall be submitted in the form of drawings, project report, models, slides, CDs and reports.

TOTAL: 540 PERIODS

OUTCOMES:

- A comprehensive understanding of handling a major architectural project independently.

TEXTBOOKS:

1. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002.

REFERENCES:

1. Donald Appleyard, The Conservation of European Cities, M.I.T. Press, Massachusetts, 1979.
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999.
3. Richard Kintermann and Robert small site planning for cluster Housing; Van Nostrand Reinhold company, London/New York 1977.
4. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB) 2004.
5. Kevin Lynch - Site planning - MIT Press, Cambridge, MA - 1967.
6. Geoffrey And Susan Jellico, The Landscape of Man, Thames And Hudson, 1987.
7. Arvind Krishnan & Others, Climate Responsive Architecture, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2007.

AR7001 **ADVANCED STRUCTURES** **L T P/S C**
3 0 0 3

OBJECTIVES:

- To understand the behavior of structural systems for tall buildings and to design them for different types of loadings.
- To study the different types of tensile structures and their applicability.
- To learn the different industrial structures and their merits.
- To study the different types of shells.
- To study the different types of domes, folded plates and grids and their applications.

UNIT I TALL BUILDINGS **10**

Load action in high rise buildings- structural systems for tall buildings - Brief outline of their behaviour and their applicability for various heights of buildings - Approximate analysis and design of frames for gravity and lateral loadings.

UNIT II TENSILE STRUCTURES **06**

Concepts, Development ,Laws of formation, Merits and demerits of Pneumatic Structures - Basic principles ,various forms, Merits and Demerits of cable structures.

UNIT III INDUSTRIAL STRUCTURES 10

Classification - Planning and layout requirements, Functional requirements - Types of power plants - Bunkers and Silos, Cooling Towers, Containment structures - Transmission line towers - Chimneys - Merits.

UNIT IV SHELLS 09

Shells of translation - Shells of revolution - Cylindrical barrel vaults - Multiple barrels - Corrugated curves, Northlight shells - Butterfly shells - Intersection shells - Groined vaults - Warped surface - Conoidal shells - Hyperbolic parabolic shells - Umbrella shells - Trumpet shells - Their merits.

UNIT V DOMES AND FOLDED PLATES 10

Domes of revolution, spheres, translatory domes, multiple domes, Folded plate domes - Tapered elements, multifaceted Domes – Types – Classification as per BIS – Stress resultants – Relative merits and applicability. Folded plates – Types – Comparison with shells – Applicability. Arches – Basic concepts -grids- Definitions - various forms - Geodesic domes.

TOTAL: 45 PERIODS

OUTCOMES:

- Understanding of the types, nature and behaviour of more advanced and complicated structural systems which are gaining popularity in current scenario. After the completion of the course students will be able to visualize these systems and their applications in many modern day constructions and also try to include them in their design process.

TEXTBOOKS:

1. Thandavamoorthy T S. Advanced Structures of Architecture, Eswar Press,2008.
2. B.C. Punmia, Reinforced Concrete Structures, Vol. 1 & 2, - Laxmi Publications, New Delhi, 1994.
3. N. Subramanian, Principles of Space Structures – Wheeler and Co., Allahabad, 1983.
4. Milo.S.Ketchem and Mark.A. Ketchem, Types and Forms of Shell Structures, 1997.

REFERENCES:

1. Wolfgang Schueller – High Rise Building Structures, John Wiley & sons, New York 1976.
2. Frei Otto – Tensile structures Volume 1, Pneumatic structures, Volume 2, cable structures. The MIT press, London; 1966.
3. Bryan Stafford and Alex Coull -Tall Building structures – Analysis & Design- John Wiley; 1991.
4. Structural system for tall buildings – Council on tall buildings and urban habitat - McGraw Hill; 1995.
5. Thomas Herzog; Pneumatic structures,– Crosby Lockwood staples, London; 1976.
6. Bandyopadhyay .J.N, Thin Shell Structures Classical and Modern Analysis, New Age International Publishers, New Delhi, 1998.
7. Ramaswamy .G.S, Design of Construction of Concrete Shell Roofs, McGraw Hill Publishing Company, New York, 1986.
8. Taranath .B.S, Structural Analysis and Design of Tall Buildings, McGraw Hill, New York, 1988.
9. Henry.J.Cowan, Forrest Wilson, Structural Systems, Van Nostrand Reinhold Company, New York; 1981.
10. Mario Salvadori, Robert Heller, Structure in Architecture, Prentice International; 1982.
11. Henn.W., Buildings for Industry, Vol.I and II, London Hall Books, 1995.
12. SP 32 - 1986, Handbook on functional requirements of Industrial Buildings, Bureau of Indian Standards, 1990.

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AR7002	ARCHITECTURAL CONSERVATION	L	T	P/S	C
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OBJECTIVES:

- To introduce the various issues and practices of Conservation.
- To familiarize the students with the status of conservation in India and the various agencies involved in the field of conservation worldwide and their policies.
- To outline the status of conservation practice in the country and the various guidelines for the preservation, conservation and restoration of buildings.
- To inform the students about the character and issues in our heritage towns through case studies.

UNIT I INTRODUCTION TO CONSERVATION 12

Understanding Heritage. Defining Conservation, Preservation and Adaptive reuse. Heritage conservation- Need, Debate and purpose. History of Conservation movement. International agencies like ICCROM, ICOMOS, UNESCO and their role in Conservation- Charters. Principles and ethics of conservation.

UNIT II CONSERVATION IN INDIA 07

Museum conservation – monument conservation and the role of ASI, SDA, INTACH – Central and state government policies and legislations – inventories and projects- selected case studies of sites such as Hampi, Golconda, Mahabalipuram -craft Issues of conservation.

UNIT III CONSERVATION METHODS AND MATERIALS 10

Investigation techniques and tools- Behaviour of historic materials and structures- Problems with masonry, foundation- repair methods- traditional and modern methods- seismic retrofit and disabled access/ services additions to historic buildings- moisture and pollution problems.

UNIT IV CONSERVATION PRACTICE 07

Listing of monuments- documentation of historic structures- assessing architectural character – historic structure report- guidelines for preservation, rehabilitation and adaptive re-use of historic structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, heritage site management.

UNIT V URBAN CONSERVATION AND CONSERVATION PLANNING 09

Understanding the character and issues of historic towns, selected case studies, historic districts and heritage precincts, Conservation as a planning tool.- financial incentives and planning tools such as TDR- urban conservation and heritage tourism- case studies of sites like Cochin, Pondicherry French town- conservation project management.

TOTAL: 45 PERIODS

OUTCOMES:

- The student understands importance of heritage, issues and practices of conservation through case studies.
- The student will gain understanding on historic materials and their properties various technologies for investigating masonry, foundation and also traditional and modern repair methods.

TEXTBOOKS:

1. Bernard Fielden; Conservation Manual, INTACH Publication.
2. MS Mathews; Conservation Engineering, Universitat Karlsruhe; 1998.
3. J. Kirk Irwin, Historic Preservation Handbook, McGraw Hill 2003.
4. The Conservation of European Cities, Donald Appleyard, M.I.T. Press, Massachusetts, 1979.

REFERENCES:

1. James M. Fitch, Historic Preservation: Curatorial Management of the Built World by University Press of Virginia; Reprint edition (April 1, 1990).
2. Robert E. Stipe; A Richer Heritage: Historic Preservation in the Twenty-First Century.
3. B.K. Singh, State and Culture, Oxford, New Delhi.

4. A.G. K. Memon ed. Conservation of Immovable Sites, INTACH Publication, N. Delhi.
5. John H. Stubbs and Emily G Makas; Architectural Conservation in Europe and the Americas- John Wiley & Sons, Inc, 2011.

AR7003 ARCHITECTURAL JOURNALISM

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To provide basic introduction to the skills relevant to the practice of professional journalism. It introduces students to the fundamentals of writing, explaining of various strategies and their criticism.
- Introduction to Photojournalism and the contributions of photography to the professional practice of architecture and develop proficiency in this art using modern photography techniques.

UNIT I INTRODUCTION 09

Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism. Issues such as copyright, public art policy, the arts and urban redevelopment. Introduction to local culture scene.

UNIT II TECHNOLOGIES IN JOURNALS 09

Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT III CONTEMPORARY ARCHITECTURAL JOURNALISM 09

Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Multimedia/online journalism and digital developments.

UNIT IV DISCUSSIONS AND ISSUES 09

Regional, National and International discussion forums, Changes in contemporary and historical design practices. Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists, Public Discourse on the Internet, Mass Media and Public Opinion – critique on selected pieces of journalism.

UNIT V ARCHITECTURAL PHOTOGRAPHY 09

Introduction to architectural photography and role of the photographic image in the global world – basic instruction in Photojournalism Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale– photo- finishing and editing digital images. Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions – Lighting: External and Interior.

TOTAL: 45 PERIODS

OUTCOMES:

- An ability to critically think and analyze about the effects of architecture on society as well as the tools to enable recording of the same.

TEXTBOOKS:

1. Edward Jay Friedlander and John Lee Feature; Writing for Newspapers and Magazines, 4th edition, Longman. (2000).
2. Fuller, David & Waugh, Patricia eds. The Arts and Sciences of Criticism, Oxford: Oxford University Press (1999).

3. Foust, James, Online Journalism - Principles and Practices of News for the Web, Holcomb Hathaway Publishers, Scottsdale, AZ. (2005).
4. M. Harris; Professional Architectural Photography; Focal Press; 2001.
5. M. Harris; Professional Interior Photography; Focal Press; 2002.

REFERENCES:

1. American Institute of Timber Construction (AITC), Timber Construction Manual, Wiley Publishers, 2004.
2. Francis D.K Ching Building Construction illustrated, John Willey & Sons, 2008.
3. Wills H Wagner, Howard Bud, Modern Carpentry, Good Heart – Wilcox publishers, Portland, 2003.
4. Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005.

AR7004 ART APPRECIATION

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To introduce the vocabulary of art and the principles.
- To inform students about the various art forms through the ages within the cultural contexts.
- To study Modern Art and the new directions that evolved in the 19th and 20th centuries.
- To inform the production of art in the Indian context through history and the contemporary manifestations.

UNIT I INTRODUCTION TO ART 06

Definition of art - need for art – role of art – art reality, perception, representation- categories of art in terms of media and technique - appreciating art: form, content and context.

UNIT II VOCABULARY OF ART 09

Introducing the vocabulary of art constituted by elements (line, shape, form, space, colour, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement).

UNIT III APPRECIATING ART – BEGINNINGS TO MODERN ART 10

Appreciating art through the study of art production in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be studied and analysed in terms of their form, content and context. Prehistoric Art - Egyptian and Mesopotamian art Greek and Roman art– Medieval art - Renaissance and Baroque art - Neoclassicism - Romanticism - Realism.

UNIT IV APPRECIATING ART- MODERN ART AND AFTER 10

Appreciating art through the study of art production in the West over history from modern art till the present. Important works from the following art traditions will be studied and analysed in terms of their form, content and context: Context for new directions in art in the late 19th and early 20th century - Impressionism - post Impressionism – Fauvism - Expressionism - Cubism – Dadaism – Surrealism - abstract art – Futurism - Constructivism – Suprematism - De Stijl - Abstract Expressionism - Pop art - Op art- new forms and media of art.

UNIT V APPRECIATING ART- INDIAN ART 10

Appreciating art through the study of art production in India over history. Important works from the following art traditions will be studied and analysed in terms of their form, content and context. Indus Valley Art - Hindu Buddhist and Jain art - Mughal and Rajput miniatures - art during the colonial period - modern Indian Art.

TOTAL: 45 PERIODS

OUTCOMES:

- Students are able to appreciate the art forms and analyse the same and resizing the concept.
- Gathered information across the world art and the use of art in architecture and its use in their architecture profession.

- Gathered, sound knowledge on how art can be effectively used in to architecture and Interior Design.

TEXTBOOKS:

1. Fred, S. Kleiner, Gardener's Art through Ages, Harcourt College Publishers, 2001.
2. Bernard S. Myers, Understanding the Arts, Holt Rinehart and Winston Inc, 1964.
3. H.H. Arnason, History of Modern Art, Thames and Hudson, 1977.

REFERENCES:

1. The Penguin Dictionary of Art and Artists - Peter and Linda Murray - Penguin books 1989.
2. E.H. Gombrich, The Story of Art, Phaidon 2002.
3. E.H. Gombrich, Art and Illusion, Phaidon, 2002.
4. Indian Art since the early 1940s- A Search for Identity- Artists Handicrafts Association of Cholamandal Artists Village, Madras,1974.
5. A.K.Coomaraswamy, Fundamentals of Indian Art, Historical Research Documentation Programme, Jaipur, 1985.

AR7005	BUILDING INFORMATION MODELING	L	T	P/S	C
		0	0	6	3

OBJECTIVES:

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

UNIT I INTRODUCTION TO THE FUNDAMENTALS 15

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

UNIT II ADVANCED MODELING – FAMILY TYPES AND TOPO SURFACE MODELLING 20

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

UNIT III RENDERING AND MATERIAL APPLICATION 20

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

UNIT IV BIM FOR BUILDING ENERGY SIMULATION 30

Energy simulation for conceptual BIM models using massing- Detailed modeling using design elements- Rapid energy modeling and simulation with software. Conceptual Energy Analysis features to simulate performance. To produce energy consumption, carbon neutrality and renewable potential reports.

UNIT V BIM FOR COST ESTIMATING, PROJECT PHASING AND ADMINISTRATION 05

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

TOTAL: 90 PERIODS

OUTCOMES:

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

REFERENCES:

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

AR7006	CONSTRUCTION AND PROJECT MANAGEMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To understand different management techniques suitable for DESIGN and BUILD projects.
- To understand the management system for accomplishing SCOPE, QUALITY, TIME & COST.

UNIT I INTRODUCTION TO PROJECT MANAGEMENT 06

Project management concepts–objectives& scope, planning /monitoring & control, scheduling / Quality& cost. Traditional management system. Development of bar chart, CPM networks-Merits and Demerits, PERT network, introduction to the theory of probability and statistics.

UNIT II PROJECT PROGRAMMING AND CRITICAL PATH METHOD 10

Project Network-Events Activity, Dummy, Network Rules, Graphical Guidelines for Network, 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.

UNIT III COMPUTERIZED PROJECT MANAGEMENT 15

Introduction: Creating a New project, building task. Creating resources and assisting costs, Refining your project. Project Tracking-Understanding tracking, recording actual. Reporting on progress. Analyzing financial progress.

UNIT IV RESOURCE PLANNING 06

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 V CONCEPT TO COMMISSIONING 08

Project Feasibility study, Real estate & regulatory strategies, Facility Programming & Planning, Design management, EPC, Testing & commissioning.

TOTAL: 45 PERIODS

OUTCOMES:

- Ability to understand a project from concept to commissioning, feasibility study & facility program, design, construction to commissioning.
- Apply project management techniques in achieving objectives of a project like client needs, quality, time & cost.
- Understand principles of management, construction scheduling, scope definition and team roles.

Attested

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TEXTBOOKS:

1. Dr. B.C. Punmia and K.K. Khandelwal-Project planning and control with PERT/CPM, Laxmi publications, New Delhi, 1987.
2. Elaine Marmel, Microsoft office Project 2003 Bible, Wiley Dreamtect (P) Ltd., New Delhi, 2004.
3. Sam Kubba Green Construction Project Management and Cost Oversight, Elsevier, 2010.

REFERENCES:

1. S.P. Mukhopadyay, Project Management for architects and Civil Engineers, IIT, Kharagpur 1974.
2. Jerome D. Wiest and Ferdinand K. Levy, A Management guide to PERT/CPM, Prentice Hall of Indian pub. Ltd. New Delhi 1982.
3. SR.A. Burgess and G. White, building production and project management, the construction press, London 1979.

AR7007	CONSTRUCTION TECHNOLOGY	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To study the advancements in construction with concrete for large span structures.
- To familiarize the students with the manufacture, storage and transportation of concrete.
- To inform the various equipment used in the construction industry and the criteria for choice of equipment.
- To familiarize the students with an overview of construction planning and scheduling.

UNIT I GENERAL BUILDING REQUIREMENTS 07

NBC -Definitions –Development regulations - Classification of buildings- Requirements of parts of buildings.

UNIT II CONSTRUCTION SYSTEMS 12

Structural systems and design- Planning - pre-stressed concrete constructions - pre-cast concrete and pre- fabrication system - Modular coordination.

UNIT III CONSTRUCTION PRACTICE 12

Modern Construction Materials - Manufacture, storage, transportation and erection of pre-cast component forms- Types of moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

UNIT IV CONSTRUCTION METHODS AND EQUIPMENT 08

Use of equipments for construction and related activities-Ready mix concrete plant- Choice of construction equipment for different types of works.

UNIT V CONSTRUCTION TECHNOLOGY FOR HIGHRISE BUILDINGS 06

Planning and scheduling for high rise building- Scheduling- Simulation – Typical Floor Construction Cycle – Appropriate working schedule.

TOTAL: 45 PERIODS

OUTCOMES:

- Apply the concepts for large span structures.
- Concepts of construction management, planning and scheduling: apply them with examples.
- Materials storage and equipments for construction to be known before beginning of the work.

TEXTBOOKS:

1. R. Chudley, Construction Technology, Longman Group Limited, England, 1985
2. R. Barry, The Construction of Buildings, The English Language Book Society and Crosby Lockwood, Staples, London, 1976.

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REFERENCES:

1. National Building Code of India, 1983.
2. Frank R. Dagostino, Materials of Construction – Details given Reston Publishing Company, nc.Virginia, 1976.
3. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983.
4. http://www.tn.gov.in/tcp/acts_rules.htm
5. http://www.cmdachennai.gov.in

AR7008	CONTEMPORARY BUILDING MATERIALS	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To introduce and to know the categories of new materials currently used in any building site and also the modern products used in architecture, building and finishing (eco – friendly, composite, durable, advanced, smart).
- To inform the innovations in the materials used in Building Industry and the accepted industrial practices involved.
- To inform the properties, characteristics and application of materials in the construction industry. The primary focus is on materials and systems, their properties and connections, and their intrinsic relationship to structural systems and environmental performance.

UNIT I INDROTUCTION 05

Introduction and the needs fir ultra-performance materials in building design- as a substitute to conventional materials, newer application for special performance ,thermal/sound /moisture protection , fitting, equipment and furnishing .the properties of the contemporary materials – multidimensional , repurposed ,recombinant ,intelligent , interfacial, transformant etc.

UNIT II ADVANCED CONCRETE AND COMPOSITE REINFORCEMENT 10

The types of advanced concrete and its applications-workability and mechanical properties, durability and reliability of the advanced concrete materials –manufacturing and application in buildings - bendable concrete, light transmitting concrete, translucent concrete, pervious concrete ,eco-cement etc. Introduction manufacture types of reinforcement materials, properties and performance in concrete reinforcement - Aramid fibers, bio-steel, Carbon (Graphite) Fibers and fibre glass etc.

UNIT III COMPOSITE MATERIALS 10

Types, terminology and classification of materials ,composite of materials based on particle reinforced , fiber reinforced and structural and composite benefit in building construction .Composite materials manufacturing process. Use of composite materials namely Polymer Matrix Composites (PMCs), Fiber- Reinforced Polymers (FRPs) along with cement, steel, aluminum ,wood, glass , for thermal insulation , fire protection, coating and painting and structural monitoring etc.

UNIT IV NANO-MATERIALS AND NANO-COMPOSITES 10

Introduction–definition, manufacture types of Nano materials .Properties ,performance of the Nano materials in building construction , types and application of Nano- materials like carbon –nanotubes etc and Nano composite used with cement , steel, aluminum , wood, glass , for thermal insulation , fire protection, coating and painting and structural monitoring etc. - Nano technologies in building and construction.

UNIT V DIGITAL AND TENSILE MATERIALS 10

Types of materials and its constitution –manufacturing and construction technology and requirement for 3D printed buildings structure and Extraterrestrial printed structures. Tensile fabric structure by digital printing - translucent fabric, thin-film photovoltaics, texlon foil, PVC (poly vinyl chloride) coated polyester cloth and PTFE (poly tetra fluro ethlene) (teflon) coated glass cloth.

TOTAL: 45 PERIODS

OUTCOMES:

- Students are sensitized to the need and use of various contemporary materials in the context of creating innovative and ultra-performance in building design using contemporary materials.
- The performance and characteristics of the newer material in terms of detaining and application to the context.

TEXTBOOKS:

1. Sauer, Christiane: Made of --: new materials sourcebook for architecture and design, Publisher: Gestalten, 2010.
2. Schwart, Mel: Encyclopedia of smart materials, Vol 1,2, Publisher: Wiley-Interscience, 2001.
3. Şensan, Senem Özgönül: Smart Materials and Sustainability: Application of Smart Materials in Sustainable Architecture, Publisher: LAP Lambert Academic Publishing, 2010.
4. Ritter, Axel: Smart Materials in Architecture, Interior Architecture and Design, Publisher: Birkhäuser Architecture, 2002.

REFERENCES:

1. Addington, Michelle; Schodek, Daniel L.: Smart materials and new technologies: for the architecture And design professions, Publisher: Architectural Press, 2005.
2. Ashby, M. F.; Ferreira, Paulo J. S. G.; Schodek, Daniel L.: Nanomaterials, Nanotechnologies and Design: An Introduction for Engineers and Architects, Publisher: Butterworth-Heinemann,2009.
3. Brownell, Blaine: Transmaterial 2, Publisher: Princeton Architectural Press, 2008.
4. Bujoreanu L.Gh.: Materiale Inteligente, Publisher: Junimea, Iasi, 2002.
5. Fernandez, John: Material Architecture: Emergent Materials for Innovative Buildings and Ecological Construction, Publisher: Taylor & Francis, 2006.
6. Hardt, Dorian: Materiale pentru construcţii si finisaje, Publisher: UAUIM, 1996.
7. Ispas, St.: Materiale Compozite , Publisher: ETP, Bucuresti, 1987.
8. Popescu, Nicolae; Batalu, Dan: Introducere în ştiinţa materialelor, Elemente de teoria Ştiinţei Materialelor, Publisher: Politehnica Press, 2000.

AR7009	CONTEMPORARY PROCESSES IN ARCHITECTURAL DESIGN	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To investigate various theories of media and its influence on the perception of space – Virtual Reality – Augmented Reality.
- To study the various aspects of Digital Architecture and its exploration through emerging phenomena that relies on abstraction of ideas.
- To study the works of contemporary architects who have illustrated the influence of the digital media in evolving architecture. This is to be presented as Seminars.

UNIT I INTRODUCTION 06

Investigation of contemporary theories of media and their influence on the perception of space and architecture. Technology and Art – Technology and Architecture – Digital Technology and Architecture.

UNIT II ASPECT OF DIGITAL ARCHITECTURE 09

Aspects of Digital Architecture – Design and Computation – Difference between Digital Process and Non-Digital Process – Architecture and Cyber Space – Qualities of the new space – Issues of Aesthetics and Authorship of Design – Increased Automatism and its influence.

UNIT III CONTEMPORARY PROCESS 10

Emerging phenomena such as increasing formal and functional abstractions – Diagrams – Diagrammatic Reasoning – Diagrams and Design Process – Animation and Design – Digital Hybrid.

UNIT IV GEOMETRIES AND SURFACES 10

Fractal Geometry –- Shape Grammar - Hyper Surface - Liquid Architecture – Responsive Architecture.

UNIT V SEMINAR 10

Students would make presentation on the ideas and works of the following architects. The proposal must be discussed with course faculty prior to presentation. Greg Lynn, Reiser + Umemotto, Lars Spuybroek / NOX Architects, UN studio, Diller Scofidio, Dominique Perrault, Decoi, Marcos Novak, Foreign Office Architects, Asymptote, Herzog and de Meuron, Neil Denari, Serie Architects, BIG Architects.

TOTAL: 45 PERIODS

OUTCOMES:

- Students would be able understand the effect of contemporary theories of media on contemporary architectural design.
- Student shall gain insight to the various contemporary design process/theories and their relation to computation.
- Students would be able to identify and go in depth into specific and appropriate aspects. relating to the discipline of architecture and reflect this in the realm of design.

TEXTBOOKS:

1. Walter Benjamin, Practices of Art in the Age of Mechanical Reproduction, in illumination, Colin press, 1977.
2. Work of Architecture in the Age of Mechanical Reproduction, Differences MIT press,1997.
3. William J Mitchell, the Logic of Architecture: Design, Computation and Cognition. MIT Press, Cambridge, 1995.
4. Ali Rahim, Contemporary Process in Architecture, John Wiley & Sons, 2000.
5. Contemporary Techniques in Architecture, Halsted Press, 2002.
6. Peter Eisenmann; Diagram Diaries ; Universe; 1999.
7. Grey Lynn, The Folded, The Pliant and The Supple, Animate form; Princeton Arch. Press; 1999.

REFERENCES:

1. Gillian Hunt, Architecture in the Cyberspace II, John Wiley & Sons; 2001.
2. L. Convey et. al. Virtual Architecture, Batsford, 1995.
3. Rob Shields (ed.) Cultures of the internet: Virtual Spaces, Real Histories, Living bodies, Sage, London; 1996.
4. John Beckman, The Virtual Dimension, Architecture, Representation and Crash Culture, Princeton Architecture Press, 1998.
5. William J Mitchell, City of bits: Space, Place and the Infobahn. MIT Press, Cambridge, 1995.
6. Marcos Novak, invisible Architecture: An Installation for the Greek Pavilion, Venice Biennale, 2000.

AR7010 DIGITAL ART

L	T	P/S	C
1	0	4	3

OBJECTIVES:

- Through a project the student is taught video, image and vector editing using editing software.
- To enable the creation of interactive patterns by introducing scripting.
- To enable synchronization of sound with patterns generated.
- To enable presentation using voice over and production of CD roms.

UNIT I VIDEO EDITING, IMAGE EDITING & VECTOR EDITING 15

Tools: Importing avis and mpegs, sequencing, cutting trimming, decrease and increase the speed of the movie, filters, transitions, output settings, saving the output with the help of video editing software. Image editing (pixel image types) using tools, Vector characters, bizer and grip editing, transform, fill types, text formatting, colour overlays, etc.

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UNIT II OVERLAPPING TECHNIQUE (2D ANIMATION WITH MOVIE) 20

Project: Import Movie file in the editing software and overlap the 2D Animation film creation. Synchronize the sound and create a perfect blend of AVI and 2D Animation film.

UNIT III PATTERNS THROUGH SCRIPTING 15

Project: Create 2d interactive patterns using basic scripting. Through this scripting tools will be taught.

Tools: Scripting in software could be explored.

UNIT IV DESIGN GENERATION USING SOUND 10

Project: Create forms/ patterns synchronized to sound file, through this relationship between sound and forms/ patterns will be explored.

Tools: related software could be explored.

UNIT V SPACE GENERATION 15

Project: Students would identify a metaphor (literature, movies, and music albums) and create spaces using the same. The proposal must be discussed with course faculty prior to presentation.

Tools: Importing files using standard and linking options. Using scripts and behaviors, understanding stage, cast and time line, using cast library, Tweening, using swf movie, presentation using voice over and presentation demos, creating auto run cd- roms.

TOTAL: 75 PERIODS

OUTCOMES:

- The student has sufficient knowledge to edit video and image using editing software.
- The student can synchronize sound with patterns generated.
- The student can make presentation using voice over.

TEXTBOOKS:

1. Adobe Creative Cloud (2015 release): Books, eBooks, and Video ... http://www.peachpit.com/promotions/adobe-creative-cloud-2015-release-books-ebooks-and-140688.
2. Photoshop 7 Bible Professional Edition, Wiley John & Son INC, New York, Deke McClelland.
3. Flash Web Design, The Art of Motion Graph, Curtis Hillman, New Riders Publishing, Indianapolis, IN. U.S.A, 2000.

REFERENCES:

1. M.E. Morris, and R.J. Hinrichs, Web Page Design, Prentice Hall, 1996.
2. Mark Von Wodtke, Mind over Media: Creative Thinking Skills for Electronic Media, McGraw-hill, New York, 1993.
3. The New Media Reader, edited by Noah Wardrip-Fruin and Nick Montfort, MIT Press, ISBN 0-262-23227-8 or 978-0-262-23227-2.
4. Shaping Space by Zalanski and Fischer Art Fundamentals: Theory and Practice (Paperback) by Ocvirk, Stinson, Wigg, Bone and Cayton Launching the Imagination by Stewart Video Art, A Guided Tour by Elwes.
5. 3-D Human Modeling and Animation, Second Edition by Peter Ratner, April 18, 2003).
6. Animating with Flash MX: Professional Creative Animation Techniques by Alex Michael, focal press, 2002.
7. Maya Character animation, jaejin Choi, Dec 16, 2002.
8. 3D Modeling and Animation:: Synthesis and Analysis Techniques for the Human Body by Nikos Sarris and Michael G. Strintzis (Hardcover - Mar 22, 2005).

Attested

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AR7011 DISSERTATION

L	T	P/S	C
0	0	6	3

OBJECTIVES:

- To expose the students to the various thrust areas in architecture.
- To inculcate the spirit of research in architecture by providing opportunities to read on various issues.
- To expose the students to the finer details of technical writing.
- To provide a platform for a prelude to the 'Design Thesis'.

CONTENT:

Design studio emphasize on explaining and understanding Architecture primarily through the mode of making. Dissertation offers an opportunity to look at architecture, history and design primarily through textual. However, like design, dissertation involves process of observation, reflection and abstraction. Students are encouraged to choose any topic of their interest. They may range from analyzing the works of an architect, history, typological changes, writing, design process and many more. The dissertation should state its objectives, followed by exhaustive documentation and arguments. The emphasis however, could vary according to the topic. The dissertation proposal in about 1500 words stating the topic issues to be explored and the scope must be submitted. After approval the work would be periodically reviewed. A well written report of a minimum 15,000 words must be submitted in the prescribed format, if any provided by the University. The student would subsequently make a presentation of his/her work and defend them.

TOTAL: 90 PERIODS

OUTCOMES:

- A Dissertation book which is based on accepted norms of technical writing.
- An understanding leading to formation of thesis ideas.

TEXTBOOKS:

1. Iain Borden and Kaaterina Ruedi; The Dissertation: An Architecture Student's Handbook; Architectural Press; 2000.
2. Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons 2001.

REFERENCES:

1. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; The Craft of Research, 2nd Edition; University of Chicago Press; 2008.
2. Ranjith Kumar; Research Methodology- A step by step guide for beginners; Sage Publications; 2005.
3. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2002.

AR7012 EARTHQUAKE RESISTANT ARCHITECTURE

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To understand the fundamentals of Earthquake and the basic terminology.
- To inform the performance of ground and buildings.
- To familiarize the students with design codes and building configuration.
- To understand the various types of construction details to be adopted in a seismic prone area.
- To apply the knowledge gained in an architectural design assignment.

UNIT I FUNDAMENTALS OF EARTHQUAKES **07**

a) Earths structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.
b) Predictability, intensity and measurement of earthquake.
c) Basic terms- fault line, focus, epi- centre, focal depth etc.

UNIT II SITE PLANNING, PERFORMANCE OF GROUND AND BUILDINGS 08

a) Historical experience, site selection and development.
b) Earthquake effects on ground, soil rupture, liquefaction, landslides.
c) Behaviour of various types of building structures, equipments, lifelines, collapse patterns.
d) Behaviour of non-structural elements like services, fixtures in earthquake-prone zones.

UNIT III SEISMIC DESIGN CODES AND BUILDING CONFIGURATION 08

a) Seismic design code provisions – Introduction to Indian codes.
b) 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 VARIOUS TYPES OF CONSTRUCTION DETAILS 10

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 URBAN PLANNING AND DESIGN 12

a) Vulnerability of existing buildings, facilities planning, fires after earthquake, socio-economic impact after earthquakes.
b) Architectural design assignment- Institutional masonry building with horizontal spread and height restriction, multi-storeyed RC framed apartment or commercial building.

TOTAL: 45 PERIODS

OUTCOMES:

- To provide basic knowledge of earthquake resistant design concepts to students of Architecture, as it has become evident in recent years that some of the seismically active areas of the world are located within Indian and lives lost during past earthquakes due to damage of homes and other buildings are enormous.

TEXTBOOKS:

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 India; 2005.
3. Agarwal. P, Earthquake Resistant Design, Prentice Hall of India, 2006.

REFERENCES:

1. Ian Davis; Safe shelter within unsafe cities” Disaster vulnerability and rapid urbanisation, Open House International, UK; (1987).
2. Socio-economic developmental record- Vol.12, No.1, Jan-Feb 2005.
3. Learning from Practice- A review of Architectural design and construction experience after recent earthquakes- Joint USA-Italy workshop, Oct.18-23, Orvieto, Italy, 1992.

AR7013 ENERGY EFFICIENT ARCHITECTURE L T P/S C
3 0 0 3

OBJECTIVES:

- To inform the need to use alternative sources of energy in view of the depleting resources and climate change.
- To familiarise the students with simple and passive design considerations.
- To inform about the importance of day lighting and natural ventilation in building design.
- To make the students aware of the future trends in creating sustainable built environment.

UNIT I PASSIVE DESIGN 10

Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and Thermal Performance of Walls and Roofs.

UNIT II ADVANCED PASSIVE ARCHITECTURE- PASSIVE HEATING 10

Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain.

UNIT III PASSIVE COOLING 08

Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels.

UNIT IV DAY LIGHTING AND NATURAL VENTILATION 05

Daylight Factor - Daylight Analysis - Daylight and Shading Devices - Types of Ventilation - Ventilation and Building Design.

UNIT V CONTEMPORARY AND FUTURE TRENDS 12

Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials and the future of built environment, Energy Conservation Building code.

TOTAL: 45 PERIODS

OUTCOMES:

- The students are exposed to alternative sources of energy and are exposed to passive design considerations.
- An understanding on day lighting and natural ventilation in design in addition to the future trends in creating sustainable built environment.

TEXTBOOKS:

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999.
2. Arvind Krishnan & Others, " Climate Responsive Architecture", A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001.
3. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.
4. Givoni .B, "Passive and Low Energy Cooling of Buildings", Van Nostrand Reinhold, New York, 1994.

REFERENCES:

1. Fuller Moore, "Environmental Control Systems", McGraw Hill INC, New Delhi - 1993.
2. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, New York, 1996.
3. Patrick Waterfield, "The Energy Efficient Home: A Complete Guide", Crowood press ltd, 2011.
4. Dean Hawkes, "Energy Efficient Buildings: Architecture, Engineering and Environment", W.W. Norton & Company, 2002.
5. David Johnson, Scott Gibson, "Green from the Ground Up: Sustainable, Healthy and Energy efficient home construction", Taunton Press, 2008.

AR7014 ENTREPRENEURSHIP SKILLS FOR ARCHITECTS

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To learn how to start a business as an architect and to develop the creative and leadership skills for the same.
- To develop the confidence and skills in preparing business plans and to propose and sell ideas to potential clients and investors.
- To collaborate with students from other disciplines and mentors from both, University and Industry.

UNIT I INTRODUCTION TO ENTREPRENEURSHIP 06

Leadership - Creativity - Self - Motivation - Administration-Time Management - Marketing – Finance Management – People skills – Starting a business.

UNIT II STRATEGIC DESIGN AND INNOVATION 09

Application of future-oriented design principles to increase the design organization's innovative and competitive qualities - Re-definition of problems – user experience - rapid prototyping – multidisciplinary entrepreneurship skills – Case studies.

UNIT III SUSTAINABILITY 10

Risk-taking – financial, social and environmental risks – Job Procurement – Cash flow – Costing – Risk assessment - Employee management.

UNIT IV MARKETING 10

Branding - Social media - Advertising – Public Speaking – People management.

UNIT V SEMINAR 10

Talks and presentations by industry organizations – private, govt, ngo's.

Students would design and make presentations on a strategic business model for a design and innovation challenge in the context of the current design and social situation. Students can take up a challenge in collaboration with the industry.

TOTAL: 45 PERIODS

OUTCOMES:

- The student get sufficient knowledge to start a business as an architect and establish his office.
- The student develops enough confidence and skills to prepare business plans and to propose ideas to potential clients and investors.

TEXTBOOKS:

1. Jagat Trivedi, IIM: Insights Into Managing: A Must Read for Leaders, Managers, Aspiring Managers, Students, and Entrepreneurs, Outskirts Press, 2013.
2. Eric Reinholdt, Architect and Entrepreneur: A Field Guide to Building, Branding, and Marketing Your Startup, 30x40 Design Business. Design Workshop Press, 2015.
3. Dave Ramsey, Entre Leadership: 20 Years of Practical Business Wisdom from the Trenches, Howard Books, 2011.

REFERENCES:

1. Small Business Service. Social Enterprise Unit. Online. URL: http://www.dti.gov.uk/socialenterprise/index.htm, 2005.
2. Kiran Gandhi, 2012, Marketing for Architects – A Practical Guide, 2012.

AR7015	GLASS ARCHITECTURE AND DESIGN	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- This is an Industry based elective course to provide the students with the latest & recent trends in architecture.
- To understand the right selection and usage for right glass for appropriate purposes.
- To understand concepts on modern concepts on Glass Architecture, Role of Glass in Green design and concepts on considerations for improving the building performance using glass.

UNIT I GLASS – THE BUILDING MATERIAL 10

Evolution & importance of Glass in Modern Architecture- Applications of Glass in Buildings (façade/ interior applications)- Understanding the Production & properties of Glass- Value additions- Coating Technology: Importance & necessity, Processing: Concepts on Tempering, Heat Strengthening, DGU, Laminated, Ceramic Fritting; Different Types of Glass: Mirror, Lacquered, Fire Resistant & Modern Glass with different applications - Glass for segments- Hospitals, Green Homes, Airports, Offices, Other buildings - Understanding Glass & Human safety Compliances - Role of Glass in Fire Safety Considerations: Class E, EI & EW - Role of Glass in Acoustics - International Standards & Codal Provisions.

UNIT II GLASS AND GREEN ARCHITECTURE 10

Building Physics: Theory of electromagnetic radiation - Understanding of internal & external reflections - Day-lighting in Buildings: Introduction & basic concepts (VLT) - Solar Control and thermal Insulation (SF, UV, SHGC) - Need for Green Buildings: Energy efficient buildings - Benefits of going green - Achieving energy efficiency using glass - Factors of energy efficient material selection: Performance parameters - Energy codes and Green ratings: ECBC, IGBC, GRIHA; - Approaches of energy efficiency: Prescriptive method, Trade off method – Accommodating Passive architecture, Whole Building Simulation.

UNIT III CASE STUDY 10

Case study of Green Building Designed predominantly with energy efficient materials - Calculations involving basic factors in Glass Design - Optimization of Glass: For wastage reduction & standardization of Design - Construction Site/ Green Building Visit Report**.**

UNIT IV DESIGN STUDIO (WORKSHOPS) 15

Software Analysis : CREATE your building: Interactive Modeling - Find when it's HOT: Sun Path Analysis - Feel the WEATHER: Solar exposure Analysis - Know the ANGLES: Building Orientation Analysis - Simulate the NEIGHBORHOOD: Site Shadow Analysis - Accommodate COMFORT: Daylight Analysis and Acoustic analysis.

UNIT V DESIGN STUDIO (WORKSHOPS) 15

Check for SAFETY: Thickness analysis - Foresee how things LOOK: Colour and aesthetics - Money matters: WASTAGE optimization - AC load calculations and PAYBACK analysis – A comparative case study - Case studies and Expert views – Innovative, Next generation & advanced solutions of Glass.

TOTAL: 60 PERIODS

OUTCOMES:

- An understanding of current industry expectation with modern concepts of Architecture.
- Understanding the tools and software currently in practice in the field of architecture.

TEXTBOOKS / REFERENCES:

1. Federation of Safety Glass. (2013) Glass for buildings. Architectural Glass Guide.
2. Architectural Flat Glass Division of Saint Gobain. (2000). Glass Guide. Pg 2-7.
3. Indian Green Building Council. (2001). LEED 2011 For India-Green Building Rating System. Abridged Reference Guide.
4. CCPS: Part I, Part II, Part III, Part IV.
5. Bureau of Energy Efficiency. (2009). Energy Conservation Building Code. User Guide.
6. Bureau of Indian Standards. (1998). IS 875 (Part -3) Reaffirmed 1997. Code of Practice for Design loads.
7. Bureau of Indian Standards. (2013). IS 7883. Code of Practice for the Use of Glass in Buildings.
8. Glass Academy. Training Manuals & E- learning.
9. Christian Schittich, "Glass Construction Manual", Institut fur Internationale Architecktur Dokumentation GmbH & Co. KG, Munich, 2007.

AR7016 GRAPHIC AND PRODUCT DESIGN L T P/S C
1 0 4 3

OBJECTIVES:

- To understand the scope and nature of Graphic design as a discipline.
- To introduce the principle of a Graphic and their design applications.
- To understand the evolution of Form and Space in product design.
- To learn to interpret the design concepts in different ways and layers.

UNIT I INTRODUCTION TO GRAPHIC DESIGN 15

Graphic design – elements, principles and their applications. Paper sizes and formats, Folding and binding. Basics of Typography, Grid systems, Identity Design. Logo

design. Stationery design: Visiting cards, Envelope design, Letterhead design. Label designs for product packaging on paper and cardboards mock-ups. Design for Print media. Introduction to Printing processes: Gravure, Screen, Offset and Digital printing. Introduction to software packages for graphic design applications.

UNIT II INTRODUCTION TO PRODUCT DESIGN 10

Concept of Form and Space. Form elements and their properties - Volume, Plane, Line, Point. Form: Dimensions, Proportions, 3-D Primary Geometric Forms. Movement and Forces Relationships: Axis, Axial Movement, Forces, Curves and their application in Form. Study of Form relationships – Order, Joined Forms, Transitional Forms, Evolution of Form. Organization of form – Spatial, Matrix. Static, Dynamic and Organic. Symmetry and Asymmetry. Balance: Structural, Visual. Orientation of form: Direction, Position. Overall Proportion. Considerations of Colour, Pattern, Texture and Proportion in products and product environments. Relating Form to Materials and Processes of Manufacture. Use of Computers for Form generation.

UNIT III PRODUCT DESIGN 20

Selection of the projects is based on the possibility of user interaction leading to innovation. Projects end with a comprehensive presentation through working/mockup models, design drawing and a report. The project is supported by detailed discussion on various stages in the design process emphasizing the complementary nature of systematic and creative thinking. This is achieved by short supporting assignment in following topics: Creativity techniques like brain storming & synectics to develop creative attitude and open mind, design opportunity, problem perception , Idea Sketching ,clustering of ideas for concept development, exploratory mockup models for concept development, evaluation of concepts, final concept selection, concept development, refinement and detailing.

UNIT IV PRODUCT DETAILING 15

Batch production and mass production of products. Technical considerations of internal subsystems of a product and their influence on product detailing. Selection of natural, synthetic and manmade materials and their processes for detailing products for manufacture. Detailing mechanisms for foldable, stackable and collapsible considerations of the product. Design detailing of components vis-à-vis considerations of manufacture, maintenance and assembly. Detailing of products to be manufactured in Plastics. Component design of electronic products. Detailing for conditions of use including knock-down systems and its joinery. Usability and Ergonomic issues in product detailing. Design assignments on detailing of a given product component.

UNIT V PRODUCT DESIGN PROTOTYPING AND ADVANCED MANUFACTURING PROCESSES 15

Introduction to automation & Computer Aided Design (CAD), Principles of Basic Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). Hardware and graphics software in CAD. CAD applications and integration with other software packages. Evolution of Numerically Controlled (NC) machines and Computer Numerically Controlled (CNC) machines, programming of CNC machine. Free form or generative manufacturing processes (Rapid Prototyping). Working Principles of Rapid Prototyping machines. Types of Rapid Prototyping machines with technology employed. Rapid Tooling (RT): Soft tooling, Vacuum casting, Room temperature vulcanization (RTV). Input devices, Contact and non-contact type digitizers such as Co-ordinate measuring machines, Laser and White light scanners. Product Modeling using CAD software and Rapid Prototyping machine. Production using Rapid Tooling approach.

TOTAL: 75 PERIODS

OUTCOMES:

- The students will understand the role of Graphic and product design as a discipline, and its role in understanding and interpreting a real life design. Various reading methods were explored, to understand the contemporary design process as well as manufacturing process of design.

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REFERENCES:

Graphic design:

1. J. Bowers, Introduction to Two- Dimensional Design: Understanding Form and Function, John Wiley and Sons, 1999.
2. L. Holtzschue, Understanding Colour: An Introduction for Designer, 2nd Edition, John Wiley and Sons, 2002.
3. H.G Greet and R. Kostellow, Elements of Design and the Structure of Visual Relationships, Architectural Press, New York, 2002.
4. B. Gordon and M. Gordon, Complete Guide to Digital Graphic Design, Thames and Hudson,2002.
5. P. B. Meggs, Typographic Design: Form and Communication, John Wiley and Sons, 2000.
6. P. B. Meggs, Type and Image: The Language of Graphic Design, VNR, 1992 R.

Product design:

1. H. G. Greet and R. R. Kostellow, Elements of Design and the Structure of Visual Relationships, Architectural Press, NY, 2002.
2. K. Critchlow, Order in Space: A Design Source Book, Thames and Hudson, 1969.
3. C. Akner-Koler, Three-dimensional Visual Analysis, Institution for Industrial design, Konftfack, Sweden, 1994.
4. Practical Methods for the Systematic Development of New Products, Publisher: Chapman & Hall, 1995.
5. Roozenburg and Eekels, Product Design: Fundamentals and Methods, Publisher: John Wiley & Sons Inc; New Ed edition, 1995.
6. Goodrich, Kristina; Design Secrets: Products: 50 Real-Life Projects Uncovered - Industrial Designers Society of America, Publisher: Rockport Publishers June 2001.
7. Rouse, William B.; Design for Success: A Human-Centered Approach to Designing Successful Products and Systems, Publisher: Wiley-Interscience; 1991.
8. J.M. Gordon Jr., Industrial Design of Plastics Products, John Wiley and Sons, 2003.
9. G. Boothroyd, Product Design for Manufacture and Assembly, 2nd Edition, Marcel Dekker Inc., 2002.
10. J.W. Priest, S. M. Jose, Product Development for Manufacturing, Marcel Dekker Inc., 2001.

AR7017 HISTORY OF CONTEMPORARY ARCHITECTURE

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To introduce the context for the critiques of modern architecture and the evolution of new approaches.
- To study in detail the different post modern directions in architecture.
- To understand the trajectory of architecture in India from the end of colonial rule to the contemporary period- architectural debates associated with nation, establishment of modern architecture and subsequent quest for Indianess.

UNIT I CRITIQUING MODERNISM **09**

TEAM X- Brutalism- projects of Smithsons and Aldo Van Eyck – writings of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander.

UNIT II AFTER MODERNISM – I **10**

Conditions of Post Modernity- various postmodern directions in architecture– canonization of Post Modernism– works of Graves, Venturi, Moore- postmodern classicism- ideas and works of urbanism: Soleri, Archigram and Metabolism- Neo Rationalism.

UNIT III AFTER MODERNISM – II **07**

High Tech architecture: Works of Stirling, Rogers and Piano – De-constructivist theory and practice- Eisenmann, Hadid, Gehry, Libeskind, Tschumi.

UNIT IV ALTERNATIVE PRACTICES AND IDEAS **07**

Critical Regionalism - Ideas and works of Baker, Fathy, Ralph Erskine, Lucien Kroll, Ando, Bawa, Barragan, Siza.

UNIT V POST INDEPENDENT ARCHITECTURE IN INDIA 12

Architectural debates associated with nation formation– early modernist architecture- post independence city planning: Chandigarh and Bhubaneswar- influences on post-independence Architects- Architecture of Kanvinde, Raje, Doshi, Correa, Nari Gandhi, Raj Rewal- PWD architecture – new directions after 1960s- post- independent architecture of Chennai.

TOTAL: 45 PERIODS

OUTCOMES:

- The context for the critique of modern architecture and the evolution of new approaches were introduced. The different post modern directions in architecture were studied in detail. The trajectory of Architecture in post-colonial India was understood.

TEXTBOOKS:

1. Kenneth Frampton, "Modern Architecture: A Critical History", Thames & Hudson, London, 1994.
2. Diane Ghirardo , "Architecture after Modernism", Thames & Hudson, London, 1990.
3. Miki Desai et. al., "Architecture and independence", Oxford University Press, 2000.
4. Christopher Alexander, "Pattern Language", Oxford University Press, Oxford, 1977.
5. Robert Venturi , "Complexity and Contradiction in Architecture", 1977.

REFERENCES:

1. Michael Hays ed., "Architecture Theory" since 1968, CBA, 1999.
2. Jane Jacobs, "Deaths and Life of Great American Cities", Vintage, 2003.
3. Kenneth Frampton ed, "Charles Correa", The Perennial Press, 1998.
4. William Jr. Curtis, "Balkrishna Doshi, An Architecture for India", Rizzoli, 1988.

AR7018	INTERIOR DESIGN	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To introduce the vocabulary of interior design. To introduce the basics of measured drawing.
- To familiarize the students with an overview of interior and furniture design and design movements through history.
- To inform the various components of interior space and treatment and finishes for the same.
- To familiarize the students with the various components of interior design like lighting, Landscaping and furniture.
- To help students to understand way of analyzing furniture forms and designing furniture forms scientifically based on Ergonomics, materials design and working parameters.

UNIT I INTRODUCTION TO INTERIOR DESIGN 06

Definition and process of interior design - vocabulary of interior design in terms of principles and elements - introduction to the design of interior spaces as related to typology and function, themes and concepts.

UNIT II HISTORY OF INTERIOR AND FURNITURE DESIGN 09

Overview of interior and furniture design focusing from the time span of 17th century to current time span. Overview of folk arts and crafts of Indian sub-continent with reference to their role in interior decoration. Other geographical areas will include Europe and America, East and West Asia and Africa.

UNIT III MATERIALS AND FINISHES 10

Introduction to skills required, materials properties, bio-mechanical factors, agronomical considerations and aesthetic considerations. Treatment of components such as floors, ceilings, walls, partitions, window treatments, accessories, etc., in terms of their choice and design related to materials, methods of construction, colour, texture, etc., based on functional, aesthetic and psychological criteria.

UNIT IV LIGHTING AND LANDSCAPING 10

Psychological aspects of lighting and creating a mood or an ambience. Study of new trends in interior lighting with reference to creation of required ambience within the space. It will include the study of various lighting systems, their fixing details in addition to other related environmental issues. Introduction to the interior landscape elements (landform, water, vegetation, architectural elements). Understanding the visual (color, form, texture) / non-visual (smell, touch, sound) attributes of these elements and their usage and application in design. Integration of indoor and outdoor spaces.

UNIT V FURNITURE DESIGN 10

Introduction to anthropometry and ergonomics with reference to functionality. Furniture design as related to human comfort and function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas various systems and approaches to design – use of grid, modules etc. - furniture for specific types of interiors: office furniture, children's furniture, residential furniture, display systems, etc.

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding of interior design as an interdisciplinary as well as allied field related to Architecture.

TEXTBOOKS:

1. Francis D.K.Ching, "Interior Design Illustrated", V.N.R. Pub. NY 1987.
2. Joseph DeChiara, Julius Panero, Martin Zelnik, "Time Saver's Standards for Interior Design", McGraw-Hill Professional 2001.
3. John F. Pile, "Interior Design", John Wiley and Sons 2004.
4. Dr. Saranya Doshi, Editor, "The Impulse to adorn - Studies in traditional Indian Architecture", Marg Publications 1982.
5. Steport - De - Van Kness, Logan and Szebely, "Introduction to Interior Design", Macmillan Publishing Co NY 1980.
6. Aronson (J); The Encyclopedia of Furniture –Potter Style; 1965.

REFERENCES:

1. Helen Marie Evans, "An Invitation to design", Macmillan Pub Co 1982.
2. Julius Penero and Martin Zelnik, "Human Dimensions and Interior space", Whitney Library of Design NY 1979.
3. " Inca-Interior Design Register", Inca Publications, Chennai 1989.
4. Kathryn B. Hiesinger and George H. Marcus, Landmarks of twentieth Century Design; Abbey Ville Press 1993.
5. Susanne Slesin and Stafford Cliff, Indian Style, Clarkson N. Potter, New York 1990.

AR7019	REAL ESTATE DEVELOPMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

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

UNIT I REAL ESTATE FUNDAMENTALS: CONCEPTS AND TOOLS 04

Fundamental Concepts & Techniques involved in Real Estate Development Process. Introduction Real Estate Development, Developers, and the Role of Other Professions, The Real Estate Market and Urban Economics Leasing Basics.

UNIT II EVENTS AND PRE PROJECT STUDIES 09

Modeling Sequential events in real estate development process – Site evaluation – Land Procurement – Development Team assembly – market study. The Basis of cash flow Basic Calculations for Time Value of Money in Real Estate, Basic Calculation for Direct Capitalization, Approach Basic Calculations for Discounted cash flow, Mortgage Basics - Mortgage Calculations and Decisions.

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UNIT III THE REAL ESTATE DEVELOPMENT PROCESS 12

Identifying a Project, Getting the Financing - Sources of Commercial Equity and Debt Should it happen - Social and Community Desirability Will it work - Financial Feasibility, Getting Approval - The Entitlement Process, Collaborating - Public-Private Partnerships and the Expanding Role of Local Governments., Cementing the Deal - Legal Commitments and Obligations, Making it Happen – Construction, Making it Work – Management, Making it Worthwhile - Creating Value.

UNIT IV TRENDS AND ISSUES IN DEVELOPING DIFFERENT PROPERTY TYPES 10

Multi-Family/Student Housing/Affordable Housing/Senior Housing, Mixed Use/Transport Oriented Development/ Smart Growth, Environmental Remediation/Brownfield Development and Green Buildings and Green Infrastructure.

UNIT V PROJECT MARKETING & HAND-OVER OF THE COMPLETED PROJECT 10

Communication tools required for presenting the project, In house sales promotion, franchisee system, joint venture and sharing issues, procedure and laws relating to transfer of completed project.

TOTAL: 45 PERIODS

OUTCOMES:

- To understand the fundamentals of real estate development and the significance of team work to make a successful project.
- To be exposed to the contemporary trends and issues in real estate projects.

TEXTBOOKS:

1. Gerald R Cortesi, “Mastering Real estate principles”; Dearborn Trade Publishing, New York, U.S.A. 2001.
2. Fillmore W Galaty, “Modern Real estate practice” Dearborn Trade Publishing, New York, U.S.A. (2002).
3. Real Estate Principles, a Value Approach. David C. Ling and Wayne R. Archer, 4th Edition, 2012.

REFERENCES:

1. Tanya Davis, “Real estate developer’s handbook”, Atlantic pub company, Ocala, USA. (2007).
2. Mike .E. Miles, “Real estate development – Principles & Process 3rd edition, Urban Land Institute, ULI – Washington DC, (2000).
3. Richard B Peiser & Anne B. Frej, “Professional real estate development” – The ULI guide to the business ; Urban Land Institute U.S.A. (2003).
4. http://www.citylab.com/work/2012/11/real-estate-deal-could-change futureeverything/3897.
5. http://community-wealth.org/_pdfs/articles-publications/sri/article-pivo.pdf.

AR7020 STEEL ARCHITECTURE AND DESIGN

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To understand the design potential of steel as a material in construction.
- To familiarize the students with the inherent structural benefits of the material steel.
- To inform the various components of steel as structural and aesthetic design thru various case studies.
- To familiarize the students with the best practice of steel as a construction material.

UNIT I INTRODUCTION TO STEEL MATERIAL 08

Materiality of steel, structural properties of steel, advantages of steel in construction. History of metal in construction – Iron to Steel. Steel and tension. Industrialization and mass fabrication of steel. Casting of steel in historic and contemporary examples. Invention of hollow structural sections. Hot rolled steel shapes, various hollow structural sections.

UNIT II HIGH TECH AND CONTEMPORARY ARCHITECTURE 10

Introduction to high tech movement. Understanding of various typologies of high tech movement –Extruded, Grid/Bay, Diagrids, arched/ curved structures, tensile. Advantages of diagrids over standard frames. Curved steel – creating curves in steel buildings, limitations in curving steel. Evolution of AESS (architecturally exposed structural steel) through high tech movement.

UNIT III STRUCTURAL EXPRESSION OF STEEL 10

Introduction to AESS (architecturally exposed structural steel), standard structural steel versus AESS. Factors that define AESS. Characteristics and categories of AESS. Connection types for AESS – bolted, welded and cast connections. Member types for AESS – Tubular and standard sections. Various steel frame design, basic connection strategies, basic understanding of steel floor systems, truss systems and braced systems.

UNIT IV SUSTAINABILITY, STEEL AND OTHER MATERIALS 09

Introduction to steel as a sustainable material, Recycled, Reuse and adaptive reuse of steel. Steel and glazing systems, support systems for glazing. Technical aspects of combining steel with glass. Various steel and glass envelope systems - curtain wall system, wind braced support systems, cable net walls, spider steel connections with structural glass, simple and complex cable systems. Handling curves and lattice shell construction. Advanced framing system – Steel and Timber. Low carbon design strategies.

UNIT V FABRICATIONS, ERECTION AND IMPLICATIONS ON DESIGN 08

Study on transformation of architectural design into fabricated elements. Study of process profile thru case studies. Role of physical and digital models in fabrication. Steel in temporary/ exhibit buildings. Need for corrosion and fire protection. Various finishes and coating systems of steel. Detailed study on corrosion protection and fire protection systems. Transportation, site issues and erection on site. Erection of beams and columns. Effects of climate and weather on erections. Other issues relating to practical implication of design on site.

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding of steel as a structural, functional and aesthetic material in design and construction practice.

REFERENCES:

1. Buake, Terrimeyer; Architectural Design in steel; SPON; 2004.
2. Victoria Ballard & Bell; Materials for Architectural design; Lawrence King 2006.
3. Modern steel construction in Europe; Elsevier; 1963.
4. Benevolo, Leonardo; History of modern architecture, 2 Vols; Routledge & Kegan Paul; 1960.
5. Peter Silver etc.; Structural engineering for Architects, Handbook; Laurence King; 2013.
6. Handbook of steel construction, Canadian Institute of steel construction, 2010.
7. Leckie, John; Steel and other materials, Canadian Institute of steel construction, 2007.

AR7021 STRUCTURE AND ARCHITECTURE

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To study evolution of structural systems through history.
- To familiarise the students with concepts of structural design through works of architects/
- engineers.
- To study architectural expression through its structure.
- To analyze and understand the relationship between form & structure through seminars.

UNIT I HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA 08

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 08

Post Industrial modular construction of large span and suspension structures in steel and Concrete - projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen. Structure in Deconstructivism – Structure and aesthetics.

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 Standsted 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 10

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 09

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.

TOTAL: 45 PERIODS

OUTCOMES:

- The student will understand and get acquainted with the concepts of structural design and its influence on the functional and aesthetic domains of architectural design relating to historic and contemporary periods.
- The student will be acquainted with the architectural expression, its relation between form and structure through relevant case studies.

TEXTBOOKS:

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. COX Architects Millennium; Images; 2000.
3. Enric Miralle & Carme Pinos, Olympic Archery Building, 857072 COH.
4. Prada Aoyama Tokyo Herzog & De Meuron. Milan,IT: Progetto Prada Arte Srl, 2003.
5. Christopher Beorkrem, Material Strategies in Digital Fabrication, Routledge, Taylor & Francis Group, 2013.
6. Angus J. Macdonald, Structure and Architecture, Architectural Press, 2001 (available online).

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AR7022	SUSTAINBLE ARCHITECTURE AND PLANNING	L	T	P/S	C
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OBJECTIVES:

- To understand the concept of sustainability and sustainable development.
- To inform the various issues like climate change, ecological footprint, etc.
- To understand low impact construction practices, life cycle costs and alternative energy resources.
- Familiarize the students with the various rating systems for building practices with case.
- Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

UNIT I INTRODUCTION TO SUSTAINABILITY 07

Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report – Ethics and Visions of sustainability. Circles of Sustainability. Sustainable economy and Use. Eco systems, food chain and natural cycles or cradle to cradle concept.

UNIT II CLIMATE CHANGE AND SUSTAINABILITY 10

Overview of climate change and its impact on a global and regional scale. Principles of energy systems. Energy crisis and global environment. Study on Vernacular techniques and technological advancements in climate control in various climatic zones.

UNIT III SITE AND SUSTAINABILITY 08

Sustainable site selection and development. Introduction to Green building concepts. Teri, LEED, GIRHA and BREEAM. Ecology and sustainability. Various sources of energy, recyclable products and embodied energy.

UNIT IV SUSTAINABLE MATERIALS 10

Selection of materials Eco building materials and construction. Low impact construction – Bio mimicry, Zero energy buildings, Nano technology and smart materials.

UNIT V SUSTAINABLE CITIES 10

Dimensions of sustainable, sustainable community, Social, cultural and economic factors, urban ecology, urban heat island effects, smog etc. Various case studies of eco city or communities.

TOTAL: 45 PERIODS

OUTCOMES:

- The students are oriented about the concepts of ecosystem carrying capacity, ecological footprint, sustainability and sustainable development.
- The students are aware of the emerging vulnerabilities of global warming and climate change and understand the contribution of building industry to the same.
- The students are familiar with the various approaches to achieving sustainable buildings and Communities.
- The students understand the various incentives and evaluation systems for green buildings.

TEXTBOOKS:

1. Dominique Gauzin – Muller “Sustainable Architecture and Urbanism: Concepts, Technologies and examples”, Birkhauser, 2002.
2. Slessor, Eco-Tech : “Sustainable Architecture and High Technology”, Thames and Hudson 1997.
3. Ken Yeang, “Ecodesign : A manual for Ecological Design”, Wiley Academy, 2006.

REFERENCES:

1. Arian Mostaedi , “Sustainable Architecture : Low tech houses”, Carles Broto, 2002.
2. Sandra F.Mendler & William Odell, “HOK Guidebook to Sustainable Design”, John Wiley and sons, 2000.
3. Richard Hyder, “Environmental brief: Pathways for green design”, Taylor and Francis, 2007.
4. Brenda Vale and Robert Vale, “Green Architecture: Design for a sustainable future”, Thames and Hudson 1996.

AR7023	THEORY OF DESIGN	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To understand design and the role of the designer in changing society.
- To familiarize the students with methodologies, theories and models of the design process.
- To inform students about the term creativity and introduce techniques which will enable creative thinking.
- To inform the approaches that generates ideas for architectural design and the importance of the participatory approach to design.

UNIT I INTRODUCTION TO DESIGN 07

Definition and understanding of design- design in history -changing role of designer on society- different classifications of design according to scale, process, mode of production, etc.,

UNIT II DESIGN METHODOLOGY MOVEMENT 10

Context for the rise of the design methodology movement- theories of the first generation and the second generation design methodologists- various models of the design process- focus on the design problem: ideas of escalation/regression and wicked problem.

UNIT III CREATIVE THINKING 10

Understanding the term creativity- theories on thinking: left brain/ right brain, convergent and divergent thinking, lateral and vertical thinking- design spectrum from the logical to chance - blocks in creative thinking- various techniques to generate creativity.

UNIT IV ARCHITECTURAL CREATIVITY 08

Design puzzles and traps - approaches to generate ideas for architectural design - types of concepts- personal philosophies and strategies of individual designers - channels to creativity in architecture.

UNIT V DESIGN AND PEOPLE 10

Concept of pattern language- participatory approach to design - design as process.

TOTAL: 45 PERIODS

OUTCOMES:

- An ability to think about architecture as one of the many fields under the broader ambit of design as a fundamental human activity.

TEXTBOOKS:

1. Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences - John Wiley & Sons, New York, 1981.
2. Bryan Lawson - How Designers Think, Architectural Press Ltd., London, 1980.
3. Anthony Antoniades, Poetics of architecture- Theory of design VNR; 1992.
4. Paul Alan Johnson, Theory of Architecture- Concepts, Themes, Practices; VNR; 1994.
5. Christopher Alexander, Pattern Language, Oxford University Press, 1977.
6. James C. Snyder, Anthony J. Catanese, Timothy L. McGinty- Introduction to Architecture, McGraw Hill 1979.

REFERENCES:

1. Victor Papanek, Design for the real world, Human Ecology and Social Change; Chicago Review Press; 2005.
2. Edward De Bono, Lateral Thinking- Text book of Creativity; Penguin books; 1990.
3. Design methods- Christopher Jones, John Wiley and Sons; 1980.
4. Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984.
5. Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984.
6. Evans, Helen Marie; Dumesnil, Carla Davis- An Invitation to Design, Macmillan Publishing Co., New York, 1982.

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AR7024	UNDERSTANDING MADRAS-CHENNAI CITY	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To understand Chennai city through history, cultural influence.
- To understand about the differences in planning & character of historic cores and new neighborhoods of Chennai city.
- To understand the ecosystems of Chennai area.
- To understand current issues due to population pressure & destruction of natural ecosystems in Chennai.

UNIT I COLONIAL HISTORY 10

Brief outline of pre-colonial period- fishing hamlets, Role of Trade, Ports, European settlers- Portuguese, Dutch, British periods- White & Black town- Political history & social life- Administrative, military and economic importance of the city.

UNIT II HISTORIC CORES & NEW DEVELOPMENT 10

Historic cores like George town, Mylapore, Triplicane- Residential development in post independence period like Besant Nagar, Anna Nagar, T. Nagar, KK Nagar- Growth of city & infrastructure development, Population & demographic changes, industrial zone, special economic zone.

UNIT III CULTURE 08

Understanding the traditions and festivals, religious & ethnic diversity, music, dance, theatre, literature, art, architecture, cinema & politics.

UNIT IV ECOLOGY 08

Understanding the natural ecosystems of the city- coastal ecosystems, sea, river, estuary, wetlands, indigenous forests, lakes, tanks, flora & fauna, navigational canals MRTS encroachment, destruction of navigation routes, encroachment of water bodies & marshlands.

UNIT V URBAN ISSUES 09

Impact of migration, globalization and mass transit system, urban poor and housing scenario, Growth of IT, automobile industry and medical tourism.

TOTAL: 45 PERIODS

OUTCOMES:

- The student understands the history & culture of Chennai city and the influence of European settlers on the city.
- The student will gain understanding on the ecology of Chennai area.
- The student will gain understanding of the current issues, growth of the city and the influence of the master plan.

TEXTBOOKS:

1. Madras Rediscovered, S. Muthiah, Westland Ltd, 2008.
2. Madras then- Chennai now- Nandhitha Krishna &Tishani Doshi, Roli Books 2013.
3. An INTACH Guide- Madras- The Architectural Heritage, K. Kalpana and Frank Schiffer- INTACH Publication, 2003.
4. Chennai- Not Madras- Perspectives on the city. Edited by A.R. Venkatachalapathy, Marg Publications, 2006.
5. C.S. Lakshmi; The Unhurried City - Writings on Chennai, Penguin Books; 2004.

REFERENCES:

1. KV Raman, The Early History of Madras Region, Published by C.P.Ramaswami Aiyar Foundation, Chennai.
2. S. Muthiah; A Madras Miscellany – People, Places and Potpourri , East West Press Pvt Ltd, 2011.
3. Nandhitha Krishna; ,Madras- Chennai- Its history & environment, C.P.Ramaswami Aiyer Foundation 2009.
4. David Waltner etc.; The Ecosystem Approach: Complexity, Uncertainty, and Managing for Sustainability, Columbia University Press 2008.

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AR7025	VERNACULAR ARCHITECTURE	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the various regions of the country.
- To look at the impact of Colonial rule on the vernacular architecture of India.

UNIT I INTRODUCTION 06

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 09

Different approaches and concepts to the study of vernacular architecture: an over view – 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 08

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 10

Colonial influences on the Traditional 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.

TOTAL: 45 PERIODS

OUTCOMES:

- An Understanding on the study of Indian vernacular architecture as a process and also to provide an overview of various approaches and concepts.
- An exposure to various vernacular architectural forms in various regions.
- An understanding on the impact of colonial rule on vernacular architecture in India.

TEXTBOOKS:

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; Faber & Faber; 1970.

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, Ahmadabad 1992.
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.
6. Weber (W) & Yannas (S); Lessons from Vernacular Architecture; Routledge; 2014.

GE7071	DISASTER MANAGEMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR).
- To enhance awareness of institutional processes in the country.
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

UNIT I INTRODUCTION TO DISASTERS 09

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don'ts during various types of Disasters.

UNIT II APPROACHES TO DISASTER RISK REDUCTION (DRR) 09

Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayat Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stake- holders- Institutional Processes and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT 09

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV DISASTER RISK MANAGEMENT IN INDIA 09

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, and Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS 09

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS

OUTCOMES:

- Differentiate the types of disasters, causes and their impact on environment and society.
- Assess vulnerability and various methods of risk reduction measures as well as mitigation. Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.

TEXTBOOKS:

1. Singhal J.P. "Disaster Management", Laxmi Publications, 2010. ISBN-10: 9380386427 ISBN- 13: 978-9380386423.

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2. Tushar Bhattacharya, “Disaster Science and Management”, McGraw Hill India Education Pvt. Ltd., 2012. ISBN-10: 1259007367, ISBN-13: 978-1259007361].
3. Gupta Anil K, Sreeja S. Nair. Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi, 2011.
4. Kapur Anu Vulnerable India: A Geographical Study of Disasters, IIAS and Sage Publishers, New Delhi, 2010.

REFERENCES:

1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005.
2. Government of India, National Disaster Management Policy,2009.

GE7074 HUMAN RIGHTS

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I **09**

Human Rights – Meaning, origin and Development. Notion and classification of Rights – Natural, Moral and Legal Rights. Civil and Political Rights, Economic, Social and Cultural Rights; collective / Solidarity Rights.

UNIT II **09**

Evolution of the concept of Human Rights Magana carta – Geneva convention of 1864. Universal Declaration of Human Rights, 1948. Theories of Human Rights.

UNIT III **09**

Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV **09**

Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V **09**

Human Rights of Disadvantaged People – Women, Children, Displaced persons and Disabled persons, including Aged and HIV Infected People. Implementation of Human Rights – National and State Human Rights Commission – Judiciary – Role of NGO‟s, Media, Educational Institutions, Social Movements.

TOTAL: 45 PERIODS

OUTCOMES:

- Architecture students will acquire the basic knowledge of human rights.

REFERENCES:

1. Kapoor S.K., “Human Rights under International law and Indian Laws”, Central Law Agency, Allahabad, 2014.
2. Chandra U., “Human Rights”, Allahabad Law Agency, Allahabad, 2014.
3. Upendra Baxi, The Future of Human Rights, Oxford University Press, New Delhi; 2012.

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