

**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.

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

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

		<b>COURSE TITLE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	
<b>YEAR III</b>	<b>SEMESTER I</b>	Design of Structures I	√								
		History of Architecture and Culture III			√						
		Professional Elective I									
		Building Services II	√			√					
		Building Construction IV	√					√	√		
		Architectural Design IV		√						√	
		<b>COURSE TITLE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	
<b>YEAR III</b>	<b>SEMESTER II</b>	Design of Structures II	√								
		Urban Housing			√	√					
		Professional Elective II									
		Site Planning	√	√	√	√					
		Architectural Design Detailing	√					√	√		
		Architectural Design V		√						√	

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

		<b>COURSE TITLE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>
<b>YEAR V</b>	<b>SEMESTER I</b>	Human Settlements Planning	√		√					
		Specification, Estimation and Budgeting	√					√	√	
		Landscape Design	√							
		Professional Elective IV								
		*Open Elective II								
		Architectural Design VII		√	√	√				√
		<b>COURSE TITLE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>
<b>YEAR V</b>	<b>SEMESTER II</b>	Professional Elective V								
		Thesis		√	√	√	√		√	

**PROFESSIONAL ELECTIVES (PE)**

<b>COURSE TITLE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>
Theory of Design				√				
Energy Efficient Architecture				√				
Vernacular Architecture	√		√					
Art Appreciation	√							
Structure and Architecture	√	√			√			
Interior Design	√	√			√			
Graphic and Product Design	√	√			√			
Contemporary Architecture	√		√					
Understanding Madras - Chennai City	√		√					
Contemporary Building Materials	√	√		√			√	
Glass Architecture and Design	√	√		√			√	
Steel Architecture and Design	√	√		√			√	
Digital Art	√							
Contemporary Process in Architectural Design	√							
Architectural Journalism			√		√			√
Entrepreneurship skills for Architects					√		√	√

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**CHOICE BASED CREDIT SYSTEM**  
**CURRICULA I - X SEMESTERS**  
**AND**  
**SYLLABI I - III SEMESTERS**

**I SEMESTER**

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

**II SEMESTER**

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

### III SEMESTER

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

### IV SEMESTER

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

### V SEMESTER

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

### VI SEMESTER

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

**VII SEMESTER**

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

**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.		Practical Training	EEC	X	x	x	x	12	
<b>TOTAL</b>				<b>X</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>12</b>	

**IX SEMESTER**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Pre-requisites
<b>THEORY</b>									A pass is required in Architectural Design VI (Sem VII)
1.		Human Settlements Planning	PC	3	3	0	0	3	
2.		Urban Housing	HS	3	3	0	0	3	
3.		Landscape Design	PC	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	
<b>STUDIO</b>									
6.		Architectural Design VII	PC	16	0	0	16	8	
<b>TOTAL</b>				<b>31</b>	<b>15</b>	<b>0</b>	<b>16</b>	<b>23</b>	

**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.		Thesis	EEC	36	0	0	36	18
<b>TOTAL</b>				<b>39</b>	<b>3</b>	<b>0</b>	<b>36</b>	<b>21</b>

**TOTAL NO. OF CREDITS: 210**

\*Course from the curriculum of other UG Programmes

### HUMANITIES AND SOCIAL SCIENCES (HS)

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.		History of Architecture and Culture I	HS	3	3	0	0	3
2.		Art Studio	HS	5	1	0	4	3
3.		History of Architecture and Culture II	HS	3	3	0	0	3
4.		History of Architecture and Culture III	HS	3	3	0	0	3
5.		Evolution of Human Settlements	HS	3	3	0	0	3
6.		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.		Mathematics	BS	4	2	2	0	3
2.		Climate and Built Environment	BS	5	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.		Architectural Drawing I	ES	5	1	0	4	3
2.		Mechanics of Structures I	ES	4	2	2	0	3
3.		Building Materials I	ES	3	3	0	0	3
4.		Architectural Drawing II	ES	5	1	0	4	3
5.		Mechanics of Structures II	ES	4	2	2	0	3
6.		Building Materials II	ES	3	3	0	0	3
7.		Building Service I	ES	4	2	0	2	3
8.		Design of Structures I	ES	4	2	2	0	3
9.		Building Services II	ES	4	2	0	2	3
10.		Design of Structures II	ES	4	2	2	0	3
11.		Specification Estimation and Budgeting	ES	3	3	0	0	3
12.		Building Services III	ES	4	2	0	2	3

**PROFESSIONAL CORE (PC)**

SL. NO	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
1.		Basic Design	PC	12	0	0	12	6
2.		Theory of Architecture	PC	4	2	0	2	3
3.		Building Construction I	PC	5	1	0	4	3
4.		Architectural Design I	PC	12	0	0	12	6
5.		Building Construction II	PC	5	1	0	4	3
6.		Architectural Design II	PC	14	0	0	14	7
7.		Building Construction III	PC	5	1	0	4	3
8.		Architectural Design III	PC	14	0	0	14	7
9.		Building Construction IV	PC	5	1	0	4	3
10.		Architectural Design IV	PC	14	0	0	14	7
11.		Site Planning and Development	PC	3	3	0	0	3
12.		Architectural Design Detailing	PC	5	1	0	4	3
13.		Architectural Design V	PC	16	0	0	16	8
14.		Professional Practice and Ethics	PC	3	3	0	0	3
15.		Urban Design	PC	3	3	0	0	3
16.		Architectural Design VI	PC	16	0	0	16	8
17.		Human Settlements Planning	PC	3	3	0	0	3
18.		Landscape Design	PC	3	3	0	0	3
19.		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.		Theory of Design	PE	3	3	0	0	3
2.		Energy Efficient Architecture	PE	3	3	0	0	3
3.		Vernacular Architecture	PE	3	3	0	0	3
4.		Art Appreciation	PE	3	3	0	0	3
5.		Structure and Architecture	PE	3	3	0	0	3
6.		Interior Design	PE	3	3	0	0	3
7.		Graphic and Product Design	PE	3	1	0	4	3
8.		History of Contemporary Architecture	PE	3	3	0	0	3
9.		Understanding Madras - Chennai City	PE	3	3	0	0	3
10.		Contemporary Building Materials	PE	3	3	0	0	3
11.		Glass Architecture and Design	PE	3	2	2	0	3
12.		Steel Architecture and Design	PE	3	3	0	0	3
13.		Digital Art	PE	3	1	0	4	3
14.		Contemporary Process in Architectural Design	PE	3	3	0	0	3
15.		Architectural Journalism	PE	3	3	0	0	3
16.		Entrepreneurship skills for Architects	PE	3	3	0	0	3
17.		Architectural Conservation	PE	3	3	0	0	3
18.		Real Estate Development	PE	3	3	0	0	3
19.		Advanced Structures	PE	3	3	0	0	3

20.		Earthquake Resistant Architecture	PE	3	3	0	0	3
21.		Sustainable Architecture and Planning	PE	3	3	0	0	3
22.		Construction and Project Management	PE	3	3	0	0	3
23.		Construction Technology	PE	3	3	0	0	3
24.		Dissertation	PE	6	0	0	6	3
25.		Building Information Modeling	PE	3	0	0	6	3
26.	*GE	Disaster Management*	PE	3	3	0	0	3
27.	*GE	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.		Communication English	EEC	4	2	0	2	3
2.		Computer Aided Visualization	EEC	5	1	0	4	3
3.		Practical Training	EEC	x	x	x	x	12
4.		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		6		3	3					18
2	BS	3		3	3							9
3	ES	3	9	3	6	6	3	3		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
	<b>Total</b>	<b>21</b>	<b>21</b>	<b>22</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>12</b>	<b>23</b>	<b>21</b>	<b>210</b>
8	<b>Non-Credit/Mandatory</b>	NCC/NSS/ YRC/ Rotaract		Rural study tour		All India Tour						

**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, 7<sup>th</sup> Edition, 2009.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11<sup>th</sup> Reprint, 2010.
3. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2<sup>nd</sup> Edition, 5th Reprint, 2009.
4. Gupta S.C and Kapoor V.K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 9th Edition, 1996.

**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.

**AR7113****COMMUNICATION ENGLISH**

<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
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:** Learners should be able to

- 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].

AR7112

ART STUDIO

<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>

#### 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.



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 I.H., "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.

**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.

**TEXTBOOKS:**

1. Owen Cappelman & Michael Jack Jordon, Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993.
2. Charles Wallschlaggerm & Cynthia Basic-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.

**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 ANALYSIS 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.

**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.

**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.

**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.

<b>AR7212</b>	<b>BUILDING CONSTRUCTION I</b>	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
		<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>

**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.

**AR7211****ARCHITECTURAL DRAWING II**

<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>

**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.

**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.



**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                    09**  
**ARCHITECTURE**

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 ARCHITECTURE AND THE INFLUENCE OF DELHI                    08**  
**SULTANATE RULE IN INDIA**

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. Christopher Tadgell, The History of Architecture in India from the Dawn of civilization to the End of the Raj, Longman 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.

**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).

<b>AR7312</b>	<b>CLIMATE AND BUILT ENVIRONMENT</b>	<b>L</b>	<b>T</b>	<b>P/S</b>	<b>C</b>
		<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>

**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 envelopes 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), Manakbhanan, 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.

**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.



**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.