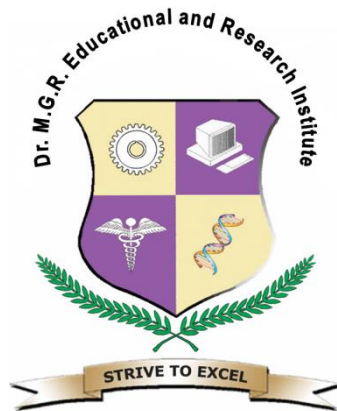


FACULTY OF ARCHITECTURE

(CA / 5 / Academic – TN41 dt. 28.07.11)

Dr. M.G.R
EDUCATIONAL & RESEARCH INSTITUTE
UNIVERSITY

(Declared as Deemed -to- University, u/s. 3 of UGC Act 1956)



B.Arch
SYLLABUS – 2017

Sponsored by,
Dr. M.G.R. Educational and Research Institute Trust,
Chennai – 600 095

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SYLLABUS - 2017
FACULTY OF ARCHITECTURE
B.ARCH
SEMESTER - I

Code No	COURSE TITLE	L	T	S	C
THEORY					
BMA17A01	Applied Mathematics	3	0	0	3
BAR17001	History of Architecture & Culture - I	2	0	0	2
BEN17A01	English Communication Skills	2	0	0	2
BAR17002	Building Materials - I	2	0	0	2
THEORY CUM STUDIO					
BAR17L01	Art Studio *	1	0	3	2
BAR17L02	Building Construction - I *	1	0	4	3
BAR17003	Architectural Drawing - I	2	0	3	3
STUDIO					
BAR17L03	Architectural Design - I	0	0	12	6
Total Credit		13	0	22	23

SEMESTER - II

Code No	COURSE TITLE	L	T	S	C
THEORY					
BCE17A01	Mechanics of Structures - I	3	0	0	3
BAR17004	History of Architecture & Culture - II	2	0	0	2
BAR17005	Theory of Architecture - I	2	0	0	2
BMG17A01	Value Education	1	0	0	1
BAR17006	Building Materials - II	2	0	0	2
THEORY CUM STUDIO					
BAR17007	Architectural Drawing - II	1	0	3	3
STUDIO					
BAR17L04	Computer Studio - I*	1	0	4	3
BAR17L05	Building Construction - II *	0	0	4	2
BAR17L06	Architectural Design - II	0	0	12	6
Total Credit		12	0	23	24

SEMESTER - III

Code No	COURSE TITLE	L	T	S	C
THEORY					
BCE17A02	Mechanics of Structures - II	3	0	0	3
BAR17008	Theory of Architecture - II	2	0	0	2
BAR17009	History of Architecture - III	2	0	0	2
BAR17010	Building Services - I	3	0	0	3
BAR17011	Building Materials - III	2	0	0	2
THEORY CUM STUDIO					
BAR17L07	Personality Development*	0	0	2	1
BAR17L08	Computer Studio - II*	1	0	4	3

STUDIO					
BAR17L09	Building Construction – III *	0	0	4	2
BAR17L10	Architectural Design - III	0	0	12	6
Total Credit		13	0	22	24

SEMESTER - IV

Code No	COURSE TITLE	L	T	S	C
THEORY					
BCE17A03	Design of Structures - I	3	0	0	3
BAR17012	History of Architecture - IV	2	0	0	2
BAR17013	Building Services - II	3	0	0	3
BAR17014	Climatology	3	0	0	3
BAR17015	Building Materials - IV	2	0	0	2
THEORY CUM STUDIO					
BAR17016	Surveying and Site Planning	2	0	2	3
STUDIO					
BAR17L11	Building Construction – IV *	0	0	4	2
BAR17L12	Architectural Design - IV	0	0	14	7
Total Credit		15	0	20	25

SEMESTER - V

Code No	COURSE TITLE	L	T	S	C
THEORY					
BCE17A04	Design of Structures - II	3	0	0	3
BAR17017	History of Architecture - V	2	0	0	2
BAR17018	Building Services - III	3	0	0	3
BAR17019	Building Materials - V	3	0	0	3
BAR17E	Elective -I	2	0	0	2
THEORY CUM STUDIO					
BAR17020	Architectural Acoustics	2	0	2	3
STUDIO					
BAR17L13	Building Construction – V *	0	0	4	2
BAR17L14	Architectural Design - V	0	0	14	7
Total Credit		15	0	20	25

SEMESTER - VI

Code No	COURSE TITLE	L	T	S	C
THEORY					
BCE17A05	Design of Structures - III	3	0	0	3
BAR17021	Human Settlements & Town Planning	3	0	0	3
BAR17022	History of Architecture – VI	2	0	0	2
BAR17023	Building Materials – VI	2	0	0	2
BAR17E	Elective - II	2	0	0	2
THEORY CUM STUDIO					
BAR17024	Interior Design	2	0	2	3
STUDIO					

BAR17L15	Building Construction – VI *	0	0	4	2
BAR17L16	Architectural Design - VI	0	0	15	7
Total Credit		14	0	21	24

SEMESTER - VII

Code No	COURSE TITLE	L	T	S	C
THEORY					
BAR17025	Cost Estimating & Scheduling	3	0	0	3
BAR17026	Urban Design and Landscape	3	0	0	3
BAR17E	Elective - III	3	0	0	3
THEORY CUM STUDIO					
BAR17EL	Elective –IV*	1	0	4	3
STUDIO					
BAR17L17	Architectural Design - VII	0	0	16***	8
Total Credit		10	0	-	20

SEMESTER - VIII

Code No	COURSE TITLE	L	T	S	C
BAR17L18	Practical Training	0	0	**	12
Total Credit		0	0	**	12

SEMESTER - IX

Code No	COURSE TITLE	L	T	S	C
THEORY					
BAR17027	Professional Practice	3	0	0	3
BAR17E	Elective – V	3	0	0	3
THEORY CUM STUDIO					
BAR17L19	Introduction to Thesis *	2	0	4	4
STUDIO					
BAR17L20	Architectural Design - VIII	0	0	20***	10
Total Credit		8	0	-	20

SEMESTER - X

Code No	COURSE TITLE	L	T	S	C
BAR17E	Elective – VI	2	0	0	2
BAR17L21	Thesis	0	0	**	17
Total Credit		2	0	**	19

Total No of Credits: 216

* For Building Construction (I-VI), Computer Studio (I-III), Art Studio, Personality Development, Working Drawing, Advanced Digital Studio, Introduction to Thesis, the assessment shall be Internal only based on Continuous Assessment and VIVA conducted at the end of the semester.

** Undeterminable Number of Hours, It may be 30-35 hrs duration/week.

***Variable hours due to extensive Site Studies.

ELECTIVES

S.No	SEMESTER	CODE	COURSE TITLE	L	T	S	C
01	V SEM & VI SEM	BAR17E01	Energy Efficient Architecture	2	0	0	2
		BAR17E02	Vernacular Architecture	2	0	0	2
		BAR17E03	Theory of Design	2	0	0	2
		BAR17E04	Recycling and Waste Management	2	0	0	2
		BAR17E05	Interior Landscape Design	2	0	0	2
		BAR17E06	Concepts of Traditional architecture	2	0	0	2
02	VII SEM & IX SEM	BAR17EL1	Working Drawings	1	0	4	3
		BAR17EL2	Advanced Digital Studio	1	0	4	3
		BAR17E07	Construction Technology	3	0	0	3
		BAR17E08	Project Management	3	0	0	3
		BAR17E09	Urban Housing	3	0	0	3
		BAR17E10	Architectural Conservation	3	0	0	3
		BAR17E11	Sustainable Planning and Architecture	3	0	0	3
		BAR17E12	Safety Systems and Building Management	3	0	0	3
		BAR17E13	Earthquake Resistant Architecture	3	0	0	3
		BAR17E14	Smart Cities	3	0	0	3
		BAR17E15	Advanced Structures	3	0	0	3
03	X SEM	BAR17E16	Human Psychology	2	0	0	2
		BAR17E17	Entrepreneurship Development	2	0	0	2

**B. ARCH - SYLLABUS
SEMESTER - I**

BMA17A01

APPLIED MATHEMATICS

**LTSC
3003**

AIM:

The course is aimed at developing basic Mathematical skill for Architecture students, to understand structural concepts complex form and geometry

OBJECTIVES:

Identifying practical problems and obtain solutions - trigonometric and exponential functions.
Studying the properties of lines and planes in space, Understand 3D material
Solving differential equation of certain type.
Analyzing data collection and interpretation of results using statistical tools.

CONTENT:

UNIT-I	TRIGONOMETRY	8
Trigonometric : Sine, Cosine and tan functions, hyperbolic functions, Exponential functions De-Moivre's theorem.		
UNIT-II	MENSURATION	8
Area of plane figures, Volume of Solid figures, Ratio and proportion, Golden ratio, Fibonacci sequence.		
UNIT-III	BASIC STATISTICS AND PROBABILITY	11
Arithmetic mean, median ,mode, standard deviation and variance ,regression and correlation, elementary probability theory- Theorems of probability (simple problems)		
UNIT-IV	ORDINARY DIFFERENTIAL EQUATION	9
Second and higher order linear differential equations with constant coefficients-differential equations with variable coefficients of Euler type		
UNIT-V	THREE DIMENSIONAL ANALYTICAL GEOMETRY	9
Direction cosines and ratio's-Angle between two lines- Equation of a plane- Equations of a straight line- Coplanar lines- Shortest distance between skew lines-Sphere-Tangent plane-Plane section of a sphere(Simple problems)		

TOTAL: 45 PERIODS

REQUIRED READINGS:

1. Veerarajan, Y., "Engineering Mathematics (for first year)", Second edition, Tata Mc Graw – Hill pub., Co., Ltd., New Delhi 2002.
2. Venkataraman, M.K., "Engineering Mathematics", Volume I, Fourth Edition. The National Pub, Co., Chennai, 2003.

REFERENCES:

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001
2. Kandaswamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics" Volume I, Fourth Revised Edition, S. Chand & Co., New Delhi, 2000.
3. Kreyszig E., "Advanced Engineering Mathematics", Eight Edition, John Wiley and Sons (Asia) Ltd., Singapore, 2001.
4. 'Engineering Mathematics", Manikavasagan Pillai – S.V. Publication.

AIM:

To inform about the development of architecture in the ancient western world and the cultural and contextual determinants that produced that architecture.

OBJECTIVES:

To understand architecture as evolving within specific cultural contexts includes 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 and in Ancient Egypt, West Asia, Greece and Rome.

CONTENT:**UNIT-I PREHISTORIC AGE 6**

Introducing concepts of culture and Civilization – Paleolithic and Neolithic culture- art forms and evolution of shelter – megaliths – agricultural revolution and its impact on culture and civilization.

UNIT-II ANCIENT RIVER VALLEY CIVILIZATIONS: EGYPT 6

Landscape and culture of Ancient Egypt – history – religious and funerary beliefs and practices – monumentality – tomb architecture: evolution of the pyramid from the mastaba – temple architecture: mortuary temples and cult temples.

Great pyramid of Cheops, Gizah – temple of Amman Ra, Karnak – temple of Abu Simbel (Rock Cut).

UNIT-III ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA 6

Urbanization in the Fertile Crescent – Sumerian, Babylonian, Assyrian and Persian culture- evolution of city – states and their character – law and writing – theocracy and architecture – evolution of the Ziggurat – palaces.

Ziggurat of Ur, Urnamu – Palace of Sargon, Khosabad– Palace at Persepolis

UNIT-IV CLASSICAL PERIOD: GREECE 6

Landscape and Cultural of Greece – Minoan and Mycenaean cultures- Hellenic and Hellenistic cultures – Greek character- Greek polis and democracy- Greek city planning – architecture in the archaic and classic periods – Domestic architecture; Public Buildings: Agora, Stoas, Theatres, bouletrion and stadia's – Greek Temple: evolution and classification – Parthenon and Erechthion- orders in architecture: Doric, Ionic, Corinthian – Optical illusions in architecture.

UNIT V CLASSICAL PERIOD: ROME 6

Roman history: Republic and Empire – Rome religion and the Roman temple- Roman character- lifestyle- Roman urban planning – art and architecture as imperial propaganda: forums and basilicas- domestic architecture – Structural forms, materials and techniques of construction - orders in architecture: Tuscan and Composite

Rome: Forum Romanum and other Imperial Forums, Enclosure and manipulation of space pantheon – Public buildings: Colloseum, Circus Maximus, Thermae of Caraculla.

TOTAL: 30 PERIODS

REQUIRED READINGS:

1. Sir Banister Fletcher, A History of Architecture, University of London, The Antholone Press, 1996.
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 Eido- 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 London, 1996
3. Gosta, E.Sandstrom, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
4. Webb and schaeffer; Western Civilization Volume I; VNR: NY: 1962
5. Vincent Scully: Architecture – The Natural and the Man made; Harper Collins. 1991

AIM:

To provide an adequate mastery and communicative English Language training primarily, reading and writing skills, secondarily listening and speaking skills.

OBJECTIVES:

To prepare the students for an effective participation in seminars, group discussions, paper presentation and general personal interactions at the professional level of above aim with proper grammar.

CONTENT:

UNIT-I	COMMUNICATION	6
Importance of Communication - Elements of good individual Communication – organizing oneself – different types of communication.		
UNIT-II	ORAL AND GROUP COMMUNICATION	6
Features of an effective speech- practice in speaking fluently – role play – telephone skills - etiquette.		
UNIT-III	PUBLIC SPEECH	6
Short Extempore speeches – facing audience – paper presentation – getting over nervousness – Interview techniques – preparing for interviews – mock interview – Body Language.		
UNIT-IV	CREATIVE WRITING	6
1.	a) Scope of Creative Writing	
	b) Writing a report/ format of the report	
	c) Oral report	
	d) Periodical Report	
	e) Progress Report	
	f) Field Report	
2.	Product Description – Description of devices & Mechanism	
UNIT-V	COMMUNICATION& COMPUNICATION	6
Preparation of minutes – video conference – Tele conference / Virtual meeting. Impact of internet on communication – communicate through computers – voice mail – broadcast messages – Internet relay Chat – email auto – response – FTP, etc.		

TOTAL: 30 PERIODS**REQUIRED READINGS:**

1. English Language Communication Skills – Urmila Rai – Himalaya Publishing, 2010
2. Writing Your Thesis by Paul Oliver – Sage Study Skills – Sage Publications, March 2008

REFERENCES:

1. Eric H Glendinning & Beverly Holmstrom, “study reading – A course in reading skills for academic purpose”, Cambridge University Press, 1992
2. John Kriman, “Good Style – writing for science and technology”, E & FN Spoon, an Imprint of Chapman & Hall, 1992.

AIM:

To introduce the materials like soil, lime, clay, stone, their properties, preparation and application. To understand about properties and use of bamboo, Casuarina, Coconut, Palm, straw bales and other rural materials are given.

OBJECTIVES:

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as soil, lime, stones and bricks.

To make the students understand about properties, characteristics, and uses of bamboo, cane, coconut, coir, jute, cane, straw bales etc.

Theoretical understanding of brick, types, their manufacture, various products, and practical application.

UNIT-I INTRODUCTION**6**

Soils – Formation – grain size distribution – soil classification systems.

Lime – Types of lime, classification of Lime, comparison between fat and hydraulic lime, Manufacturing process slaking, hardening - Testing and storage, Lime putty, Mortar, Precautions in handling and uses.

UNIT-II RURAL – BUILDING MATERIALS**8**

Mud as a building material – Soil stabilization, soil stabilized blocks – Soil Stabilization in cast in situ walls – flooring – roofing – plastering. Types of mud building and surface protection.

Bamboo, casuarinas, cane, coconut, palm, straw bales, coir, jute – properties – uses – fire retardant treatment and preservation and uses as different application in structures.

UNIT-III STONE**8**

Classification of rocks – Building stones – their uses – physical properties – brief study of tests for Stone – deterioration – preservation of stone – various stone finishes – cutting and polishing of Granites.

Types of stone masonry – random rubble/Ashlars, etc. – cavity walls – flooring, Copings, sills, lintels, corbels, arches.

UNIT-IV BRICKS AND CLAY PRODUCTS**8**

Bricks – brief study on manufacture of bricks – properties – uses – suitability – types of bricks – uses in buildings, structural tiles, ceramics, terracotta – uses.

TOTAL: 30 PERIODS**TEXT BOOKS:**

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

REFERENCES:

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

WEBSITES

<http://www.idrc.ca/library/documents/104800/chapz-e.html>

<http://www.baboo-Flooring.com>

<http://www.angelfite.com/inz/granite>

<http://ag.avizona.edu/SWES>

<http://www.angelfite.com/in>

AIM:

To develop presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials.

OBJECTIVES:

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.
- Involving them in a series of exercises which will help them experiment with form and volume.
- To involve students in a series of exercises which will look at graphic and abstract representations of art.

CONTENT:**UNIT-I DRAWING 12**

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 3D effects through light and shade from nature – Tools and materials – Illustration – Study of human being and mobiles.

UNIT-II PAINTING - I 12

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 12

Indoor and outdoor 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 12

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

UNIT-V APPLIED ART 12

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

TOTAL: 60 PERIODS

REQUIRED READINGS:

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.

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.
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.

OBJECTIVES:

To involve students in a number of drawing exercises that will analyze the various building components in a simple load bearing structure.

To involve students in a number of drawing exercises that will look at the design and detail of simple structures using naturally occurring materials such as mud, bamboo, straw, etc.

To involve students in a number of drawing exercises that will look at the design and detail of various building components in a simple load bearing structure using stone.

UNIT-I INTRODUCTION**15**

Functional requirements of building and its components, introduction to concept of load bearing and framed structures. Exercises – involving the same.

UNIT-II SOILS**20**

Detailing of walls, roofs, flooring and foundations using soils (rammed earth, compressed blocks). Design exercises using soil for building components in small scale buildings like laborer's house, art centre, snack bar.

UNIT-III RURAL MATERIALS**20**

Design and Construction Techniques using bamboo for building components for small scale buildings like snack bar, tree house.

Design Exercises: using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems flooring, Roofing options and plastering,

UNIT-IV STONE**20**

Design Exercises – Using stone (Ashlar, rubble etc.,) for building components including detailing of arches, corbels, coping, sills, lintels, corbels, arches, cladding in small scale buildings like classrooms, library and community hall.

TOTAL: 75 PERIODS**REQUIRED READINGS:**

1. Arora S.P. and Bindra S.P., Text book of Building Construction, Dhanpat Rai & Sons, New Delhi - 110002, 2012
2. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.

REFERENCES:

1. Don A. Watson Construction Materials and Processes McGraw Hill 1972, WB Mckey Building construction, Vol 1,2, Longman UK 1981.
2. Barry, The Construction of Buildings Affiliated East West press put Ltd New Delhi 1999.
3. Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

AIM

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.

OBJECTIVE

To involve students in a number of exercises that will help them to understand the nature of geometrical forms in terms of drawing plane and solid projections. .

To involve students in a number of exercises that will help to understand the representation of 3 Dimensional forms through isometric and axonometric drawings.

To introduce basic measured drawing of simple objects and building components.

CONTENT**GEOMETRICAL DRAWING****UNIT-I PLANE GEOMETRY 15**

Introduction to fundamentals of drawing/drafting - Construction of lines, angles - scales and area. Construction of plane - circles, tangent, curves and conic sections – construction and development of planar surface – square, rectangle, polygon etc.

UNIT-II ORTHOGRAPHIC PROJECTION OF PLANAR SURFACES 15

Isometric, axonometric and multi-view projection of geometric shapes namely square, circle, and polygon etc.

UNIT-III SOLID GEOMETRY 15

Introduction to simple projection – projection and development of solid surfaces – sections of solid, true shape of section and penetration of solids.

UNIT-IV ORTHOGRAPHIC PROJECTION OF SOLIDS 15

Isometric, axonometric and multi-view projection of solid – cube, prism 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, detailing in terms of construction, ornamentation, measured drawing of building components like column, door, window, cornice, etc.

TOTAL: 75 PERIODS

REQUIRED READINGS:

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. Engineering drawing by N D Bhatt

REFERENCES:

1. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by American Technical Society, 1966
2. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964
3. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd., Japan, 1967.
4. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.

AIM:

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.

OBJECTIVE:

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 mouldable 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 through design of simple architectural elements like entrance gates, walls, courtyards, porches, etc.

TOTAL: 180 PERIODS

REQUIRED READINGS

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

REFERENCES

1. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
2. Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canaa), 1979.
3. John W.Mills -The Technique of Sculpture, B.T.Batsford Limited, New York - Reinhold Publishing Corporation, London, 1966.
4. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
5. C.Lawrence Bunchy - Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y.10001, 1972.

SEMESTER - II

BCE17A01

MECHANICS OF STRUCTURES - I

**L T S C
3 0 0 3**

AIM:

To enable students to understand the structures in architecture.

To enable the students to understand the different structural materials used for various buildings.

OBJECTIVE:

By the end of the course the students shall be confident about the structural action of the various elements.

Further he will have sufficient knowledge about the various long span structures.

CONTENT

UNIT-I LOADS ON STRUCTURE

7

Loads – Static Loads – Dynamic Loads – Fire Loads – Effect of Temperature and Settlement.

UNIT-II STRUCTURAL MATERIALS

8

Properties of Structural Materials – Advantages and Disadvantage of Structural Materials – Choice of Structural Material for Domestic Buildings, Industrial Buildings, Tall Buildings and Long Span Buildings.

UNIT-III PROBLEM OF SPAN

10

History of Spanning – concept of Moment – Composition and Resolution of Forces – Theory of Bending Moments and Shear Force (Problem).

UNIT-IV TENSION AND COMPRESSION MEMBERS

10

Concepts of various structural systems – cables – Trusses – Arches – cable Roofs – Space Frames – Flat Slabs.

UNIT-V CURVED STRUCTURES AND LONG SPAN BUILDINGS

10

Theory of Vaults and Domes – Construction of Masonry Vaults and Domes – Concepts of Reinforced Concrete Shells. Domes and Vaults – Folded Plate Roofs – Tensile Structures.

TOTAL: 45 PERIODS

REQUIRED READINGS:

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

REFERENCES:

1. P.C.Punmia, Strength of Materials and Theory of Structures; Vol. I, Lakmi 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.
5. A.P.Dongre – Structural Engineering for Architecture, Scitech Publications Ltd.
6. Henry.J.cowan, Forrest Wilson, Structural Systems, Van Nostrand Reinhold Company, New York.
7. Mario Salvadori, Robert Heller, Structure in Architecture, Prentice International Series in Architecture, New Jersey, 1963.

AIM:

To inform about the development of architecture in India from ancient times to its evolution through history under two religious movements – Buddhism and Hinduism – and the cultural and contextual determinants that produce that architecture.

OBJECTIVES:

To understand India architecture and evolving within specific cultural contexts includes aspects of society, religions, politics and climate.

To gain knowledge of the development of architectural form with reference to technology, style and character in the Indus Valley Civilization, Vedic period and manifestation of Buddhist and Hindu architecture in Various parts of the country.

CONTENT:**UNIT-I ANCIENT INDIA 6**

Indus Valley Civilization: culture and pattern of settlement– Aryan civilization – theories and debates of origin – origins of early Hinduism – Vedic culture – Vedic Village and rudimentary form of bamboo and wooden construction – origins of Buddhism and Jainism.

UNIT-II BUDDHIST ARCHITECTURE 6

Evolution of Buddhism, Buddhist thought, art and culture – Hinayana and Mahayana Buddhism – interaction of Hellenic and Indian Ideas in Northern India – evolution of building typologies – the stupa, vihara and the chaitya hall – symbolism of the stupa – architectural production during ashoka's rule.

Ashoka Pillar, Sarnath – rock cut caves at barabar – sanchi stupa rock cut architecture in Ajanta and ellora – Karli – viharas at Nasik – Rani gumpha, Udaigirim – Takti Bahai, Ganadhara.

UNIT-III EVOLUTION OF HINDU TEMPLE ARCHITECTURE 6

Hindu forms of worship – evolution of temple form – meaning, symbolism, ritual and social importance of temple – categories of temple – elements of temple architecture – early shrines of the Gupta and Chalukyans period.

Tigawa temple – Ladh Khan and Durga temple, Aihole – Papanatha, Virupaksha temples Pattadakal – Kailasanathar temple, Ellora.

UNIT-IV TEMPLE ARCHITECTURE – SOUTHERN INDIA 6

Brief history of South India – relation between Bhakti period and temple architecture – of temple towns – Dravidian Order – evolution and form of gopuram.

Rock cut productions under Pallavas: shore temple, Mahabalipuram, and Kailasanatha temple Kanchipuram – Chola Architecture: Nartamalai, Brihadeeswara, Gangaikonda Choilapuram and Darasuram temple – temple gateways of Madurai and Chidambaram -Temple towns: Madurai, Srirangam and Kanchipuram. Hoysala architecture: Belur and Halebid.

UNIT-V TEMPLE ARCHITECTURE – NORTHERN INDIA 6

Temple architecture of Gujrat, Orissa , Madhyapradesh and Rajasathan – their salient features Lingaraja Temple, Bhuvanesar – Sun temple, Konark – Somanatha temple, Gujrat, Surya, Kund , Modhera. Khajuraho, Madhyapradesh – Dilwara temple, Mt. Abu.

TOTAL: 30 PERIODS**REQUIRED READINGS:**

1. Percy Brown, Indian Architecture (Buddhist and Hindu Perid) , Taraporevala and Sons, Bombay, 1983.

2. Satish Grover, the Architecture of India (Buddhist and Hindu Period), Vikas Publishing House Pvt. Ltd., New Delhi 2003.
3. 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.

REFERENCES:

1. A.Volwahn, Living Architecture – India (Buddhist and Hindu), Oxford and IBM, London, 1969.
2. George Michell, the Hindu Temple, BI Pub., Bombay, 1977.
3. Stella Kramrisch the Hindu Temple, Motilal Banarasidas, Delhi 1976.
4. K.V.Soundarajan, Art and Architecture of South India.
5. George Michell Ed, Temple Towns of Tamilnadu,
6. History of Indian Philosophy, Dasgupta.
7. A.Thampuram “Study of Architecture Forms in Malabar coast” Wiley and sons Inc.

AIM:

To establish a strong knowledge base on how architecture is social art backed by needs, how to develop a vocabulary for design process. Towards this students shall be exposed to articulation of forms, emotional effects, and aesthetic design relationships like proportion, scale, balance, symmetry etc., by studying architectural examples. Thrust will be simultaneously on understanding colour, its properties, influence, combinations and symbolism and meaning in cultures.

OBJECTIVE:

Theoretical understanding of various definitions of architecture and justification for architecture creations are to be learnt.

To understand the relationship between functional and aesthetics through analysis of selected buildings.

To understand the relationship between mass, geometrical form and space through analysis of selected buildings.

To understand the definition and use the components of design by studying representative examples.

To understand the definition, combination and relationship and symbolism of using colour in architecture.

UNIT-I INTRODUCTION TO ARCHITECTURE 4

Definitions of Architecture – Origin of Architecture – architecture as a discipline – context for architecture as satisfying human needs: functional, aesthetic and psychological-outline of components and aspects of architectural form-site, structure, skin, materials, services, use, circulation, expression, character, experience.

UNIT-II ELEMENTS OF ARCHITECTURE - FORM AND SPACE 6

Understanding fundamental elements such as point, line, plane, form and space, shape, pattern, light, colour, surface and texture with reference to the evolution of architectural form and space.

Understanding perceptual effects of specific geometric forms such as sphere, cube, pyramid, cylinder and cone and its sections as well as their derivatives with respect to the evolution of architectural form and space.

UNIT-III PRINCIPLES OF ARCHITECTURE 6

Understanding fundamental principles such as Proportion, Scale, Balance, Symmetry/Asymmetry, Rhythm, Axis, Hierarchy. Building Examples for each principles.

UNIT-IV CIRCULATION 6

Components of building circulation - The building approach, The building entrance, Configuration of Path, Path space relationship, Form of circulation space - Simple circulation diagram – Residence, restaurant,etc.

UNIT-V INTEGRATION OF AESTHETICS AND FUNCTION 8

Design process –Integration of aesthetics and function - Understanding of formative ideas, organization concepts, spatial characteristics, massing and circulation in design analysis of the following buildings: Falling Water ,& Guggenheim museum by F. L. Wright , Villa Savoye & Chapel of Notre-dame Du Haut by Le Corbusier.

TOTAL : 30 PERIODS

TEXT BOOKS

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

REFERENCES:

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

AIM:

To make the students understand and realize values required in their life. Personal as well as Professional values are the spontaneous and natural manifestation of good characters which is built on round principles of moral life. To make the students to develop their life skills.

OBJECTIVE:

To stress the need to acquire certain values of good manners that are essential for a respectable and successful life, in society.

To give confidence, to face a life that is full of challenges.

To cultivate a set of principles or standards of behavior; that are regarded desirable, important and held in high esteem by our society.

To incorporate values in their daily life to evolve meaning of their life, this adds joy, satisfaction and peace to life, and to exploit the skills hidden in their mind.

CONTENT:**UNIT-I****3**

Value Education – Introduction – Definition of values – why values? – Need for Inculcation of values – Object of Value Education – Sources of Values –

Types of Values:

- i) Personal Values
- ii) Social Values
- iii) Professional Values
- iv) Moral and spiritual values
- v) Behavioral (common) values

UNIT-II INTERPERSONAL RELATIONSHIPS**3**

Understanding different types of relationships, Ending a relationship constructively, Group strength, What makes a relationship healthy, Empathy and empathizing with others, Sympathy and empathy, Ways to improve empathy and pro-social behavior.

UNIT-III INTRODUCTION TO CORE LIFE SKILL**3**

What are life skill – Understanding skills and concept of life skill, Ten core life skill – Introduction, Life skills and Personality Development, Understanding use of core, Life skill in daily life, Application of life skill for education.

UNIT-IV SELF EXPLORATION AND KNOWING YOURSELF**3**

Components of self awareness, Identifying & developing resource in an individual, Identification and verification of self concept, Enhancing and motivating self and self – Enhancement, Self Affirmation, Practice Techniques: SWOT Analysis, Johari Window.

COPY WITH EMOTIONS AND STRESS

Understanding the positive and negative emotions, Taking responsibility of emotions stress and its impact on personality, Learning to manage stress in daily life.

UNIT-V THINKING SKILLS CRITICAL AND CREATIVE THINKING**3**

Analytical Thinking, Critical thinking in daily life finding new ways to do a thing, Looking at problem / Situations differently, Problem solving and decision making skills decision making &

Problem solving – problems and steps in problem solving, Concept of decision making, Power model and ripple effect of decision making.

TOTAL: 15 PERIODS

TEXT BOOK:

1. Dr. S. Ignacimuthu S.J., Values for life, Better yourself Books, Bandra Mumbai – 600 050 (1999)

REFERENCES:

1. Values (Collection of essays), Published by: Sri Ramakrishna Math., Chennai –4 (1996)
2. Prof. R.P. Dhokalia., Eternal Human Values NCERT – Campus Sri Aurobindo Marg., New Delhi – 10011.
3. Swami Vivekanda., Education. Sri Ramakrishna Math., Chennai – 4 (1957)
4. Tirukural (English Translation by Dr. G.U. Pope)
5. The Bible, The Kuran, The Bagavath Geetha
6. How to be Assertive in and situation – SUE HARFIELD – (Aug 2012)
7. Brilliant Memory Training – Jonathan Hancock – (Jun 2011)
8. Developing Entrepreneurial Life Skills – Vaidya Shipra.

AIM:

This course is devised to make students understand some basic materials of construction such as brick, clay products and timber and its various market forms.

OBJECTIVES:

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as brick and other clay products.

To inform the properties and characteristics of timber, its conversion, preservation and uses.

To inform of the various market forms of timber, their production, properties and application in the building industry.

CONTENT:**UNIT-I BRICKS 6**

Classification of bricks, characteristics, ingredients of bricks – Manufacture of bricks. Classification of bricks – Forms of bricks – Testing of bricks – Bonding in bricks and its types.

UNIT-II CLAY PRODUCTS 8

Manufacture of burnt clay bricks, paving bricks, hollow bricks – terracotta, porcelain, stoneware, earthenware and glazing and their uses.

Roofing materials - Manufacture and uses of Mangalore tiles, pot tiles, pan tiles

UNIT-III TIMBER AND TIMBER PRODUCTS 10

Classification of trees, structure of trees, Defects in timber, characteristics, seasoning of timber, Defects and diseases, Decay of timber, Preservation, Fire resistance, Conservation of timber, Storage of timber, Uses of timber of properties. Market forms of timber, Industrial timber, - Veneers, Plywoods, Laminates, advantages and Blockboard uses.

UNIT-IV LOW COST BUILDING TECHNOLOGY 6

Drawing of Brick jails, Screen walls – pavement blocks – Rat trap bonds – Laurie Baker's Techniques.

TOTAL: 30 PERIODS

TEXT BOOKS:

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

REFERENCES:

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

WEBSITES

<http://www.ibex-ibex-intl.com>

<http://www.inika.com/chitra>

<http://www.routbdge.com>

<http://www.venturaindial.com>

AIM:

To develop the skill of representation in advanced drawing techniques and building documentation.

OBJECTIVE:

To involve students in a number of exercises that will help them develop the skill of representation in advance drawing techniques involving sciography in perspective.

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.

CONTENT**UNIT-I SCIOGRAPHY 20**

Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.

UNIT-II PERSPECTIVE 20

Characteristic of perspective drawing. Concepts and methods of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes, simple one, two and three-point perspective of building interiors and exteriors. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

Introduction to short cut perspective method. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

UNIT-III MEASURED DRAWING 20

Combined study of historic document along with small building by using simple measuring tools like tapes, photograph etc.

Documentation of a complete building of a special interest in terms of history, building construction, architectural excellence or technology.

TOTAL: 60 PERIODS

REQUIRED READINGS:

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. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.
4. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975

REFERENCES:**MEASURED DRAWING:**

1. Claude Batley, Indian Architecture, D.B.Taraporevale Sons and Co., Ltd., Bombay
2. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
3. George A Dinsmore, Analytical Graphics – D.Van Nostrand, Company Inc., Canada.
4. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd., Japan, 1967.
5. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.
6. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
7. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.

AIM:

To introduce the technology of computer system, operation principles, use of other related hardwares with a thrust on advanced 2D Drafting techniques involving complex building drawings. To enhance them with rendering techniques for architectural presentations.

OBJECTIVES:

To inform the student, basics of operation system, (WINDOWS) application software.
To make students understand the basic tools of ACAD, 2D drafting of building drawings.
To create rendered plans, sections, elevations, Introduction to post processing of rendered images.
Introduction to sheet compositions and to use photoshop to compose architectural portfolios

UNIT-I EFFECTIVE USE OF MS OFFICE FOR BUSINESS ADMINISTRATION 10

Professional documents and User Inputs with MS Word – Data Processing & Analysis with Ms Excel – Business Presentations with MS PowerPoint – Template – Organizing and Protecting Documents – Business management with Microsoft Access – Communication with Microsoft Outlook

UNIT-II INTRODUCTION TO COMPUTER AIDED 2D DRAFTING 20

Understanding the use of drawing tools, object editing, drawing objects, filing and setting drawing units, scales, limits that size and dimensioning, texting.
Setting up of drawings of various simple architectural objects with complete text dimensioning.

UNIT-III ADVANCE COMPUTER AIDED 2D DRAFTING 25

Advance command programming - transparent overlays hatching utilities, assigned color and line type, use of multiline, style, block, symbol library manipulation for accurate drawing.
Advance exercise in 2D drafting of various complex building drawing, incorporating the above said utilities. Layout setting up, detailed drawings, scale, xref

UNIT-IV PRESENTATION DRAWINGS - INTRODUCTION TO PHOTOSHOP CS6 20

Getting started with layers, introduction to tools, colour correction, special effects, related exercises. Basic image editing, cropping, resizing, correcting, saving with Different File Formats. Exporting PDF file from Autocad to Photoshop and photoshop material rendering of plans and elevation for architectural presentation.

TOTAL: 75 PERIODS**TEXT BOOKS:**

1. Sham Tickoo, Advance Technique in AutoCAD 2010
2. MS OFFICE word – Turban Lage frandsen
3. Ms office 2007: Advance concepts and techniques – Shelly Cashman Series

REFERENCES:

1. V. Rajaraman, Principles of Computer Programming – Prentice Hall of India.
2. Auto CAD reference manual – Autodesk UNC, 1998.
3. AutoCAD architectural users guide – Autodesk Inc. 1998.
4. Sham Tickko, Understanding AutoCAD – 14 (Windows) – 1997.

AIM:

This course is devised to provide an understanding of brick and clay products and timber and industrial timber products that go into making of structural and non structural components of building. The basic planning standards for designing of stairs ease, from residence to commercial building.

OBJECTIVES:

To understand both in general and in detail the methods of construction by using basic materials such as brick, clay products and natural timber for both structural and nonstructural components.

To understand both in general and in detail the methods of construction by using man-made timber products such as ply wood.

To make drawing plates of staircase with details.

CONTENT:**UNIT-I BRICKS 10**

Design and construction of various structural components using bricks – basics of brick bonding principles, types of bonding, foundations, load bearing walls, cavity walls, lintels, arches, corbels, piers, flooring etc.

Exercises of the above and application of the design details of brick construction in single or (Ground+1) buildings – small house, community hall, snack bar etc. and understanding the same through case studies.

Methods of construction of various non-structural building components such as partition walls, screens, compound walls, parapets, coping.

Exercises of the above through drawings.

UNIT-II CLAY PRODUCTS 8

Clay block partition walls, screen walls, clay blocks for flooring and roofing. Roofing methods using Mangalore tiles, pot tiles, pan tiles.

Exercises involving the above through drawings.

UNIT-III TIMBER JOINERY, PARTITIONS, PANELING, FALSE CEILING 12

Methods of construction using natural timber in joinery works including methods of fixing and options for finishing.

Window types: paneled, pivoted, top hung, louvered, glazed, windows, French windows, corner windows, bay windows.

Door types: ledge-braced, paneled, glazed, sliding, sliding/folding, louvered

Ventilators: top hung, bottom hung, pivoted, louvered, glazed.

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.

Timber Partitions, paneling, false ceiling. Methods of construction using man-made timber products such as ply woods, block boards, and laminated wood and gypsum products, in fixed partitions, sliding/folding partitions, wall paneling, false ceiling.

Exercises of the above through drawings.

UNIT-IV TIMBER STAIRCASE AND CONCRETE STAIRCASE**15**

Types of staircases. Methods of construction of staircases, basic principles and design details including detailing of handrail and baluster. Basic planning stand for lifts and ramps for handicap.

Exercises involving the above through drawings.

UNIT-V TIMBER WALLS, FLOORS AND TRUSSES**15**

Methods of construction using natural timber in various structural components of the building such as walls, floors, roof trusses (lean to couple roofs, collar roof, king post, queen post and other trusses)

Exercises involving the above through drawings.

Quality assurance measures and testing procedures related to material, workmanship and performance for the above topics.

TOTAL: 60 PERIODS**REQUIRED READING:**

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

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, 2000
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

AIM:

To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.

OBJECTIVE:

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.

To enable Students to understand the importance of designing the built environment to suit the human behavior.

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. In all the design assignments due cognizance must be given to accessibility to differently abled users.

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

REQUIRED READING:

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

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, Van Nostrand Reinhold, 1995.

SEMESTER - III

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MECHANICS OF STRUCTURES - II

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CONTENT

UNIT-I SHEAR FORCE AND BENDING MOMENT

9

Concept of shearing forces and bending moments – Shear force and Bending Moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations

UNIT-II STRESSES IN BEAMS

9

Theories of simple bending – bending stresses in beams, shear stresses in beams – examples on simple sections. Stress distribution diagrams

UNIT-III DEFLECTION OF BEAMS

9

Slopes and Deflections at a section – Double Integration and Macaulay's method for simply supported and cantilever beams

UNIT-IV THEORY OF COLUMNS

9

Short and long columns – Euler's method and its limitations – Derivations of Euler's formula (for different end conditions) – Rankine's formula for columns, examples, effect of eccentric loading.

UNIT-V INTRODUCTION TO INDETERMINATE STRUCTURES

9

Determination of degree of static indeterminacy for beams and frames – Concept of Analysis (No Problems).

TOTAL: 45 PERIODS

REFERENCES:

1. R.K.Bansal "A text book on "STRENGTH OF MATERIAL" Laxmi publications, New Delhi 2006.
2. M.M.Ratwani, &V.N.Vazirani, Analysis, Vol.I, Khanna Publishers-Delhi, 1987.
3. Timoshenko, S.P., and D.H.Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.
4. A.R.Jain and B.K.Jain, Theory and analysis of Structures, Vol.I, Nemachand and Bros, Roorkee,1987
5. B.C.Punmia, 'Strength of Materials and Theory of structures', Vol.I,Laxmi Publications, New Delhi 1994
6. R.K.Rajput "Strength of Materials", S.Chand & Company Ltd., New Delhi 1996.

CONTENT

UNIT-I	ORGANIZATION OF FORMS AND SPACES	6
Articulation of forms spaces types – Edges and corners – Surfaces. Understanding perceptual effects of specific configuration of architectural spaces – Enclosure – Internal and External, Continuous spaces – Spatial relationship and its types, Spatial organisation: Centralized, Linear, Radial Clustered, Grid – built form and open space relationships.		
UNIT-II	PRINCIPLES OF COMPOSITION	6
Architectural Harmony, Unity and specific qualities of design to include dominance, punctuating effect, dramatic effect, fluidity, climax, accentuation of the path, path space, relationship, form of circulation space with examples.		
UNIT-III	WORKS OF CONTEMPORARY ARCHITECTS	8
Works of modern and post modern architects and their ideologies and philosophies towards architecture – Louis Sullivan, Frank Lloyd Wright, Louis I Khan, Le Carbusier, Philip Johnson, Charles Correa and Michael Graves.		
UNIT-IV	ARCHITECTURE AND HUMAN BEHAVIOR	4
Environment and Behavior studies in Architecture - Psychological Factors-Physical, Social, Cultural - Built Space, Privacy, Security, Interaction		
UNIT-V	ARCHITECTURAL DESIGN PROCESS	6
Integration of Elements, Principles of architecture in design-, Pre-Design Process-Understanding Data, Site Study, Analysis & Synthesis, Design Program, Design Process- Concept –Schematic Design- Design development.		

TOTAL: 30 PERIODS**REFERENCES:**

1. Sir Bannister Fletcher-A History of architecture, Butterworth's, London, 1987.
2. Francis D.K Ching, Architecture-Form, Space and Order, Van Nostrand Publications, New York, 1979.
3. Ernest Burden – Elements of Architectural Design- A Visual resource, Van Nostrand Reinhold, 1994.

UNIT-I ROMANESQUE**6**

The medieval ages - learning in the monasteries, evolution of the guilds - Factors influencing architecture - outline of architectural character if Italy, France and England - Examples: Pisa group, Italy Abbay aux Hommes, Caen, Tower of London.

UNIT-II FRENCH GOTHIC**4**

Religious and social influences - evolution of vaulting and development of structural systems - outline of Architectural character - Examples: Notre Dame, Paris.

UNIT-III ENGLISH AND ITALIAN GOTHIC**4**

Development of English gothic vaulting - outline of Architectural character in England and Italy - Examples: Westminster Abbey, Hampton Court Palace, London, Doges Palace, Venice, Milan Cathedral.

UNIT-IV ITALIAN RENAISSANCE**8**

The idea of rebirth and revival of art sociological influences in art and architecture - Development of thought, emergence of merchant communities and their patronage. Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace, eg. Palazzo Ricardi, Study of life history philosophy, contribution of the following architects; Bruaelleschi. Michelangelo, Andrea Palladio.

UNIT-V FRENCH & ENGLISH RENAISSANCE**8**

Outline of the architectural character of French and English Renaissance - Domestic Architecture in England - Study of the life, philosophy and works of the following architects: Sir Christopher Wren, Indigo Jones.

TOTAL: 30 PERIODS**REFERENCES:**

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

WEBSITES

<http://www.clr.tomoto.edu> - virtual lib.
<http://www.lib.virginia.edu/> - Renaissance and baroque
<http2.siis.umich.edu/> - Image browser

AIM:

The course is designed to familiarize the students with building services that support the functioning of a building in the area of water supply and sewerage

OBJECTIVES:

To study water quality control and treatment and its distribution within a building

To expose the students to water management concepts

To understand the fundamentals of waste disposal from a building and the guidelines for planning a sewerage system.

To expose the students to waste management concepts.

To familiarize the students with equipment for management of usable water and waste water

CONTENT:**I. WATER SUPPLY AND WATER DISTRIBUTION SYSTEM****UNIT-I WATER QUALITY CONTROL AND DISTRIBUTION SYSTEM 10**

Water quality, purification and treatment – surface and ground water sources, water/quality – nature of impurities, treatments - sedimentation, Rapid sand filters, pressure filters – sterilization and disinfection.

Water distribution systems

Distribution systems in small towns, layouts – cold water lines, hot water lines, Design criteria for daily water requirements based on occupancy, various kinds of meters, Tank capacity - Pumping plant capacity, Testing of water hardness - calculation of water consumption for Residential/Multistoried buildings Piping systems/piping materials/plumbing fixtures/selection – Domestic hot water systems Solar water heating systems, application and installation

UNIT-II WATER MANAGEMENT CONCEPTS 8

Different methods of Harvesting rain water from roofs and paved areas

Waste water treatment – conventional, modern systems

Mandatory provision with respect to plumbing arrangements in apartment buildings.

II. SANITARY WASTE AND SEWERAGE SYSTEM**UNIT-III FUNDAMENTALS, SANITARY WASTE AND SEWERAGE SYSTEM 11**

Basic Principles of sanitation and disposal of waste matter from buildings, various systems of sewerage disposal and their principles

Model bye-Laws in regard to sanitation of buildings specifications of various sanitary fittings for buildings.

Planning of bathrooms, Toilets in domestic and Multistoried buildings. Standard type of sanitary fittings, Caulking compounds, traps, joints.

Flushing cisterns, manholes, septic tanks in relation to buildings. Intercepting Chambers, inspection Chambers and their location and ventilation of sewers.

Layout of simple drainage system for small buildings, apartments, commercial buildings – gradient used in laying of drains and sewers, size of drain pipes and materials used

UNIT-IV WASTE MANAGEMENT CONCEPT

8

Sewerage disposal:

Primary, secondary treatment, activated sludge, intermittent and trickling sand filters, sewage treatment plant – layout for residential/commercial buildings

Solid waste disposal:

Refuse disposal, collection, and conveyance disposal of town refuse. Sanitary land fills, incineration, vermiculture, aerobic digestion for compost, anaerobic digestion for energy and organic filler (Bio gas) and rural energy systems

UNIT-V EQUIPMENT'S USED FOR MANAGEMENT OF USABLE WATER AND WASTE WATER

8

Space requirements, Configuration and Sizing of motors and deep well, centrifugal, +submersible, reciprocating pumps and their location in building types.

TOTAL: 45 PERIODS

REFERENCES:

1. G.M. Fair, J.C.Geyer and D.Okun, water and waste water Engineering, Vol.II. John Wiley & Sons, Inc., New York, 1968.
2. Manual of water supply and Treatment, second Edition, CPHEEO, Ministry of Works and Housing g, New Delhi, 1977.
3. Manual on Sewerage and Sewage Treatment, CPHEEO, Ministry of Works and Housing, New Delhi, 1980.
4. S.C.Rangwala, Water Supply and Sanitary Engineering, Charotar Publishing House, Anand 388, 601, 1989.

UNIT-I CEMENT**5**

Varieties of cement, composition, properties and uses - brief study on manufacture of Portland cement - tests for cement - mortar for various works.

UNIT-II CONCRETE, IT'S INGREDIENTS MANUFACTURE & PROPERTIES**10**

Ingredients - suitability requirements for aggregates, grading of aggregates - role of water in concrete - reinforcement - admixtures - properties of concrete.
Manufacture of concrete and concreting - mix proportioning - batching, mixing, transporting, placing, compaction, curing formwork - quality control - outline of tests for concrete - joints in concrete - concrete finishes.

UNIT-III SPECIAL CONCRETE AND CONCRETING METHODS**5**

Lightweight, high density, fibre reinforced, polymer concrete - outline of manufacture properties and uses of the above - ready mixed concrete - guniting - cold weather and underwater concreting - current developments in concrete products and methods of concreting.

UNIT-IV CONCRETE CONSTRUCTION**5**

Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap. Concrete floors, walls and partitions. Concrete lintels, arches, sunshades
Concrete slabs - types - concrete beams and columns.

UNIT-V CONCRETE STAIRCASES**5**

Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations finishes for staircases - detailing out of handrails and balusters. Designing detailing for physically handicapped.

TOTAL: 30 PERIODS**REFERENCES:**

1. M.S.Shetty, Concrete Technology, S.Chand & Co. Ltd., New Delhi, 1986.
2. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
3. Dr.B.C.Punmia, Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 1993.
4. Arthur Lyons - Materials for Architects and Builders - An introduction Arnold, London, 1997.
5. Don A.Watson, Construction Materials and Process, McGraw Hill Co., 1972.
6. Jack M.Launders, Construction Materials and Methods, Careers, South Holland, Illinois, Wilcox Co.Ltd., 1986.
7. W.B.Mckiy Building Construction, Longmans, UK, 1981.
8. Francis D.K.Ching, Building Construction Illustrated VNR, 1975.
9. Alan Banc, Stairs, Steps and Ramps, Butterworth Heinemann Ltd., 1996.

WEBSITES

<http://dir.yahoo.com/Business-and-Economy/companies/construction/concrete/materials>

PURPOSE:

The purpose of this course is to build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential.

INSTRUCTIONAL OBJECTIVES:

1. To guide thought process.
2. To groom students' attitude.
3. To develop communication skill.
4. To build confidence.

METHODOLOGY

The entire program is designed in such a way that every student will participate in the class room activities. The activities are planned to bring out the skills and talents of the students which they will be employing during various occasions in their real life.

1. Group activities+ individual activities.
2. Collaborative learning.
3. Interactive sessions.
4. Ensure Participation.
5. Empirical Learning.

CONTENT: SEMESTER1-2(HRS) – AUDIT COURSE

1. Self-analysis SWOT
2. Time management
3. Creative chain story telling.
4. Vocabulary games I
5. Attitude
6. Interpersonal skills.
7. Motivation I
8. Vocabulary games II
9. Article review.
10. Team building exercise
11. Critical Thinking
12. Even Management
13. Business situation
14. Leadership Qualities
15. Reviews

SCHEME OF INSTRUCTION

Marks allocated for regular participation in all oral activities in class.

SCHEME OF EXAMINATION

Complete internal evaluation on a regular Basis.

TOTAL: 30 PERIODS

AIM:

To make use of more advanced features that will make 2D Architectural drawing to a 3D VIEW so that we can visualize our design and To enhance them with rendering techniques for architectural presentations.

OBJECTIVES:

Introduce basic tools and create an understanding of working with levels.

Apply this knowledge to create 3 dimensional views , and massing of building

Introduction to post processing of 3d rendered building views .

Introduction to sheet compositions and to use Revit architecture to compose architectural design panels and site views , perspective views of the buildings

UNIT-I INTRODUCTION TO REVIT ARCHITECTURE 20

Introduction, Building Information Modelling, Revit Architecture, Projects, Project Templates

Revit File Types, Exploring the User Interface, Revit Elements and Families, study of Levels, study of Wall Properties and its application.

UNIT-II REVIT ARCHITECTURE EDITING COMMANDS, COMPONENTS, DIMENSIONS 25

Editing and modifying Commands, study of Components, Introduction to Modern Medium Library. Managing Views - Floor Plan View, Ceiling Plan View, Cutting a Plan View, Plan Region, Elevation View, Section View, 3D Views, Cropping a View, Visibility and Graphics Display, View Templates Dimensions -Constraints .

UNIT-III CREATING FLOOR, ROOF AND OPENINGS IN REVIT ARCHITECTURE 15

Floors - Creating Floors, Placing Elements on a Sloped Floor, Ceilings, Creating Ceilings

Roofs - Roof by Footprint, Roof by Extrusion, Join/unjoin roofs, Roof Ridges

Openings - On Face, Vertical Opening, Shaft opening, Dormer opening, Wall opening

UNIT-IV CREATING & MODIFYING CURTAIN WALLS & STAIRS IN REVIT ARCHITECTURE 15

Curtain Walls - Creating Curtain Walls, Curtain Grids, Mullions, Reshaping Curtain Wall Panels, Merging Curtain Wall Panels, Adding Curtain Door Panel, Embedded Walls

Stairs - Creating Stairs, Stair Calculator, Modifying Stairs, Stair Properties, Ramp, Railing,

TOTAL: 75 PERIODS

TEXT BOOKS:

1. Autodesk Revit 2017 for Architecture

REFERENCES:

1. Mastering Autodesk Revit Architecture 2011.

AIM:

To make the students understand about the various structural components of the building.
 To understand and make the drawing for the structural systems along with the reinforcements.
 It aims at developing the students understanding of material properties and construction techniques of concrete, RCC and special concreting methods and appropriate material and technology.

OBJECTIVES:

To advise to the students about the details of different components along with the steel reinforcements and to make them the drawing plates for the above details.
 To expose the students the preparation of concrete mix placing and curing. Concrete construction methods and special concrete and concreting methods.
 To expose to students to appropriate material Construction method.

UNIT-I	CONCRETE FOUNDATION	15
Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap.		
UNIT-II	CONCRETE FLOORS & WALLS	15
Concrete floors, walls and partitions, Walls retaining wall, swimming pool, septic tank, shear wall.		
UNIT-III	CONCRETE SLABS & BEAMS	12
Concrete lintels, arches, sunshades, beam, loft, Concrete slabs - types - concrete beams and columns.		
UNIT-IV	CONCRETE STAIRCASES	18
Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations finishes for staircases - detailing out of handrails and balusters. Designing detailing for physically handicapped.		

TOTAL: 60 PERIODS**TEXT BOOKS:**

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, 2001.
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

REFERENCE BOOKS:

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. Barry, Construction of Buildings, Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005
5. R. Chudley, Construction Technology, Richard Clay, Chanur Press, 1980

AIM:

To create an understanding of the inter relationships amongst various elements of architecture – form, function, space planning, user perception and behaviour.

OBJECTIVES:

To enable Students to understand the importance of designing the built environment to suit the human behavior.

To understand the characteristics of site and the importance of site planning which includes built form and open space.

To understand the relationship between form and spaces and the importance of aesthetics.

To ascertain the response of user group through case studies.

To enable the presentation of concepts through 2D drawings, sketches and model.

DESIGN STUDIO

Single level planning in small scale, small span, horizontal movement and simple vertical movement, data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for physically handicapped persons – Concepts and presentation of design with scaled models – Examples: Residential buildings, institutional buildings, banks, nursery or primary schools, primary health center, school for children with learning disabilities, neighborhood market.

TOTAL: 180 PERIODS

REFERENCES:

1. De Chiara and Callendar, Time saver Standards Building Types, Mcgraw Hill co., 2nd Edition, 1980.
2. Edward D.Mills, Planning – The Architects Handbook – 10th Edition, British Library C Taloguing in Publication Data, 1985.
3. Wakita Linde, The Professional practice of Architectural working, drawing John Wiley & Sons, 1984.
4. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw Hill Book Co., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design Publication, 1979.
6. Neufet Architect's Data, Rudoll Herg, Crosby Lockwood and Sons Ltd., 1970.

WEBSITES

<http://www.hamptons.com/freshair>

<http://www.columbiamedical.com>

<http://www.mgarchitects.com>

SEMESTER - IV

BCE17A03	DESIGN OF STRUCTURES – I	L T S C 3 0 0 3
UNIT-I	TIMBER	5
Design requirements from National Building Code, Design of Madras Terrace roof.		
UNIT-II	STEEL SECTIONS AND RIVETED JOINTS	10
Properties of rolled steel sections, riveted joints, Analysis and Design of riveted joints (Excluding eccentric connections)		
UNIT-III	WELDED JOINTS	10
Types of welding, permissible stresses, Design of fillet welds (excluding eccentric connections)		
UNIT-IV	STEEL BEAMS	10
Allowable stresses, General specifications, Design of laterally supported beams.		
UNIT-V	STEEL COLUMNS	10
Allowable stresses, various shapes, built-up sections, Design of columns (excluding lacing, battening and other connections.		
TOTAL: 45 PERIODS		

REFERENCES:

1. N. Subramaniam” Design of steel Structures” OUP India, 04 Sep 2008 – Technology & Engineering.
2. S.S Bhavikatti “Design of steel structures” I.K International Publishing Housing Pvt Ltd Delhi.
3. Ramachandra S., Design of Steel Structures, Standard Book House, Delhi, 1984.
4. A.S. Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
5. National Building Code of India, 1983, Part VI, Structural Design.
6. Gurucharan Singh, Design of Steel structures, Standard Publishers, New Delhi, 1982.
7. Negi “Design of steel Structures” – Tata Mcgraw Hill Book Company, Delhi 1997.

UNIT-I INTRODUCTION TO ISLAMIC ARCHITECTURE 6

Brief History of Islam in terms of birth, spread across countries and principles – influences on Islamic Architecture – Evolution of Building types in terms of forms and functions – the mosque, the tomb and the minaret, the madrasa, the palace, the caravanserai, vernacular architecture, the market – important principles, elements & character of Islamic architecture in decoration, color, geometry, light – important examples to illustrate development of Islamic architecture.

UNIT-II ISLAMIC ARCHITECTURE IN INDIA ARCHITECTURE OF DELHI SULTANATE 7

Advent of Islam into the Indian subcontinents and its impact. Source of Islamic Architecture in India and influences on them – Brief history of development and classification of Urban, different styles and region. Development of architectural styles during the rule of the Slave, Khalji, Tuqlap, Sayyid and Lodhi Dynasties – important examples of each period.

UNIT-III PROVINCIAL STYLE 6

Development of the provincial styles in different regions – Punjab, Jaunpur, Bengal, Gujarat, Malwa, the Deccan (Bijapur, Golconda, Bidar and Gulbarga) – important examples for each style.

UNIT-IV MUGHAL STYLE 6

Development of the Mughal style under the different rulers – Babur, Shershah, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb – important examples – development of the Mughal garden – important examples.

UNIT-V CROSS-CULTURAL INFLUENCES 5

Cross cultural influences across India and secular architecture of the princely states: Oudh, Rajput, Sikh, Vijayanagara, Mysore, Madurai- important examples

TOTAL: 30 PERIODS**REFERENCES:**

1. Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons, Bombay, 1983.
2. Christopher Tadgell – The History of Architecture in India – Penguin Books (India) Ltd., New Delhi 1990.
3. Architecture of the Islamic World – George Michel –its history and social meaning. Thames and Hudson, London, 1978.
4. Islamic Architecture, Form, Function and Meaning, Robert Hillenbrand, Edinburgh University Press, 1994.
5. Satish Grover. The Architecture of India (Islamic) Vikas Publishing House Pvt.Ltd., New Delhi, 1981.
6. R.Nath – History of Mughal Architecture – Abhinav Publications – New Delhi, 1985

WEBSITES

<http://www.islamicart.com/pages/archcrea/index.html>
<http://libraries.mit.edu/rvc/aka/agakhan/index.html>
<http://www.greatbuildings.com/types/styles/Islamic.html>
<http://www.ets.uidaho.edu/arch499/nonwest /islam1.html>
<http://indiagateway.com/culture/architecture.html>

UNIT-I PUMPS AND MACHINERIES**9**

Reciprocating, centrifugal, deepwell, submersible automatic pumps, sewerage pump, compressors vacuum pump-their selection, installation and maintenance - Hot Water Boiler - Lifts and Escalators - special features required for physically handicapped and elderly - Conveyors -Vibrators - Concrete mixers - DC /AC motors - generators - Laboratory services - gast, water, air and Electricity.

UNIT-II ELECTRICAL SYSTEMS**9**

Basics of electricity - single / Three phase supply - Protective devices in electrical installations - Earthing for safety - Types of earthing-ISI Specification.

UNIT-III ELECTRICAL INSTALLATIONS IN BUILDINGS**9**

Type of wires, wiring systems and their choice - Planning electrical layout wiring for building - Main and distribution boards - transformers and switch gears - Layout of substations.

UNIT-IV PRINCIPLES OF ILLUMINATION**9**

Visual Tasks- factors affecting visual tasks - Modern theory of light and colour - Synthesis of light - Additive and subtractive synthesis of colour -luminous flux - Candela - Solid angle illumination - Utilisation factor -depreciation factor - MSCP - MHCP - Lans of illumination.

UNIT-V LIGHTING DESIGN**9**

Classification of lighting - Artificial light sources - spectral energy distribution - luminous efficiency - colour temperature - colour rendering. Design of modern lighting - Lighting for stores, offices, schools, hospitals and house lighting. Elementary idea of special features required and minimum level of illumination requited for physically handicapped and elderly in building types.

TOTAL: 45 PERIODS**TEXT BOOKS:**

1. "Handbook for Building Engineering in Metric systems", NBC, New Delhi.

REFERENCES:

1. E.R. Ambrose, "Hear Pumps and electric heating", John and Wiley and Sons, Inc., New York, 1968.
2. "Philips Lighting in Architectural Design", McGraw Hill, New York, 1964.
3. R. G. Hopkinson and J. D. Kdy, "The Lighting of buildings", Faber and Faber, London, 1969.

UNIT-I CLIMATE AND THERMAL SENSATION**9**

Factors that determine climate Components of climate - Characteristics of climate types – Body heat balance - Effective temperature - Comfort zone.

UNIT-II SOLAR CONTROL**9**

Solar geometry - Solar chart - Sun angles and shadow angles - Design of solar shading devices.

UNIT-III HEAT FLOW THROUGH BUILDING ENVELOPE CONCEPTS**9**

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

UNIT-IV IMPACT OF AIR MOVEMENT DUE TO NATURAL AND BUILT FORMS**9**

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.

UNIT-V SHELTER DESIGN IN TROPICS**9**

Design considerations for warm humid, hot dry, composite and upland climates – Heavy rainfall regions - landscape and climatic design, Introduction to software based energy analysis of buildings.

TOTAL: 45 PERIODS**REFERENCES:**

1. O.H.Koenigsberger and others, Manual of Tropical Housing and Building - Part I - Climatic Design, Longmans, London, 1980.
2. M.Evans - Housing, Climate and Comfort - Architectural Press, London, 1980.
3. B.Givoni, Man, Climate and Architecture, Applied Science, Banking, Essex, 1982.
4. Donald Watson and Kenneth Labs., Climatic Design - McGraw Hill Book Company - New York- 1983.
5. Climate Responsive Architecture- A Design Handbook for Energy Efficient Buildings, Arvind Krishnan, Szokolay et.al, Tata McGraw Hill, 2010.

WEBSITES

<http://www.envinst.conu.edu~envmst/research/built.html>

<http://Www.terin.org/>

<http://www.pge.com/pec/archives/w98passi.html>

UNIT-I FERROUS METALS**8**

Brief study on manufacture, properties and uses of cast iron, wrought iron, pig iron and steel - anticorrosive measures for steel - mechanical and heat treatment of steel - market forms of steel - structural steel, stainless steel, steel alloys - properties and uses - current developments.

UNIT-II NON FERROUS METALS**8**

Aluminium and Aluminium Alloys - brief study on manufacture, properties and uses -Aluminium products - extrusions, foils, castings, sheets, etc. - brief study of other non-ferrous metals like copper, bronze, brass, tin and lead, properties and uses - current developments.

UNIT-III GLASS**8**

Composition of glass - brief study on manufacture, treatment properties and uses of glass -special types of glass, sheet glass, plate glass, safety glass, tinted and coated glass - glass blocks - properties and applications in the building industry - current developments.

UNIT-IV PLASTICS**6**

Thermoplastics and thermosets - properties and architectural uses of plastics - structural plastics - reinforced plastics and decorative laminates - plastic coatings, adhesives and sealants - modifiers and plasticizers - fillers and stabilizers - fabrications of plastics Primary plastic building products for walls, roofs and partitions — secondary building products for rooms, windows, roof lights, domes, gutters hand rails.

TOTAL: 30 PERIODS**REFERENCES:**

1. S.C. Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
2. B.C.Punmia, Building Construction, Lax
3. mi Publications Pvt. Ltd, New Delhi, 1993.
4. Arthur Lyons - Materials for Architects and Builders - An Introduction - Arnold, London, 1997.
5. Don A. Watson, Construction Materials and processes, McGraw Hill Col, 1972.
6. Harold B.Glin, Construction Principles Materials and Methods, The Institute of Financial Education, Chicago, 1980.
7. W B.Mckay Building Construction, Longmans, U.K. 1981.
8. Time Saver Standards for Architectural Design Data, Callendar JH, McGraw Hill, 1974.

WEBSITES

<http://www.britmatfed.org.uk/frmedu.html>;
<http://www.indiabusinessonline.com>;
<http://www.nrwasc.com>;
<http://www.arcadiaproducts.com>;
<http://www.sail.com.in>

AIM:

To enable the appreciation of site and its elements and to equip students with the various types of techniques of site surveying as well as to introduce them to aspects of site planning and site analysis

OBJECTIVES:

To teach various techniques of site surveying

To teach the importance of site and its content in architectural creations

To orient the students towards several influencing factors which governs the sitting of a building or group of buildings in a given site.

To teach the students the methodology of preparing a site analysis diagram. This will serve as a prelude to any architectural creation.

CONTENT:**UNIT-I INTRODUCTION****6**

Definition of plot, site, land and region, units of measurements, reconnaissance and need for surveying.

UNIT-II SITE SURVEYING**14**

Chain survey and Triangulation – Instruments used, method of survey and plotting into survey drawing, plain table, Compass and Theodolite Surveys, method, instruments used and application.

Computation of area by geometrical figures and other methods. Marking plans, layout plans and centerline plans – Importance, procedure for making these drawings and dimensioning. Setting out the plan on site – Procedure and Precautions.

UNIT-III SITE ANALYSIS**14**

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. Site selection criteria for housing development, commercial and institutional projects.

UNIT-IV DETAILED ANALYSIS AND TECHNIQUES**12**

Context of the site. Introduction to existing master plans land use for cities, development control Rules. Study of contours, slope analysis, grading process, grading criteria, functional and aesthetic considerations.

UNIT-V SITE PLANNING AND SITE LAYOUT PRINCIPLES**14**

Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections Study of microclimate; vegetation, landforms and water as modifiers of microclimate.

TOTAL: 60 PERIODS**REFERENCES:**

1. "Site Analysis and Planning" by White.
2. Kevin Lyunch – Site planning – MIT Press, Cambridge, MA – 1967.
3. B.C. Punmia – Surveying Vol.I – Standard Book House, New Delhi – 1983.
4. P.B. Shahani – Text of surveying Vol. I, Oxford and IBH Publishing Co – 1980 .
5. Joseph de.Chiarra and lee Copleman – Planning Design Criteria – Van Nostrand Reinhold Co., New York – 1968.

UNIT-I STEEL CONSTRUCTION – ROOFS 10

Structural steel sections - types of connections in steel - steel in foundations, columns and beams - different types of steel roof trusses including north light truss - space frames -materials for roof covering.

UNIT-II STEEL CONSTRUCTION – DOORS AND WINDOWS 15

Steel staircases and handrails, balusters. Steel doors and windows - open able, sliding - collapsible gates - rolling shutters. Steel in furniture and other interior uses.

UNIT-III CONSTRUCTION USING NON-FERROUS - ALUMINIUM DOORS, WINDOWS & VENTILATORS 20

Aluminium doors - openable, sliding, pivoted. Aluminium windows - openable, sliding, fixed, pivoted. Aluminium ventilators - tophung, bottom hung, pivoted, louvred, fixed. Aluminium partitions, false ceiling, handrails.

UNIT-IV ONSTRUCTION USING NON-FERROUS METALS – ALUMINIUM ROOFING 15

Aluminium roofing – northlight glazing bar, aluminium roofing sheets. Use of other nonferrous metals like copper, bronze, brass, etc. in architectural construction, curtain walling.

TOTAL: 60 PERIODS**TEXT BOOKS:**

1. Dr. B.C.Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2001.
2. Z.T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
3. Practical handbook on building construction; Nabhi Publication, M.K.Gupta.
4. Fundamentals of Building Construction: Materials & Methods, Edward Allen, Joseph Iano, Wiley

REFERENCE BOOKS:

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

AIM:

To create a holistic understanding of the socio-cultural, geographic and economic aspects that shape the built environment as well as to expose the students towards the design of simple community oriented buildings.

OBJECTIVES:

To make a comprehensive study of a rural settlement that is an exemplar of collective design evolved organically over a period of time.

To expose the students on the methodology of conducting various surveys covering, physical, visual characteristics and demographic aspects.

To understand the vernacular / traditional architecture involving local materials and construction techniques.

To emphasise on the importance of designing built form and open spaces that meet the aspirations of the community.

To enable the presentation of concepts through 2D and 3D presentation including sketches and model.

UNIT-I DESIGN STUDIO

Problem related to multi room, single use, small span – multi story, Horizontal and vertical movement, active cum passive energy, masonry and framed type buildings. Departmental store, library, higher secondary school, campus students center, etc. the projects will consciously provide for movement and use by the physically handicapped and elderly

UNIT-II DESIGN STUDIO – RURAL PROJECT

Problems related to rural housing – visits to selected village – surveys on socio - economic, physical, and housing and surveys, etc. to study existing conditions – analysis of survey data – preparation of report and presentation in a seminar – preparation of design brief solutions for housing and community facilities.

UNIT-III DESIGN STUDIO

Time Problem

TOTAL: 210 PERIODS

REFERENCES:

1. De Chiara and Calendar, Time Saver Standard for Building Types, McGraw Hill Co., 2nd Edition, 1980.
2. Edward D.Mills, Planning – The Architects Handbook – 10th Edition, British Library Cataloguing in Publication Data, 1985.
3. Wakita\Linde, The Professional Practice of Architectural Working, Drawing John Wiley & Sons, 1984.
4. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw Hill Book Co., 1982.
5. Julius Panero & Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design Publication, 1979.
6. Neufert Architect's Data, Rudolf Herg, Crosby Lockwood and Sons Ltd., 1970.

WEBSITES

<http://www.focusnet.co.uk/cib/library/physdishous94.htm>

<http://www.ourvirtualmall.com/cloth.htm>

<http://www.ddimagezine.com/>

<http://www.atlasmagazine.com/photo/lande6/>

SEMESTER - V

BCE17A04

DESIGN OF STRUCTURE - II

**LTSC
3003**

REINFORCED CEMENT CONCRETE STRUCTURES

UNIT-I PROPERTIES OF STEEL CONCRETE

5

Structural properties of concrete - Grades and Strength of Concrete - durability - code provisions and design requirements of steel and concrete.

UNIT-II WORKING STRESS DESIGN METHOD

8

Introduction to Elastic Theory - basic concepts - stress / strain relationships, design of singly reinforced beams - merits and demerits of the method - pcode requirements.

UNIT-III LIMIT STATE DESIGN - INTRODUCTION

8

Various Limit stages - characteristic load and characteristic strength of materials - partial safety factor - stress / strain relationship of steel and concrete - safety and serviceability requirements.

UNIT-IV LIMIT STATE DESIGN OF BEAMS

12

Analysis and Design of rectangular sections for bending - singly reinforced, doubly reinforced and flanged sections.

UNIT-V LIMIT STATE DESIGN OF SLABS

12

Design of one way and two way slabs using IS Code co-efficient for various edge conditions.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. P. Dayaratnam, "Design of Reinforced Concrete Structures", Oxford and IBH Publishing Co., 1983.
2. REFERENCES:
3. N.C. Sinha and S.K. Roy, "Fundamentals of Reinforced Concrete", S.Chand & Co., New Delhi. 1993.
4. S.N. Sinha, "Reinforced Concrete Design" Tata McGraw Hill, New Delhi 1998.
5. Dr. B. C. Punmiya, "Reinforced Concrete Structures" Standard Laxmi -publication, Delhi, 1994.

UNIT-I LEADING TO A NEW ARCHITECTURE**6**

Historical overview - Origins of Neo-Classicism: Enlightenment Architects - Boullée and Ledoux: Beginning of New era - Industrial Revolution & its impact: Materials & Technology - History of Steel, concrete and glass.

UNIT-II REVIEWING INDUSTRIALIZATION**4**

Architecture in Industrial Exhibition: Arts and Crafts Movement in Europe and America - Art Nouveau and the works of Gaudí, Horta, Guimard, Macintosh: Early works of F.L. Wright.

UNIT-III ISSUES OF ORNAMENTATION AND AESTHETICS**8**

Adolf Loos and the Arguments on Ornamentation - Futurists Movement Manifestos and the works of Sant'Elia - Expressionism and the works of Mendelsohn, Taut, Polzeig - Cubism and Constructivism and its influence on Architecture - De Stijl: Ideas and works.

UNIT-IV INSTITUTIONS**6**

Werkbund and Bauhaus, Works of Behrens and Gropius - Canonising Modernism- International Style - CIAM Congresses and Declarations. Works and Ideas – Le Corbusier- Mies - Later Works of Wright - Alvar Aalto

UNIT-V ARCHITECTURE IN COLONIAL INDIA**6**

Colonialism and its impact, Early British Neo - classical Architecture, Indo - Saracenic Architecture and the works of Chisholm, P.W.D. and the Institutionalisation of Architecture, Building New Delhi.

TOTAL: 30 PERIODS**TEXT BOOKS:**

1. Kenneth Frampton, "Modern Architecture": A Critical History, Thames and Hudson, London, 1994.
2. Modern Design - "Architecture after Independence".
3. REFERENCES:
4. Leonardo Benevolo, "History of Modern Architecture", 2 Vols., Routledge & Kegan Paul, London, 1971.
5. Manfredo Tafel/Francesco Dal Co., "Modern Architecture", Faber and Faber/ Electa, 1980.
6. Sigfried Giedion, "Space Time and Architecture": The Growth of a New Tradition, Harvard University Press, 1978.
7. Thomas Metcalf, "An Imperial Vision", Faber and Faber, London. 1989.

AIM:

To familiarize the students with building services that support the functioning of a building in the area of internal environment control and fire and security systems.

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 fire fighting equipment and their installation.

CONTENT:**UNIT-I AIR CONDITIONING: BASIC REFRIGERATION PRINCIPLES 9**

Thermodynamics – Heat – Temperature – Latent heat of fusion – evaporation, saturation temperature, pressure temperature relationship for liquid refrigerants, 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 – window types, evaporative cooler, packaged terminal units and through the wall units split system

b) Systems for 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 6

Design criteria for selecting the Air conditioning system for large building and energy conservation measures - Typical choices for cooling systems for small and large buildings - Horizontal distribution of services for large buildings - Grouped horizontal distribution over central corridors, Above ceiling, In floor, Raised access floor, Horizontal distribution of mechanical services

UNIT-IV FIRE SAFETY: DESIGN AND GENERAL GUIDELINES OF EGRESS DESIGN 10

Principles of fire behavior, Fire safety design principles _ NBC Planning considerations in buildings – Non- Combustible materials, egress systems, Exit Access – Distance between exits, exterior corridors – Maximum travel distance, Doors, Smoke proof enclosures General guidelines for egress design for Auditoriums, concert halls, theatres, other building types, window egress, accessibility for disabled- NBC guidelines – lifts lobbies, stairways, ramp design, fire escapes and A/C, electrical systems.

UNIT-V FIRE SAFETY: FIRE DETECTION AND FIRE FIGHTING INSTALLATION 8

Heat smoke detectors – sprinkler systems

Fire fighting pump and water requirements, storage – wet risers, Dry rises

Fire extinguishers & cabinets

Fire protection system – CO₂ & Halon system

Fire alarm system, snorkel ladder

Configuring, sizing and space requirements for fire fighting equipments

TOTAL : 45 PERIODS

TEXT BOOKS:

1. William H. Severns and Julian R. Fellows, "Air conditioning and Refrigeration", Hohn Wiley and Sons, London, 1988.
2. REFERENCES:
3. A.F.C. Sjerratt. "Air conditioning and Energy Conservation", The Architectural Press, London.
4. "National Building Code".

UNIT-I VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS**8**

Elevators - Historical development of elevators or lifts. Elevators - size, capacity, speed, mechanical safety method, positioning of core under planning grid. Types of elevators - Electric, hydraulic - passenger, hospital, capsule, freight, etc. Dumb waiters, details of lift shaft and other mechanism. Detailing and fitting for physically handicapped.

UNIT-II ESCALATORS AND CONVEYORS**8**

Parallel and criss - cross escalators, horizontal belt conveyors, horizontal moving walkways - for physically handicapped mechanical safety systems and automatic control.

UNIT-III CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATION**10**

Study of construction system innovated through research organisations like CBRI, NBO, SERC, etc. Floor wall and roofing systems.

Ferrocement its properties, uses and application in building construction including the techniques of preparation, casting, curing, etc.

UNIT-IV FOUNDATIONS**9**

Pile foundation, different types of piles, precast and cast in situ with reinforcement details for different types of grids, details of pile capping, jointing of precast piles and columns.

UNIT-V MISCELLANEOUS STRUCTURES**10**

Shell structures, domes, space frame, shell barred vault, folded plate structures, tensile structures, pneumatic structures, etc

TOTAL : 45 PERIODS**REFERENCES:**

1. James Ambrose, Building Construction, Service Systems, Van Nostrand Reinhold, New York, 1992.
2. J.H. Callender, Time Saver Standard for Architectural Design Data, McGraw Hill, 1994.
3. Pamphlets supplied and other literatures from N.B.O., SERC, CBRI, 1970 onwards.
4. R. Chudley, Construction Technology, Richard Clay (Chaucer Press) Ltd., Suffolk, 1978.

WEBSITES

<http://www.nas.otis.com>

<http://www.hugo.lib.ryerson.ca/marion>

<http://www.ibex.intl.com>

<http://www.tridelta.com>

<http://www.pilebrick.com>

UNIT-I FUNDAMENTALS**8**

Sound waves, frequency, intensity, wave length, measure of sound, decibel scale, speech and music frequencies, human ear characteristics - Tone structure.

UNIT-II SOUND TRANSMISSION AND ABSORPTION**12**

Outdoor noise levels, acceptable indoor noise levels, sonometer, determinate of density of a given building material, absorption co-efficients and measurements, choice of absorption material, resonance, reverberation, echo, exercises involving reverberation time and absorption co-efficient.

UNIT-III NOISE CONTROL AND SOUND ABSORPTION**10**

Types of noises, transmission of noise, transmission loss, noise control and sound insulation, remedial measures and legislation.

UNIT-IV CONSTRUCTIONAL MEASURES**15**

Walls/partitions, floors/ceilings, window/doors, insulating fittings and gadgets, machine mounting and insulation of machinery,

UNIT-V ACOUSTICS AND BUILDING DESIGN**15**

Site selection, shape, volume, treatment for interior surfaces, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls and theatres.

TOTAL: 60 PERIODS**TEXT BOOKS:**

1. B.J. Smith, R.J. Peters, "Stephanie Owen - acoustics and Noise" Control -Longman Grou Ltd., - New York, USA-1982.

REFERENCES:

1. Dr. V. Narasimhan - "An Introduction to Building Physics" - Kabeer printing Works, Chennai - 5.1974.
2. D.J. Groomet - "Noise, Building and People" - Pergumon Press - 1997.
3. Thomas D. Northwood - "Architectural Acoustics" - Dowden, Hutchinson and Ross Inc. 1997.
4. <http://www.soundesigns.net><http://www.acs-psu.edu>

UNIT-I VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS**20**

Plates on positioning of core under planning grid. Types of elevators - Electric, hydraulic - passenger, hospital, capsule, freight, etc. Dumb waiters, details of lift shaft and other mechanism. Detailing and fitting for physically handicapped.

UNIT-II ESCALATORS AND CONVEYORS**20**

Plates on parallel and criss - cross escalators, horizontal belt conveyors, horizontal moving walkways - for physically handicapped mechanical safety systems and automatic control.

UNIT-III FOUNDATIONS**10**

Plates on pile foundation, different types of piles, precast and cast in situ with reinforcement details for different types of grids, details of pile capping, jointing of precast piles and columns.

UNIT-IV MISCELLANEOUS STRUCTURES**10**

Plates on shell structures, domes, space frame, PEB structures, shell barred vault, folded plate structures, tensile structures, pneumatic structures, etc

TOTAL: 60 PERIODS**TEXT BOOKS:**

1. 1.Lifts, Elevators, Escalators and Moving Walkways/Travelators M.Y.H. Bangash ,T. Bangash
2. 2.Vertical Transportation: Elevators and Escalators 2nd Edition by George R. Strakosch (Author)
3. Pile Foundations in Engineering Practice, Shamsheer Prakash, Hari D. Sharma
4. 4.Theory and Practice of Pile Foundations,Wei Dong Guo

REFERENCE BOOKS:

1. 1.Practical handbook on building construction; Nabhi Publication,M.K.Gupta.
2. 2.Fundamentals of Building Construction: Materials & Methods,Edward Allen,Joseph Iano,Wiley
3. Analysis, Design and Construction of Steel Space Frames, G. S. Ramaswamy, Mick Eekhout
4. Introduction to Shell Structures ,Melaragno, Michele G

BAR17L14

**ARCHITECTURAL DESIGN - V
(2 DESIGN CONCEPT 105 PERIODS EACH)**

**L T S C
0 0 14 7**

AIM:

To explore the design of buildings addressing the socio - cultural & economic needs of contemporary urban society.

OBJECTIVES:

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, taking into account aspects such as user perception, crowd behaviour, large scale movement of people and identity of buildings.

To emphasize 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 computer aided presentation techniques involving 2D and 3D drawings and models as required.

UNIT-I DESIGN STUDIO

Small complexes - multi planning circulation analysis - massing problems involving building technology - Design and detailing for movement of physically handicapped and elderly persons within and around buildings, examples, shopping centre (Commercial) apartments (Residential) Nursing home (Institutional) home for aged. Introduction to three dimensional modeling of spaces using computer, Construction and manipulation of three dimensional building data bases, Rendering 3D images, Presentation techniques.

TOTAL : 210 PERIODS

REFERENCES:

1. Edward D. Mills, "Planning, 4 volumes", Newnes, Butterworths, London, 1976.
2. E and O.E. "Planning". Liffie Books Ltd., London, 1973.
3. "National Building Code" 1ST
4. De Chiara Callender, "Time Saver Standard for Building Types", McGraw Hills Co., 1973.

UNIT-I INTRODUCTION**10**

Elements of Human Settlements - Role of Man and Society in the growth and decay of human settlements.

UNIT-II PLANNING CONCEPTS**10**

Contribution to planning thought - Patric Geddes, Ebener Howard – CA Perry - Le Corbusier Doxiadis - Mumford - Relevance to Indian Planning Practice – Challenge of Urbanization.

UNIT-III URBAN PLANNING**10**

Various types of plans, Master plan, structure plan, comprehensive plan, subject plan, Zonal Development plan, their scope and content, planning process.

UNIT-IV URBAN DEVELOPMENT PROGRAMMES**8**

IUDP, IDSMT, Megacity, FIRE, Sustainable City Programme - their context, concept, scope, content and funding mechanism, JNNURM, AMRUT, Smart Cities.

UNIT-V RURAL PLANNING**7**

Rural settlement structure - Demographic dynamics - micro level planning: Scope and content.

TOTAL: 45 PERIODS**REFERENCES:**

1. C.L.Doxiadis, Ekistics, 'An Introduction to the Science of Human Settlements', Hutchinson, London, 1968.
2. Urban design, the Architecture of Towns and Cities - Paul D Spreiregen.
3. Chennai Metropolitan Development Authority, Second Master Plan
4. Government of India, 'Report of the National Commission on Urbanisation', 1988.
5. Ministry of Urban Affairs and Employment, Government of India, New Delhi, 'Urban Development Plans: Formulation & Implementation' - Guidelines - 1996.
6. Hansen N., 'Regional Policy and Regional Integration' Edward Elgar, UK, 1996.
7. Centre for Human Settlements, Anna University, Chennai 'Development Plan for Uthokottai Taluk, Cheyyur Taluk', 1999.
8. Andro D.Thomas, 'Housing and Urban Renewal, George Allen and Unwin, Sydney, 1986.
9. JNNURM Template.

UNIT-I CRITIQUING MODERNISM 8

Challenging CIAM declarations: Team X and Brutalism - Writings of Venturi - Jane Jacobus - Aldo Rossi - Christopher Alexander.

UNIT-II AFTER MODERNISM 10

Conditions of Post-Modernity - Tools of New Architecture: Collage, Technology and New Science - Canonization of Post-Modernist Architecture - Historic Revivalism - Pop Architecture - Critical Regionalism - Deconstructivist Theory and Practice.

UNIT-III ALTERNATIVE PRACTICE 4

Ideas and Works of Fathy - Baker - Ando - Soleri - Bawa.

UNIT-IV POST-INDEPENDENT ARCHITECTURE IN INDIA 8

Chandigarh and Bhuvaneshwar experiments - Influence of Corbusier, Louis Khan Koeinsberger - The formation of Institutions - Debates on Tradition as a source and burden - works and ideas: Nari Gandhi - Doshi - Kanvinde - Correa - Raje - Jain - Stein Housing and the issues of Appropriate Technology-Architecture in the Horizon.

TOTAL: 30 PERIODS**REFERENCES:**

1. Aldo Rossi, The Architecture of the City, MIT Press, Massachusetts, 1982.
2. Charles Jencks, The Language of Post-Modern Architecture, 1984.
3. Christopher Alexander, Pattern Language, Oxford University Press, Oxford.
4. D.Ghirardo, Architecture After Modernism, Thames and Hudson, London, 1990.
5. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London, 1994.
6. Miki Desai et.al, Architecture and Independence, Oxford University Press, New Delhi, 1998.
7. Robert Venturi, Complexity and Contradiction in Architecture, The Architectural Press, London, 1977.

UNIT-I DAMP AND WATER PROOFING

7

Damp proofing -hot applied and cold applied - Emulsified asphalt, Bentonite clays, butyl rubber, silicones, vinyls, Epoxy resins and metallic water proofing materials - properties, uses, (Waterproofing membranes such as rag, asbestos, glass, felt plastic and synthetic rubber - Vinyls, butyl rubber, neoprene polyvinyl chloride (PVC) - prefabricate membranes - sheet lead, asphalt - properties and uses. Application of the above under various situations - basement floors, swimming pool, terraces etc.

UNIT-II THERMAL INSULATION

7

Heat transfer and heat gain by materials - vapour barriers and rigid insulation. Blanket, poured and reflective insulation - properties and uses of spun glass, foamed glass, cork, vegetable fibres, mineral fibres, foamed plastics, vermiculite and glass fibres. Gypsum - manufacture, properties and uses, plaster of Paris and anhydride gypsum. Construction details of the materials application of floor, walls and roofs. Detailing for physically handicapped.

UNIT-III ACOUSTIC INSULATION

4

Porous, Baffle and perforated materials such as acoustic plastic, acoustic files, wood, partial board, fibre board, cork, quilt and mats - Brief study on properties and uses of above - current developments.

UNIT-IV FLOOR AND WALL COVERING

6

Floor coverings -flooring - softwood, hardwood - Resilient flooring - Linoleum, Asphalt tile, vinyl, rubber, cork files - terrazzo - properties, uses and laying. Wall coverings - Porcelain, enameled metal, wood veneer, Vinyl, plastic surfaced panelling - properties, uses and laying. Wall and floor tiles - Ceramic glazed, mosaic, quarry and cement tiles - properties, uses and laying. Detailing for physically handicapped.

UNIT-V PROTECTIVE AND DECORATIVE COATING

6

Paints - Enamels, distempers, plastic emulsions, cement based paints - properties, uses and applications - Painting on different surfaces - defects in painting. Clear coatings and strains - Varnishes, Lacquer, Shellac, Wax Polish and Strains - Properties, uses and applications. Special purpose paints - Bituminous, Luminous, fire retardant and resisting paints - properties, uses and applications.

TOTAL: 30 PERIODS**TEXT BOOKS:**

1. S.C. Rangwala, "Building Construction (Sixteenth Edition)" Charotar Publishing House, Anand, India, 1997.

REFERENCES:

1. Arthur R. Lions, "Materials for architects and builders - An introduction", Holder Heading group, Great Britain, 1997.
2. Jack M. Launders, "Construction Materials, Methods", careers pub, J. Holland, Illinois Wileox Co., Inc. 1983.
3. W.B. Mckay. "Buildig construction", Longman, U.K. 1921._
4. Don. A watson, "Construction Material and processes", McGraw Hill Book Co., 1972.

UNIT-I HISTORY OF INTERIOR DESIGN**8**

Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc. Definition of interior design - interior design process - vocabulary of design in terms of principles and elements - Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - study and design.

UNIT-II PRINCIPLES OF INTERIOR DESIGN**8**

Introduction to various Principles in Interiors like Unity, Balance, Rhythm, Emphasis, Harmony, Scale and Proportion, Contrast, Exercises involving the same.

UNIT-III CHARACTERISTICS OF INTERIOR DESIGN**12**

Introduction to various elements in interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc. and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects - design projects.

UNIT-IV ELEMENTS OF INTERIOR DESIGN - LIGHTING, COLOR, TEXTURE ACCESSORIES, INTERIOR LANDSCAPING**12**

Study of interior lighting - different types of lighting, their effects, types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors - paintings, objects de art, etc.

Interior landscaping - elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

UNIT-V ERGONOMICS - FURNITURE DESIGN**20**

Study of relationship of furniture to spaces and human movements furniture design as related to human comfort, function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. - projects on furniture design.

TOTAL : 60 PERIODS**REFERENCES:**

1. Francis D.K.Ching, Interior Design Illustrated, V.N.R. Pub. NY 1987.
2. An Invitation to design, Helen Marie Evans.
3. Steport - De - Van Kness, Logan and Szebely, Introduction to Interior Design Macmillan Publishing Co., NY 1980.
4. Julius Pendero and Martin Zelnik, Human Dimensions and Interior space Whitney Library of Design, NY 1979.
5. Inca/Interior Design Register, Inca Publications, Chennai 1989.
6. Kathryn B.Hiesinger and George H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press, 1993.
7. Syanne Slesin and Stafford Ceiff - Indian Style, Clarkson N.Potter, Newyork, 1990.
8. The Impulse to adorn - Studies in traditional Indian Architecture. - Editor Dr.Saranya Doshi, Marg Publications, 1982.

WEBSITES<http://iiid.org/><http://www.arch.ufl.edu/interior/indwebsts.htm><http://www.interiormall.com><http://www.scandinaviandesign.com/><http://www.tifaq.com/furniture.html><http://www.fxdesign.co.UK/>

UNIT-I DAMP AND WATER PROOFING 16

Plates on water proofing of basement floors, swimming pools, terraces etc. and materials specification on drawings.

UNIT-II THERMAL INSULATION 16

Plates on details of heat and cold insulation of floor, walls and roofs, using different insulation materials in cold storages.

UNIT-III ACOUSTIC INSULATION 16

Plates on acoustic insulation of floor, walls and roofs, using different insulation materials in seminar hall and theatres.

UNIT-IV FLOOR AND WALL COVERING 12

Plates on different application of materials used in different function of areas for floor & Wall coverings.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Practical handbook on building construction; Nabhi Publication, M.K.Gupta.
2. Fundamentals of Building Construction: Materials & Methods, Edward Allen, Joseph Iano, Wiley
3. Barry, Introduction to Construction of Buildings, Blackwell Publishing Ltd., Oxford, 2005

REFERENCE BOOKS:

1. Dr. B.C.Punmia, A Text book of Building Construction, Laxmi Publications Pvt. Ltd., New Delhi, 2001.
2. T.D Ahuja and G.S. Birdie, Fundamentals of Building Construction, Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
3. Francies D.K.Ching – Building Construction illustrated. VNR, 1975

BAR17L16

**ARCHITECTURAL DESIGN - VI
(2 DESIGN CONCEPT 105 PERIODS EACH)**

**LT S C
0 0 15 7**

AIM:

To explore 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.

OBJECTIVES:

To create an awareness with regard to the design of green buildings and sustainable architecture.

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 highlight on the importance of High rise buildings as elements of identity in urban areas and urban design principles that govern their design.

To enable Students to understand the importance of designing the built environment to suit the human behavior.

To explore computer aided presentation techniques involving 2D and 3D drawings, walk through and models as required.

UNIT-I DESIGN STUDIO

Design of large structures - Multiuse multi span - non masonry building types involving buildings – Design and detailing for movement and use by physically handicapped people within and around-building technology and services. Examples: college (Institutional) office buildings Resorts - etc.

Working drawings for any one design using computers.

TOTAL: 225 PERIODS

REFERENCES:

1. Edward D mills, planning, 4 volumes, Newnes Butterworths, London 1976
2. E and OE planning 11ffe Books Ltd., London, 1973
3. National Building Code 151
4. De Chara and Callendar, Tune, saver standards for building types. McGraw Hall Col. 1983.

WEBSITES

<http://wwwtest.library.ucla.edu/libraries/arts/websites/wwwdes.htm>

<http://www.clr.toronto.edu/VIRTUALLIB/ARCH/proj.html>

<http://www.thehub.net.au/%7Emorrisqc/architext>

<http://www.archinet.co.uk/>

<http://archinform.de/start.en.htm>

<http://www.plannet.com/>

SEMESTER - VII

BAR17025

COST ESTIMATING AND SCHEDULING

L T S C

3 0 0 3

UNIT-I INTRODUCTION TO ESTIMATION

10

Types and purpose, approximate estimate, detail estimate of building, Bill of quantity format.

Quantity survey - Principle of measurement and billing, elementary billing and measurement of basic materials like brick, wood, concrete, etc. Advance billing and measurement of structural and service item of work.

UNIT-II COST ESTIMATING

10

Function of cost planner, liason with consultant construction planning technique for efficient cost control or cost budgeting of a project.

Exercise in variation, cost adjustment and cost analysis norms and standard for building project. Relationship between specification with B.O.Q. on grounds of cost economics.

UNIT-III COST BUDGETTING

10

The business environment, and its structure in practice details and information on taxation, depreciation, operational cost, economics of building plant and material handling.

UNIT-IV FINANCE AND BUDGETTING

9

Financial control and management for building construction and maintenance investment - role of various financial agencies for building and land development.

UNIT-V PROJECT EVALUATION

6

Financing of projects, economic feasibility report, valuation depreciation and its implication, and assessment of completed project.

TOTAL : 45 PERIODS

REFERENCES:

1. Dutta, Estimating and Costing, S.Dutta and Co., Lucknow
2. S.C.Rangwala, Elements of Estimating and Costing, Charoter Publishing House, India.
3. W.H.King and D.M.R.Esson, Specification and Quantities for Civil Engineers, The English University Press Ltd.
4. T.N.Building Practice, Vol.1, Civil, Govt. Publication.
5. P.W.D. Standard specifications, Govt. Publication.

WEBSITES

<http://www.archindia-com>
<http://www.abuildnet.com>
<http://www.buildernews.com/>
<http://www.builderdata.com/>
<http://www.building.ca/>

UNIT-I INTRODUCTION**9**

Definition and Terminologies – Elements of Urban design - Historic Urban Form - Western: Morphology of early cities – Greek Agora – Roman Forum – Medieval towns – Renaissance place making – Ideal cities – Industrialization and city growth - Tony Garnier Industrial city – American grid Planning.

UNIT-II URBAN DESIGN IN INDIAN CONTEXT**9**

Historic Urban Form – Indian – Evolution of Urbanism in India- Temple towns- Mughal city form- Medieval City- Colonial Urbanism – Urban Spaces in Modern city- Chandigarh, Bhuvaneshwar and Gandhi Nagar

UNIT-III THEORIES & CONCEPTS OF URBAN DESIGNERS**9**

Theorizing and reading urban space: Urban concepts pioneers in Urban Design : Gordon Cullen, Kevin Lynch- Aldo Rossi –Christopher Wren – William White – Jane Jacob – Rem Koolhaas – Le Corbusier – Edmund Bacon – Charles Correa – B.V.Doshi

UNIT-IV URBAN LANDSCAPE**9**

Introduction to landscape Architecture - Hard and soft landscape elements; Plant materials – classification, characteristics, use and application in landscape design.
Landscape Ecology, Ecological balance, Water and Landform. Landscape conservation, reclamation and landscaping of derelict lands.

UNIT-V OPEN SPACE SYSTEM AND ELEMENTS IN URBAN LANDSCAPE**9**

Open space development in urban design context. Evolution of public park as a major component of urban landscape. Open space development in new towns - Park systems, waterfronts - Green infrastructure - Urban ecology, urban water sheds.
Design of public parks, roads, green ways, parkways, promenade and plaza. Public art - Plant selection criteria, furnishings and lighting of public space - Maintenance and management of public spaces and parks

TOTAL: 45 PERIODS**REQUIRED READING:**

1. Gordon Cullen – The concise TOWNSCAPE – The Architectural Press – 1978.
2. Gosling and Maitland – URBAN DESIGN - St.Martin's Press, 1984
3. Michael Laurie, An Introduction to Landscape Architecture, Elsevier, 1986.
4. Geoffrey and Susan Jellicoe, The Landscape of Man, Thames and Hudson, 1987.
5. The Urban Pattern, Simon Eisner, Arthur Gallion, Stanley Eisner

REFERENCES:

1. T S S for Urban Design, Mc Graw Hill, Inc, 2003
2. Urban design, the Architecture of Towns and Cities - Paul D Spreiregen.
3. Concept of Space in Traditional Indian Architecture-Yatin Pandya
4. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995.
5. Design with nature, Ian McHarg
6. Earthscape: A Manual of Environmental Planning and Design, John O. Simonds
7. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993.
8. Handbook of Urban Landscape, Cliff Tandy, Architectural press, 1973.

AIM:

To explore the continuity and dynamics of urban form with a thrust on the interrelationships between the disciplines of architecture, urban design and town planning

OBJECTIVES:

To understand the various components and aspects of the urban environment as well as their interrelationships

To understand in specific components/issues such as public spaces, physical infrastructure, socio-cultural aspects- heritage, gender, class, dynamics of urban growth

To understand people as users of the urban environment in various scales.

To explore techniques of mapping and diagramming to understand the dynamic urban environment.

To take design decisions in a comprehensive manner understanding their implications in the larger context.

CONTENT:

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

Areas of focus/ issues:

- exploration of relationship between building and larger context
- contemporary processes in design
- appropriate architecture
- addressing issues in urban areas - transportation, sustainability, heritage, sprawl, place making, identity, collective memory
- Mixed use programming

Suggestive Typology/ project: those involving large scale urban interventions as well as large scale projects which have 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, multi-use urban complexes.

TOTAL: 240 PERIODS

REQUIRED READING:

1. Jonathan Barnett, An Introduction to Urban Design
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. I.Jawgeih, Life between Buildings,- Using Public Space, Arkitektens Forleg 1987
4. Time Savers Standard for Urban Design
5. Urban design Futures

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

SEMESTER - VIII

BAR17L18

PRACTICAL TRAINING

0012**

AIM:

To expose students to gain knowledge on Professional practice through one semester intensive internship program in an established Architectural Firm.

OBJECTIVE:

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.

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

- Adherence to time schedule, Discipline.
- Ability to carry out the instructions on preparation of schematic drawings, presentation drawings, working drawings.
- Ability to work as part of a team in an office.
- Ability to participate in client meetings and discussions.
- Involvement in supervision at project site.

At the end of the Internship program a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

SEMESTER - IX

BAR17027

PROFESSIONAL PRACTICE

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UNIT-I ARCHITECT AND PROFESSION;SERVICES AND SCALE OF FEES 9

Role of architect in society - relationship with client and contractor - code of conduct – Conditions of engagement of an architect - normal additional, special and partial services – scale of fees for various services - claiming of fees

UNIT-II ARCHITECTURAL COMPETITIONS 6

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

UNIT-III BUILDING LEGISLATION AND EASEMENTS 12

Salient features of various Acts such as Architects' Act 1972 -Chennai Corporation Building Rules 1972-The Panchayat Building Rules 1942-The Tamil Nadu Factory Rules 1950-Development control Rules for Chennai Metropolitan Area 1990 -Definition - types of easement – acquisition extinction and protection of easements

UNIT-IV TENDER & CONTRACT 12

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

UNIT-V ARBITRATION 6

TYPES OF ADR -Arbitration in disputes - arbitration agreement - sole arbitration - umpire - excepted matters - award

TOTAL: 45 PERIODS

REFERENCES:

1. J.J. Scott, Architect's Practice, Butterworth, London 1985
2. Publications of COA IIA Hand book on Professional Practice,The Architects publishing Corporation of India, Bombay 1987
3. D.C. Rules for Chennai Metropolitan Area 1990
4. T.N.D.M. Building Rules, 1972
5. T.N.P. Building Rules 1942
6. Chennai City Corporation Building Rules 1972
7. Derek Sharp, The Business of Architectural Practice William Collins Sons & Co. Ltd, 8 Erafton St., London W1 19868.Roshan Namavathi, Professional Practice, Lakshmi Book Depot, Mumbai 1984 Publication of IIA
8. Environmental Laws of India - by Kishore Vanguri, C.P.R. Environmental Education Centre, Chennai
9. The Tamil Nadu Hill Areas Special Building Rules - 19
10. Heritage Act
11. Consumer Protection Act
12. Indian Easements Act
13. Professional Practice –Prof.Radhey Mohan Chundur.

COURSE OVERVIEW:

The course provides students with a framework to understand some emerging concepts in Architecture, Projects of Design complexity and equip the student with adequate architectural design research methods for the realization of thesis concept. During the course of study, the subject of the thesis is developed and the project is articulated.

OBJECTIVES:

To impart knowledge to students, on the tools and methods needed to handle a design project of reasonable complexity individually.

COURSE OUTCOME:

The skills required to collect, assimilate and synthesis data relevant to handle a design thesis project independently.

PART-I INTRODUCTION TO ARCHITECTURAL THESIS 30

Emerging concepts in Architecture due to changes in social, economic, technological variables - Review of projects of design complexity, involving themes, sub themes and architectural expression - Introduction to Architectural Thesis Project - Understanding the scale of Thesis Project- Methodology of Thesis - Selection of Topics - Writing of Synopsis-Finalization of Thesis topic.

PART-II PROJECT BRIEF 30

Literature Review ,Standards, Data analysis - Case studies(web, book and live) - Comparative Analysis - Inferences

PART-III REPORT WRITING 30

Techniques in report writing - Presentation of contextual information relevant to interpretation of the data collected - Analysis of Site, Case studies and Inferences - Framing of Project Requirements - Report Submission of Part I & Part II

TOTAL: 90 PERIODS**REFERENCES:**

1. Mukhi, H.R. Technical Report Writing: Specially prepared for Technical and Competitive Examinations, New Delhi: Satya Prakashan, 2000.
2. Barrass, Robert. Writing At Work a guide to better writing in administration, business and management, London:
3. Routledge, 2003. Seely, John. The Oxford guide to effective writing and speaking, 2nd ed., Oxford;
4. New York : Oxford University Press, 2005. Jo Ray McCuen, Anthony Winkler. Readings for writers, 9th ed., Fort Worth :
5. Harcourt Brace College Publishers, 1998. Treece, Malra. Effective reports, 2nd ed., Boston: Allyn and Bacon, 1985.
6. Visual Research Methods in Design, Henry Sanoff

AIM:

This Design studio attempts to foster an understanding of large scale Projects incorporating innovation & experimentation with regard to form / structure.

OBJECTIVES:

To introduce the design of multifunctional multi-storeyed buildings/complex layouts.

To enable Students to understand the importance of designing the built environment to suit the human behavior.

Projects shall have enough emphasis on technology and the application of various building services and circulation systems.

To understand the structure of dwelling community and neighbourhood.

To understand the design requirements with respect to services [HVAC, STP, WTP], fire and safety aspects etc.

To study vertical transportation requirements and design considerations for high rise buildings

COURSE OUTCOME:

The students shall have acquired knowledge of designing multifunctional, multi-storeyed buildings based on project brief, site and cultural context of the design problem. They shall be able to analyse the function, building services and circulation systems in public buildings and develop suitable designs. It helps the students to conceive larger projects with emphasis on market standards and requirements. This should also introduce the students to fire and safety aspects, earthquake resistant design methods. In all the design assignments due cognizance must be given to accessibility to differently abled users.

Design Project :

Gated community/Integrated Township/Group housing/Traditional settlement/ Hill area housing/
Transport Interchanges/ Transport Terminals/ Sports Stadium.

TOTAL: 300 PERIODS**REFERENCE BOOKS:**

1. Time saver standards for building types, DeChiara and Callender, Mc Graw hill company
2. Neufert Architect's data, Bousmaha Baiche & Nicholas Walliman, Blackwell science ltd
3. National Building Code – ISI
4. New Metric Handbook – Patricia Tutt and David Adler – The Architectural Press
5. Mills E. D., Planning: Architect's Handbook, 10/e, Butterworths, 1985.
6. Ramsey C. G., H. R. Sleeper, Architectural Graphic Standards, 11/e, Wiley, 2008

SEMESTER - X

BAR17L21

THESIS

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OBJECTIVES:

All the five years of Architectural Design culminate in the Thesis Project to motivate student to involve in individual research and methodology. This is to train the students in handling projects independently.

TOPICS OF STUDY

The main areas of study and research shall be Architecture, Urban design, Urban renewal and rural settlements, Environmental Design, Conservation, Landscape Design, House etc... However, the specific thrust should be architectural design of built environment.

METHOD OF SUBMISSION

The Thesis Project shall be submitted in the form of drawings, project report, models, slides etc.

REQUIRED READING:

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
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
3. Richard Kintermann and Robert small site planning for cluster Housing van nastrand reinhold company, Jondon/New York 1977.
4. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
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
8. Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001.

ELECTIVES

BAR17E01	ENERGY EFFICIENT ARCHITECTURE	L T S C 2 0 0 2
UNIT-I	CLIMATE AND SHELTER	5
Historic buildings – preindustrial, postindustrial and modern architecture - examples from different climatic zones.		
UNIT-II	SOLAR ENERGY AND BUILDINGS	5
Solar geometry and shading - Thermal comfort - Heat Transfer - Heating and cooling loads -Energy estimates - Conservation – Day lighting - Water Heating and Photo voltaic system.		
UNIT-III	PASSIVE SOLAR HEATING	5
General principles - Direct gain - Thermal storage wall - sunspace - convective air loop -examples		
UNIT-IV	PASSIVE COOLING	5
General principles - Ventilation - Radiation - Evaporation and Dehumidification – Mass effect - examples.		
UNIT-V	SITE PLANNING AND DEVELOPMENT	5
Land form - vegetation type and pattern - water bodies open spaces and built spaces – urban landscape -design strategies.		
UNIT-VI	ECOLOGY, EMBODIED ENERGY AND LIFE CYCLE ENERGY REQUIREMENT IN BUILT FORM	5
Analysis and understanding of ecological balance and impact of energy uses on ecology. Understanding of embodied energy and life cycle energy requirement, m different categories of built form. Green Architecture and its impact Non Conventional Energy Sources, its uses and impact on Ecology.		

TOTAL: 30 PERIODS

REFERENCES:

1. Fuller Moore, Environmental Control Systems, McGrawHill, Inc., New Delhi, 1993.
2. A.Konya, Design Primer for Hot Climates, Architectural Press, London, 1980.
3. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi - 1995.
4. Ms.Sufiha, N.K.Bansal and M.A.S.Malik - Solar Passive Building - Pergamon Press.
5. V.Gupta - Energy and Habitat - Wiley Eastern Limited, New Delhi.
6. Report on Energy Efficient Architecture by - TERI
7. T. Green Building Handbook by Tom Wooly Sam Kimmins, Paul Harrison and Rob Harrison.
8. Solar Energy Utilization - G. D. Rai
9. Non Conventional Energy Sources

WEBSITES

www.terin.org/
<http://solstice.org/efficiency/index.shtml>
<http://www.erivinst.conu.edu/~envinst/research/built.html>

UNIT-I INTRODUCTION 4

Approaches and concepts to the study of Vernacular Architecture - Aesthetic -Anthropological - Architectural - Developmental - Geographical - Historical - Spatial -Folkloristic.

UNIT-II TRADITION AL-PRINCIPLES OF PLANNING IN WESTERN & NORTHERN INDIA 8

Primitive forms, symbolism, colour, Folk Art, etc. in the Architecture of the Deserts of Kutch and Gujarat State—Subterranean Architecture — Wooden Houses & Mansions (Havelis) Gujarat & Rajasthan — Houseboats (Dhungas), Kashmir - Materials of Construction & Construction detail.

UNIT-III VERNACULAR ARCHITECTURE OF SOUTH INDIA 6

Wooden Houses, palaces & Theatres in Kerala, Chettinad houses and palaces in Tamil Nadu — Principles of Planning, proportion & religious practices & beliefs & culture, materials of construction & construction detail & settlement planning.

UNIT-IV WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE 6

Colonial influences on the Traditional House, Goa, and change — Bangla & Bungalow, Bengal and Victorian Villas — Planning Principles, materials & methods of construction — House Typologies, settlement Planning, Pondicherry & Cochin.

UNIT-V SECULAR ARCHITECTURE 6

Medieval period - Citadels, palaces, towers, gateways, public buildings, etc. in the medieval towns of Jodhpur, Jaipur, Jaisalmer, Gwalior, etc.

TOTAL: 30 PERIODS**REFERENCES:**

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

UNIT-I	DESIGN	6
Definition of design, understanding of design, purpose of design, nature of good design and evaluation of design, types of design classifications, role of designer, design in history.		
UNIT-II	DESIGN PROCESS	6
Context for architectural design problems, design process, stages in the design process from different considerations, different ideas of design methodology.		
UNIT-III	DESIGN PROBLEMS AND SOLUTIONS	6
Different approaches to design, problem solving or intuitive, formulation of problems, nature of creative design problems, goals in design.		
UNIT-IV	DESIGN THINKING	6
Understanding the terms creativity, imagination, etc. Theories on thinking, convergent and divergent thinking, lateral and vertical thinking, creative techniques like checklists, brainstorming, synthetics, etc. design puzzles and traps, blocks in creative thinking.		
UNIT-V	DESIGN CONCEPTS, PHILOSOPHIES AND STRATEGIES	6
Various approaches to generate ideas for architectural design types of concepts, personal philosophies and strategies of individual designers, channels to creativity in architecture.		
		TOTAL :30 PERIODS

REFERENCES:

1. Geoffrey Broadbent - Design in Architecture - Architecture and the human science - John Wiley & Sons, New York, 1981.
2. Bryan Lauson - How Designers Think, Architectural Press Ltd., London, 1980.
3. Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984.
4. Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984.
5. James C.Snyder, Anthony J.Catarex - Introduction to Architecture, McGraw Hill Inc., 1979.
6. Allen Mave Evans & Caula David Dumes Nil, An Invitation to Design; Macmillan Publishing Co., New York, 1982
7. Edward De Bone, Lateral Thinking
8. Christopher Alexander, Pattern Language, Oxford University Press.

UNIT-I INTRODUCTION**4**

Wastes in built Environment - Traditional practices of waste management - Current scenario in India - Categorization of solid, liquid and gaseous waste - Sectors responsible for waste generation.

UNIT-II WASTE IN BUILT ENVIRONMENT**6**

Solid and liquid waste from Residential and Commercial building - Environmental significance - Segregation and treatment of waste - Industrial case studies - Experiments in Construction industry - Demolition waste - NGO's in waste management.

UNIT-III ENVIRONMENTAL MANAGEMENT AND ENERGY OPTIONS**6**

Degradation of Environment due to waste - Salient features and Environmental laws - Rainwater harvesting techniques - Biological and thermal energy options - Refuse derived fuel and other options.

UNIT-IV RECYCLING OF WASTES**6**

Meaning of sustainable approach - Identification and workability of waste - Concept of recycling solid and liquid waste in Building industry - Solid waste recycling, vermi-composting, Biogas production - Liquid waste recycling methods and practices.

UNIT-V ALTERNATIVE BUILDING MATERIALS**8**

Need for recycling Industrial by products as alternative building material - Use of Fly ash, Furnace slag, Quarry dust. Silica fume, Waste lime and Gypsum - Technology required for manufacturing - Specification and application in Construction industry.

TOTAL: 30 PERIODS**TEXT BOOKS:**

1. Arcewah S.J. Waste water treatment for pollution control.
2. REFERENCES:
3. Ranindra Raja R.S., Tam. T.C. Properties of concrete made with crushed concrete a coarse aggregate - Magazine of concrete research.
4. E. R. M. UK, Municipal solid waste management, Study for MM A
5. R. Ambalavanan and A. Roja, Feasibility studies on utilisation of waste lime, Gypsum with fly ash.

AIM:

To study the concepts of interior landscaping and their application in the design of interior spaces.

OBJECTIVES:

To develop an understanding about the design of interior landscape with special emphasis on the choice and of plant materials used in the interior spaces.

To study about the various landscaping elements and their application in interior spaces.

UNIT-I INTERIOR LANDSCAPING 4

Definition, classification of plants, indoor plants and their functions, layout & components, floriculture – commercial, ornamental, selection of plants & pest control.

UNIT-II PHYSICAL REQUIREMENTS OF PLANTS 6

Physical requirements of plants – light, temperature, water planting medium, soil separator, weight of plants, acclimatization & maintenance.

Techniques to meet physical requirements.

UNIT-III INTERIOR LANDSCAPING ELEMENTS & PRINCIPLES 8

Various interior landscaping elements – water bodies – pools, fountains, cascades.

Plants, rocks, artifacts, paving & lighting, design guidelines – plant texture & colour, plant height, plant spacing.

UNIT-IV ROOF AND DECK LANDSCAPE 6

Protection of the integrity of the roof and structure, provisions for drainage, light weight planting medium, irrigation, selection of materials, water proofing, provision for utilities and maintenance.

UNIT-V EXERCISE ON INTERIOR LANDSCAPE 6

Courtyard design

An outdoor room design

Terrace garden

TOTAL: 30 PERIODS

REFERENCES:

1. Time saver standards for landscape architecture.
2. Planting design by Theodore D.Walker, VNR Publications New York.
3. Landscaping Principles and Practices by Jack E.Ingels, Delmar Publishers

UNIT-I INTRODUCTION**6**

Traditional definition - Feng shui in Architecture - achievements in India - Meaning of Vastu and Vaastu - its classification - Relationship to earth.

UNIT-II SPACE THEORY IN VASTU**6**

Features of good building site - good building shapes - macro, micro, enclosed and material spaces - relationship between built space, living organism and universe - impact of built space on human psyche.

Flow of energy within built space and outside - zoning of functional areas - fitting of components in the building - significance of water bodies and energy - The cube as the basic structure.

UNIT-III COSMOGRAM & SETTLEMENT CONCEPTS**6**

Orientation of building, site, layout and settlement - positive and negative energies -importance of cardinal and ordinal directions - The celestial grid or-mandala and its type.

The Vaastu Purusha Mandala and its significance in creation of patterns, and lay-outs, extension of this to aural and visual fields - Types of Jay-Outs.

UNIT-IV PRINCIPLE OF ARCHITECTURE IN FENG SHUI**6**

introduction to feng shui- chi (energy)- yin and yang - eight yin-yang energies - bagua map - five elements- element colours and shapes - bagua sectors

UNIT-V EXERCISES**6**

Exercises involving use of various elements in design of exterior and interior spaces, courtyards etc. of different functional buildings adopting vastu and feng shui principles.

TOTAL: 30 PERIODS**REFERENCES:**

1. Dr.Prasanna Kumar Acharya - Manasara - Ox ford1 University Press - 1927 -(English version) -
2. K.S.Subramanya Sastri - Maya Matam - Thanjavur Maharaja Sarjoji saraswathil Mahal Library - Thanjavur-1966.
3. Stella Kramresh - The Hindu Temple Vol.1 & II Motital Banarsidass Publishers Pvt. Ltd., Delhi - 1994.
4. Bruno Dagens - Mayamatam, Vol.1 & IIIGNCA and Motilal Bamarsidars, .Publishers Pvt. Ltd-s Delhi -1994.
5. George Birdsall - Feng Shui: The Key Concepts - January 2011
6. Stapatya Veda, Ganapathi Sthapati.
7. Introduction to Vastu-Sasikala Anand
8. Essay on Hindu Architecture-Ramraz.

AIM:

Learning of building construction will not realize its full objectives unless it is supplemented by a thorough understanding of the methods for achieving sound detailing. It is necessary for the students to understand the principles of detailing as applicable to various structural and non-structural situations in Indian context.

OBJECTIVES:

To enable students to appreciate the challenges in detailing for both the newly designed buildings as well as while carrying out additions and alterations to existing buildings.

To enable students to understand the various Fittings, Furniture & Equipment (FFE) that are needed in buildings and their installation methods.

To train students towards adopting an integrated approach while dealing with complex buildings incorporating various allied requirements.

**UNIT-I INTRODUCTION TO CURRENT DEVELOPMENTS
IN BUILDING INDUSTRY**

10

Smart Materials: Characteristics, classification, properties, energy behaviour, intelligent Environments.

Recycled and ecological materials and energy saving materials: Straw-bale, card board; earth-sheltered structures, recycled plastics, recycled tyres, paper-crete, sandbags, photovoltaic, solar collectors, light-pipes, wind catchers.

Exercises of the above through case studies and drawings.

**UNIT-II DETAILING OF WALLS, ROOFS AND FLOORING FOR
INSTITUTIONAL BUILDINGS**

20

- a) Detailing of a residence - selected spaces.
- b) Detailing of classrooms, library (in school, college)
- c) Detailing of lecture hall, auditorium, exhibition spaces

Exercises of the above through case studies and drawings.

**UNIT-III DETAILING OF WALLS, ROOF, FLOORING FOR
COMMERCIAL BUILDINGS**

20

- a) Detailing of shop-fronts, office spaces for commercial buildings including detailing of crucial elements such as entrance porches, main doors, staircases, show-windows, enclosed and air-conditioned atrium spaces.
- b) Detailing of facade and selected spaces for apartment buildings, hotels and hostels.

Exercises of the above through case studies and drawings.

UNIT-IV DETAILING OF BUILT-IN FURNITURE AND FITTINGS

10

Detailing of built-in elements like kitchen counters, cupboards, cabinets, toilets, toilet fitting.

Exercises of the above through case studies and drawings.

**UNIT-V DETAILING OF EXTERIOR AND INTERIOR
ARCHITECTURAL ELEMENTS**

15

Detailing of architectural elements like indoor fountains, water walls, transparent floors, street furniture, hard and soft landscape, swimming pools, water bodies and courtyard spaces.

Detailing of interior architectural elements in existing buildings (e.g. Staircase in bookshops, restaurants, playpen in restaurants, reception areas in hotel lobbies etc.)

Exercises of the above through case studies and drawings.

TOTAL: 75 PERIODS

REQUIRED READING:

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), 2004
2. Swimming Pools, Lane Book Company, Menlo Park, California
3. Nelson L Burbank, House Carpentry Simplified, Simmons-Board- Man
4. Publishing Corporation, New York,
5. Landscape Construction
6. Grant W. Reid , Landscape Graphics, Whitney Library of Design, 1987

PURPOSE:

To familiarize the students with digital concepts.

INSTRUCTIONAL OBJECTIVES:

To make the students use of latest digital modes.

UNIT-I	SKETCHING	10
Outdoor sketching including Lawns, bushes, water bodies, plants & trees in different media, indoor sketching - furnitures, lights, corridor, lobby, class room etc.		
UNIT-II	3D MODELING & RENDERING	15
3D Modeling using Revit, auto cad .Wire frame , surface & solid modeling. Rendering using 3DSMax & Presentation Techniques		
UNIT-III	WALKTHROUGH	15
Presentation through still images & walkthrough		
UNIT-IV	ANIMATION	15
Various animation techniques, editing animation using key frames, curve editor/dope sheet, animation constraints/controller, rendering and special effects, walk through.		
UNIT-V	EXERCISES	20
Exercises using the above mentioned softwares for the designs done as a part of the design studio classes.		
		TOTAL: 75 PERIODS

REFERENCES:

1. Randi L. Derakhshani, DariushDerakhshani (2014) Autodesk 3DS Max 2013 Essentials(1st ed.), Autodesk Official Press
2. Kelly L Murdock ,Autodesk 3DS Max Bible.
3. Ami Chopine (2011), 3D Art Essentials: The Fundamentals of 3D Modeling, Texturing, and Animation(1st ed.)

UNIT-I GENERAL BUILDING REQUIREMENTS**5**

Classification of buildings - Sites and Services - Requirements of parts of buildings.

UNIT-II MODERN MATERIALS OF CONSTRUCTION**9**

Fibre reinforced polymer and lightweight concrete Ferro cement - High strength steel – Pre stressing tendons - Light gauge sectional - plastics - fibreglasses - Materials storage practices.

UNIT-III CONSTRUCTION SYSTEMS**9**

Planning - Cast in situ construction (ready mixed pumped etc. Reinforced concrete and pre stressed concrete constructions precast concrete and pre- fabrication system - Modular coordination - Structural schemes.

UNIT-IV CONSTRUCTION PRACTICE**9**

Manufacture, storage, transportation and erection of precast component forms, moulds and scaffoldings in construction - safety in erection and dismantling of constructions.

UNIT-V CONSTRUCTION EQUIPMENT**13**

Uses of the following: Tractors, bulldozers, shovels dragging, cableways and belt conveyors, batching plants - Transit mixers and agitator trucks used for-ready mix concrete pumps Guniting equipments - Air compressors - welding equipment - cranes and other lifting devices Choice of construction equipment for different types of works.

TOTAL: 45 PERIODS**REFERENCES:**

1. National Building Code of India, 1983 -
2. Frank R. Dagostino, Materials of Construction - Details given Reston. Publishing Company, nc. Virginia, 1976.
3. R. Chudley, Construction Technology, Longman Group Limited, England, 1985
4. R. Barry, The Construction of Buildings, The English Language Book Society and Crosby
5. Lockwood, Staples, London. 1976 ;,
6. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983

WEBSITES<http://www.asbi-assoc.org/><http://www.cerf.org/><http://www.members.ao1.com/ndtmans/index.html>

UNIT-I INTRODUCTION TO PROJECT MANAGEMENT**6**

Introduction to project Management concepts - background of management, purpose, goal and objectives, characteristics of projects and different aspects of management. Traditional management system, Gantt's approach loads chart, progress-chart, and bar-chart merit sand lirnitationa Schedule, time estimates units

UNIT-II PROJECT PROGRAMMING**6**

Project programming, resources balancing, phasing of activities, programmes, scheduling, project control, reviewing, updating and monitoring.

Introduction to modern management, concepts, one-dimensional management techniques - Introduction to PERT and CPM introduction to network concepts, network elements and inter-relationships.

UNIT-III NETWORK TECHNIQUES**12**

Network techniques, network logic - interrelationships, activity information, data sheets, and development of network.

CPM for management, CPM network analysis, identification of critical path floats computation result sheets.

UNIT-IV PERT NETWORK**6**

PERT Network, introduction to the theory of probability and statistics, probabilistic time estimation for the activities of PERT network.

UNIT-V PROJECT COST**15**

Introduction to two dimensional network analyses, activity cost information. Cost time relationship, crashed estimates for the activities, compression potential, cost slope, utility, data sheet, project direct cost and indirect cost.

Crashed programmes, network compression least cost solution least time solution, optimum time solution.

Network techniques, PERT/CPM, generating alternative strategies using computers

TOTAL: 45 PERIODS**REFERENCES:**

1. Dr. B.C. PunmiyaandK.K Khandelwal - Project Planning and Control with PEP-TXCPM Laxmi Publications, New Delhi, 1987.
2. S.P. Mukhopadyay, Project Management for Architects and Civil Engineers, IIT, Kharagpur, 1974.
3. Jerome D. Wiest and Ferdinand K. Levy, A Management Guide to PERT/CPM, Prentice Hall of Indian Pub.Ltd. New Delhi, 1982.
4. SR.A. Burgess and G. White, Building production and Project Management, The Construction Press, London 1979.

BAR17E09

URBAN HOUSING

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UNIT-I HOUSING ISSUES - INDIAN CONTEXT 4

Need and Demand - National Housing Policy - Housing Agencies and their role in housing development impact of traditional life style.

UNIT-II STANDARDS AND REGULATIONS 5

DCR relevant to Housing - Methodology of formulating standards - Performance standards.

UNIT-III HOUSING DESIGN 9

Traditional patterns - Row Housing and Cluster Housing - Layout concepts - Use of open spaces - Utilities and common facilities - Case studies - High Rise Housing.

UNIT-IV HOUSING PROCESS 9

Various stages and tasks in Project Development - Housing Management - Community participation - Environmental aspects - Technology.

UNIT-V SOCIO-ECONOMIC ASPECTS 9

Social factors influencing Housing Design, affordability, economic factors and Housing concepts - Slum Up gradation and Sites and Services. Rehabilitation of slums and squatters settlement - options and methodology.

UNIT-VI INNOVATIVE HOUSING DELIVERY SYSTEM 9

Public Private Partnership in housing delivery system. Transfer of - Development right, core house concept for social housing delivery system. NGO / CBO based delivery system and self help group housing. Slums and Squatter housing. Micro credit mechanism in support of informal sector housing

TOTAL: 45 PERIODS

REFERENCES:

1. Richard Untermanu & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company. London/New York, 1977.
2. Joseph de Chiara & 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. Christopher Alexander, A Pattern Language, Oxford University Press, New York - 1977.
5. HUDCO Publications - Housing for the Low income, Sector Model.
6. Public Private Partnership in Housing Infrastructure delivery in India By LT.Col. A B Das.

WEBSITES

www.hudcoindia.com/

www.indiabuildnet.com/arch/sangath-8.htm

OBJECTIVE:

To understand the values of conservation and the various factors that affects the values of conservation.

UNIT-I**9**

Introduction - Definition of the term Conservation, Heritage, Culture in Architectural context - Various stages in conservation such as Preservation, Restoration, Adaptation, Consolidation- Study of history of Conservation movement -Need for conservation in modern context.

UNIT-II**9**

Historic Cities - Factors affecting the Architectural aspects of historic cities- geographical, social, cultural and religious. Case Study of historic cities- Shahjahanabad, Madurai, Pondicherry

UNIT-III**9**

Ethics of Conservation - Values in conservation- Social, Economical, Religious and Use Values - Planning guidelines - Legislation related to Architectural Conservation.

UNIT-IV**9**

Charters in development of Conservation – Conservation Agencies like ASI, INTACH, Research and Funding Organisations like UNESCO – Components in conservation: Inventory, Listing, Documentation, Education, Community Participation and creating Public awareness.

UNIT-V**9**

Case studies of conservation Projects in Indian and International Context. Emerging trends in Conservation Practices.

TOTAL: 45 PERIODS**TEXT BOOK:**

1. Conservation of Historic Buildings – Bernard Fielden.
2. INTACH Handbook – INTACH Publications

REFERENCES:

1. The Architecture of Towns and Cities – Paul do Spreiregen.
2. Urban Renewal in Amercian Cities – Scott Greet.
3. Character of Towns – Roy Workhest.
4. Conservation of European cities, Donald Appleyard, 1979
5. Architectural Heritage of Pondicherry, INTACH publication

AIM:

To provide an overview of the concepts of sustainable practices in planning the built environment.

OBJECTIVE:

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.

To familiarize the students with the various rating systems for building practices with case studies.

Through case studies to understand the concept of sustainable communities and the economic and social dimensions.

UNIT-I**5**

Concept of Sustainability – Carrying capacity, sustainable development – Bruntland report – Ethics and Visions of sustainability.

UNIT-II**5**

Eco system and food chain, natural cycles – Ecological foot print – Climate change and sustainability.

UNIT-III**15**

Selection of materials Eco building materials and construction – Biomimicry, Low impact construction, and recyclable products and embodied energy, life cycle analysis. Energy

UNIT-IV**10**

Green building design –Rating system –LEED, GRIHA, BREEAM etc. case Studies.

UNIT-V**10**

Urban ecology, social and economic dimensions of sustainability, urban heat Island effects, sustainable communities – Case studies.

TOTAL: 45 PERIODS**REFERENCES:**

1. Sustainable Architecture and Urbanism: Concepts, Technologies and examples by Gauzin-Muller(D) – Birkhauser 2002.
2. Eco-Tech : Sustainable Architecture and High Technology by slessor© - Thanos and Hudson 1997.
3. Ecodesign : A manual for Ecological Design by Yeang(K) wiley Academy 2006.

REQUIRED READINGS:

1. Sustainable Architecture : Low tech houses by Mostaedi (A) – Carles Broto 2002.
2. HOK guide book to sustainable design by Mendler (S) & Odell (W) – John Willey and sons 2000.
3. Environmental brief : Path ways for green design by Hyder (R) - Taylor and Francis 2007.
4. Green Architecture: Design for a sustainable future by Brenda and Vale (R) - Thames and Hudson 1996.

AIM:

The course is designed to impart the basic knowledge in Safety, security and building automation and integrated building management systems

OBJECTIVES:

To familiarize the student with minimum safety requirements for a high rise building with exposure to NBC.

To study fire alarm systems and fire suppression systems and their installation.

To inform students of various types of security systems and their application in building.

To outline the importance and objectives of an integrated building management system.

CONTENT:**UNIT-I SAFETY REQUIREMENTS 5**

Minimum safety requirements for a building, particularly for a high rise building as per the National Building Code.

UNIT-II FIRE ALARM SYSTEMS 10

Objectives of a Fire Alarm System, Essential components of a Fire Alarm System, Technology of detection, Type of Statutory Standards followed in direction, Explanation on the essential clauses, various types of technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm System is designed and installed

UNIT-III FIRE SUPPRESSION SYSTEMS 12

Objectives of a Fire Suppression System, Explanation on fire triangle, Essential components of a Fire Suppression System, different types of Fire Suppression Systems, Type of Statutory Standards followed in Suppression, Explanation on the essential clauses and basic knowledge on how a Fire Suppression System is designed and installed.

UNIT-IV SECURITY SYSTEMS 10

Introduction to different types of Security Systems and why they are required. Introduction to Access Control, CCTV, Intruder Alarm and Perimeter protection Systems, Essential components of each system, various types of technologies employed in these Systems, basic knowledge on how they are designed and installed.

UNIT-V INTEGRATED BUILDING MANAGEMENT SYSTEM 8

The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

TOTAL: 45 PERIODS

REQUIRED READING:

1. Building Automation Systems – A Practical Guide to selection and implementation – Author: Maurice Eyke
2. National Building Code of India 1983 (SP 7:1983 Part IV) – Published by Bureau of Indian Standards
3. IS 2189 – Selection, Installation and Maintenance of Automatic fire Detection and Alarm System – Code of Practice (3rd Revision) – Published by Bureau of Indian Standards.

REFERENCES:

1. The Principles and Practice of Closed Circuit Television – Author: Mike Constant and Peter Turnbull
2. Rules of Automatic Sprinkler Installation – 2nd Edition – Published by Tariff Advisory Committee.
3. Fire Suppression Detection System – Author : John L. Bryan
4. Design and Application of Security/Fire Alarm system – Author: John E. Traister.
5. CCTV Surveillance – Author: Herman Kruegle
6. Security Systems and Intruder Alarm Systems – Author: Vivian Capel

AIM:

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.

OBJECTIVES:

To understand the fundamentals of Earthquake and the basic terminology

To inform the performance of ground and buildings.

To familiarise 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

CONTENT:**UNIT-I****7**

Fundamentals of earthquakes

Earth's structure, seismic waves, plate tectonics theory, origin of continents, seismic zones in India.

Predictability, intensity and measurement of earthquake

Basic terms-fault line, focus, epicenter, focal depth etc.

UNIT-II**8**

Site planning, performance of ground and buildings

Historical experience, site selection and development

Earthquake effects on ground, soil rupture, liquefaction, landslides.

Behaviour of various types of buildings structures, equipments, lifelines, collapse patterns

Behaviour of non-structural elements like services, fixtures in earthquake-prone zones

UNIT-III**10**

Seismic design codes and building configuration

Seismic design code provisions – Introduction to Indian codes

Building configuration- scale of building, size and horizontal and vertical plane, building proportions, symmetry of building- torsion, re-entrant corners, irregularities in buildings-like short stories, short columns etc.

UNIT-IV**10**

Various type of construction details

Seismic design and detailing of non-engineered construction- masonry structures, wood structure, earthen structures.

Seismic design and detailing of RC and steel buildings

Design of non-structural elements- Architectural elements, water supply, drainage electrical and mechanical components

UNIT-V**10**

Urban planning and design

Vulnerability of existing buildings, facilities planning, fire after earthquake, socio-economic impact after earthquakes.

Architectural design assignment – Institutional masonry building with horizontal spread and height restriction, multi-storied, r.c.c framed apartment or commercial building.

TOTAL: 45 PERIODS

REQUIRED READING:

1. Guidelines for earthquake resistant non-engineered construction, National Information centre of earthquake engineering (NICEE, IIT Kanpur, India)
2. C.V.R. Murthy, Andrew Charison. "Earthquake design concepts", NICEE, IIT Kanpur India.

REFERENCES:

1. Lan Davis (19987) "Safe shelter within unsafe cities" Disaster vulnerability and rapid urbanization, Open House International, UK
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, 1992, Orvieto, Italy.

PURPOSE:

To understand the technological, environmental and socio – economic aspects of Smart cities.
To understand how and to what extent cities are changing, following or contrasting the path of the so called “Smart City Revolution”.

OBJECTIVES:

To examine the core challenges relating to the foundation of Smart cities.
To develop knowledge, understanding and critical thinking related to Smart, sustainable urban development.
To explore issues relating to the development and deployment of new and emerging technologies, that will create a thorough understanding of smart processes and systems of the present and future.

UNIT-I INTRODUCTION TO SMART CITIES 8

Urban Scenario, Challenges in cities, Smart City definition, Evolution of Smart cities, Characteristics and factors of Smart Cities, Drivers of Smart Cities.

UNIT-II SMART CITY INFRASTRUCTURE 9

Physical, economic, Social, Institutional – Urban Mobility , Water Management, Waste Management, Energy Management, Smart Technology-IOT, e-Governance ,etc.

UNIT-III SMART CITY DEVELOPMENT 8

Traditional Vs Smart Cities, UDPFI guidelines, Strategies, Transformation- Process, Selection, Implementation, funding of Smart cities and Monitoring.

UNIT-IV GLOBAL EXPERIENCE OF SMART CITIES 10

Smart City Projects - Global Case Studies- - Barcelona, Amsterdam, Masdar, Singapore,etc.

UNIT-V TOWARDS SMART CITIES IN INDIA 10

Smart City Mission in India- Smart Cities Policies, guidelines & Benchmarks- Regulatory Bodies for the Smart Cities Mission- Funding Model for Smart Cities in India-Completed and Ongoing Smart City Projects in India

TOTAL : 45 PERIODS**REFERENCES:**

1. Jesse Berst, Liz Enbysk and Christopher Williams Smart Cities Readiness Guide - The planning manual for building tomorrow’s cities today, Smart Cities Council, 2014
2. Aniket Bhagwat, Suparna Bhalla, Sanjay Prakash Ashish Bhalla Destination 100 (The Making of Smart Cities in India, Future Institute publishers, 2014, ISBN 13: 9781 4392 57883
3. Vinod kumar T. M., Geographic Information Systems for Smart Cities, Copal Publishing, New Delhi, 2014, ISBN: 9788 1924 73352
4. Joy Sen, Sustainable Urban Planning, The Energy and Resources Institute, New Delhi, 2013, ISBN 978-81-7993-324-4
5. Anthony M. Townsend, SMART CITIES Big Data, Civic Hackers, and the Quest for a New Utopia, W. W. Norton & Company, Inc., 2013, ISBN-13: 978-0393082876

PURPOSE:

To inculcate the basic concepts of pre stressing

To familiarize the students with the tall building structural system and various types of shells and folded plates.

To introduce the basic concepts of Space Frames, Shells and folded plates and Tensile structures

INSTRUCTIONAL OBJECTIVES:

By the end of the course the student shall be capable of designing Shells and Space Frames. The student shall have sufficient knowledge to suggest appropriate tall structural systems, shells and folded plates and tensile structure for the space coverage.

UNIT-I PRE STRESSED CONCRETE**9**

Introduction to pre stressed concrete - Pre stressed concrete materials - Methods of pre stressing - Analysis and approximate design of determinate beams - losses of pre stressing - Comparison between RCC and pre stressed concrete.

UNIT-II TALL BUILDINGS**10**

Tall building structural system - Rigid frames - Braced frames - Shear wall - Buildings - Wall frame buildings - Tubular buildings - Tube-in tube buildings - Outrigger braced system - Brief outline of their behaviour and their applicability for various heights of buildings.

UNIT-III SPECIAL STRUCTURES**9**

Definitions, Types - single, double & multilayered grids - two way & three way space grids, connectors, Grids - Domes - various forms - Geodesic domes.

UNIT-IV SHELLS AND FOLDED PLATES**8**

Shells - Types - Classification as per BIS - Stress resultants - Relative merits and applicability. Folded plates - Types - Comparison with shells - Applicability. Arches - Basic concepts - Analysis of three hinged arches.

UNIT-V TENSILE STRUCTURES**9**

Suspended cable structures - types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures - types of pneumatic structures.

TOTAL: 45 PERIODS**TEXTBOOKS:**

1. Sinha. N.C. and Roy.S.K, Fundamentals of Reinforced Concrete, S.Chand & Co. Ltd., New Delhi, 2001
2. Ramamruthm.S and Narayanan. R, Reinforced Concrete Structures, Dhanpat Rai Publications, New Delhi, 1997
3. Bryan Stafford and Alex Coull, Tall Buildings Structures, Analysis and Design John Wiley & Sons, New York, 1991

REFERENCE BOOKS:

1. Bandyopadhyay. J.N, Thin Shell Structures Classical and Modern Analysis, New Age International Publishers, New Delhi, 1998
2. Ramaswamy.G.S, Design of Construction of Concrete Shell Roofs, McGraw Hill Publishing Company, New York, 1986
3. Krishna Raju. N, Pre Stressed Concrete, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1988
4. Taranath. B.S, Structural Analysis and Design of tall Buildings, McGraw Hill, New York, 1988

PURPOSE:

To understand human psychology and behavioral pattern.

UNIT-I HUMAN BEHAVIORAL PATTERN 7

Analysis of human mind & his or her image world. Human being and social behavioural patterns in various public & private areas.

UNIT-II TERRITORIAL & GROUP PSYCHOLOGY 7

Human behavior in a group of two, three, and more. Activities and its relationship with grouping of people. Privacy, territoriality & defensible space.

UNIT-III MODERNIZATION & IMPACTS ON HUMAN BEHAVIOUR 7

Modernization, change in society, change in thought process and behavioral patterns. Behavior and its co relation to design elements.

UNIT-IV BEHAVIOUR PATTERN & SPACE PLANNING 9

Relation of behavior patterns of human being in space planning for public areas like theatre lounge, waiting rooms, hotel foyer, café and other rooms

TOTAL: 30 PERIODS

REFERENCES:

1. An Introduction to Social Psychology,Chapter 8: Behavior Patterns: Their Nature and Development By,Luther Lee Bernard
2. The Psychology of the Interior , Agnieska Mlicka
3. Baudrillard, J. (1996). The System of Objects (Verso English Edition). United Kingdom: Bookmarque.
4. Mackenzie, N.E.; M.A. Wilson (2000). "Social Attributions Based on Domestic Interiors". Journal of Environmental Psychology 20: 343-354.
5. Rice, Charles (2007). The Emergence of the Interior. Oxon: Routledge.
6. Edwards, M.J.; W.G. Gjertson (September 2008). "La Maison de Verre: Negotiating a Modern Domesticity". Journal of Interior Design

INSTRUCTIONAL OBJECTIVES:

Understand the process and procedure involved in setting up a small enterprise.
 Acquire the necessary managerial skills required to run a small-scale industry.
 Know the pros and cons in becoming an entrepreneur.

UNIT-I**6**

Entrepreneur –Meaning – Definition – Characteristics – Functions – Role of Entrepreneurs in the economic development – Classification of entrepreneurs – Factors affecting entrepreneurial growth.

UNIT-II**6**

Entrepreneurship – Concept – Distinction between Entrepreneur and Entrepreneurship - Entrepreneurship Development Programmes – Objectives - Stages in EDP- Pre-training Stage – Training phase – Post Training – Evaluation and Feedback of EDP.

UNIT-III**6**

Project Identification - Sources of ideas – Preliminary evaluation and testing of ideas – Constraints - Project formulation – Stages- Feasibility study and Feasibility Report – Selection Criteria.

UNIT-IV**6**

Project Report - Project Appraisal – Technical – commercial appraisal –Financial appraisal– Sources of finance – Steps to star an industrial unit.

UNIT-V**6**

Incentives and subsidies of State and Central Govt. – Aims – Backward areas – Industrial Estates – Role of DIC,SISI, TCO in entrepreneurial growth.

TOTAL: 30 PERIODS**REFERENCE BOOKS:**

1. Singh,P,N(1986) Developing Entrepreneurship for Economic Growth.
2. Guide to Entrepreneurs – Industrial Development – Govt. of Tamil Nadu – SIPCOT
3. Guide to Entrepreneurs – Industrial Development – Govt. of Tamil Nadu – SIPCOT
4. Thierry Burger Helmchen(2012), Entrepreneurship Born, Made and Educated, Marina Jozipovic.
5. Thierry Burger Helmchen(2012), Entrepreneurship Creativity and Innovative Business Models, Marina Jozipovic.