



**B.ARCH - BACHELOR OF ARCHITECTURE  
 (FIVE YEAR FULL TIME)  
 CURRICULUM 2008**

**SEMESTER I**

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR101	Architectural Mathematics	2	0	0	2
2.	XAR102	History of Architecture - I	2	1	0	3
<b>THEORY CUM STUDIO</b>						
3.	XAR103	Communication English	1	0	2	2
4.	XAR104	Architectural graphics – I	1	0	4	3
5.	XAR105	Materials and construction I	2	0	3	4
<b>STUDIO</b>						
6.	XAR106	Visual arts	0	0	6	3
7.	XAR107	Basic Design	2	0	9	7

**Total Hours: 35**

**Total Credit: 24**

**SEMESTER II**

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR201	Mechanics of Structures – I	3	0	0	3
2.	XAR202	History of Architecture – II	3	0	0	3
3.	XAR203	Theory of architecture I	3	0	0	3
<b>THEORY CUM STUDIO</b>						
4.	XAR204	Architectural graphics – II	1	0	4	3
5.	XAR205	Materials and Construction II	2	0	3	4
<b>STUDIO</b>						
6.	XAR206	Creative workshop and model making	0	0	4	2
7.	XAR207	Architectural Design – I	0	0	12	6
8.	XAR208	Workshop on Arts and Crafts	10 days			3

**Total Hours: 35**

**Total Credit: 27**

### SEMESTER III

Sl. No.	Code No.	Course Title	L	T	P	C
1.	XAR301	Mechanics of Structures – II	3	0	0	3
2.	XAR302	History of Architecture – III	2	1	0	3
3.	XAR303	Theory of Architecture II	2	1	0	3
<b>THEORY CUM STUDIO</b>						
4.	XAR304	Climate & Architecture	2	0	1	3
5.	XAR305	Materials and Construction III	2	0	3	4
6.	XAR306	Computer Applications -I	1	0	3	3
<b>STUDIO</b>						
7.	XAR307	Architectural Design - II	0	0	14	7

**Total Hours: 35**

**Total Credit: 26**

### SEMESTER IV

Sl.No.	Code No.	Course Title	L	T	P	C	
1.	XAR401	Design of Structures – I	3	0	0	3	
2.	XAR402	History of Architecture – IV	2	1	0	3	
3.	XAR403	Building Services – I	2	1	0	3	
4.	XAR404	Environmental Sciences	2	1	0	3	
<b>THEORY CUM STUDIO</b>							
5.	XAR405	Materials and Construction IV	2	0	3	4	
6.	XAR406	Computer Applications -II	1	0	3	3	
<b>STUDIO</b>							
7.	XAR407	Architectural Design – III	0	0	14	7	
8.	XAR408	Workshop on Construction	10 days				3

**Total Hours: 35**

**Total Credit: 29**

## SEMESTER V

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR501	Design of Structures – II	2	1	0	3
2.	XAR502	Contemporary Architecture – I	2	1	0	3
3.	XAR503	Building Services - II	2	1	0	3
4.	XAR504	Architectural Acoustics	2	1	0	3
<b>THEORY CUM STUDIO</b>						
5.	XAR505	Materials and Construction V	2	0	3	4
6.	XAR506	Site Planning	2	0	2	3
<b>STUDIO</b>						
7.	XAR507	Architectural Design – IV	0	0	14	7

**Total Hours: 35**

**Total Credit: 26**

## SEMESTER VI

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR601	Design of Structures – III	2	1	0	3
2.	XAR602	Contemporary Architecture – II	2	1	0	3
3.	XAR603	Building Services – III	2	1	0	3
4.	XAR604	Specification and cost estimation	2	1	0	3
5.	XAR605	Urban Economics & Social Engineering	2	1	0	3
<b>THEORY CUM STUDIO</b>						
6.	XAR606	Materials and Construction VI	2	0	4	4
<b>STUDIO</b>						
7.	XAR607	Architectural Design – V	0	0	14	7
8.	XAR608	<b>Workshop on Services</b>	<b>10 days</b>			<b>3</b>

**Total Hours: 35**

**Total Credit: 29**

### SEMESTER VII

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR701	Entrepreneurial Development Management	2	1	0	3
2.	XAR702	Practical Training	0	0	0	18

**Total Hours: 35**

**Total Credit: 21**

### SEMESTER VIII

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR801	Town Planning and Human Settlements	2	1	0	3
2.	XAR802	Vernacular architecture	2	1	0	3
3.	XAR803	Housing & real estate	2	1	0	3
4.	XAR804	Elective - 1	2	1	0	3
<b>THEORY CUM STUDIO</b>						
5.	XAR805	Elective – 2	2	0	2	3
6.	XAR806	Appropriate Building Technology	2	0	3	4
<b>STUDIO</b>						
7.	XAR807	Architectural Design – VII	0	0	14	7

**Total Hours: 35**

**Total Credit: 26**

### SEMESTER IX

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR901	Professional Practice	2	1	0	3
2.	XAR902	Landscape Design	2	1	0	3
3.	XAR903	Project Management & TQM	2	1	0	3
4.	XAR904	Elective – 3	2	1	0	3
5.	XAR905	Elective – 4	2	1	0	3
<b>THEORY CUM STUDIO</b>						
6.	XAR906	Contemporary Building Technology	2	0	2	3
<b>STUDIO</b>						
7.	XAR907	Architectural design – VIII	0	0	16	8

**Total Hours: 35**

**Total Credit: 26**

### SEMESTER X

Sl.No.	Code No.	Course Title	L	T	P	C
1.	XAR1001	Thesis	0	0	0	20

**Total Hours: 35**

**Total Credit: 20**

**Over all Credits: 254**

## LIST OF ELECTIVES FOR B.ARCH.

### ELECTIVE 1 (Eighth semester)

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR804A	Traditional Indian Architecture	2	0	0	2
2.	XAR804B	Behavioral studies in built environment	2	0	0	2
3.	XAR804C	Architecture Criticism	2	0	0	2
4.	XAR804D	Theory of design	2	0	0	2

### ELECTIVE 2 (Eighth Semester)

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR805A	Green Architecture -I	2	0	2	3
2.	XAR805B	Digital Architecture	2	0	2	3
3.	XAR804C	Furniture design making	2	0	2	3
4.	XAR804D	Architectural Lighting -I	2	0	2	3

### ELECTIVE 3 (Ninth Semester)

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR904A	Architectural Conservation	3	0	0	3
2.	XAR904B	Urban Design and Renewal	3	0	0	3
3.	XAR804C	Properly Maintenance & Management	3	0	0	3
4.	XAR804D	Housing & Real Estate	3	0	0	3

### ELECTIVE 4 (Ninth Semester)

Sl.No.	Code No.	Course title	L	T	P	C
1.	XAR905A	Building Management Systems	3	0	0	3
2.	XAR905B	Green Architecture –II	3	0	0	3
3.	XAR905C	Architectural Lighting – II	3	0	0	3
4.	XAR905D	Medical Architecture	3	0	0	3

## B.ARCH - ARCHITECTURE

### SYLLABUS

**XAR101 - ARCHITECTURAL MATHEMATICS** **2 0 0 2**

**UNIT I INTEGRATION & FUNCTION OF TWO VARIABLES** **7**

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

**UNIT II ORDINARY DIFFERENTIAL EQUATIONS** **5**

Linear, second order and higher order Differential equations with constant coefficients Differential equations with variable coefficients of Euler type.

**UNIT III BASIC STATISTICS AND PROBABILITY** **6**

The arithmetic mean, median, mode, standard deviation and variance Regression and correlation, elementary probability theory, conditional probability.

**UNIT IV TRIGONOMETRY AND MENSURATION** **6**

Trigonometric (sine, cosine and tan functions) and exponential function, de-moivre's theorem. area of plane figures, computation of volume of solid figures.

**UNIT V GEOMETRY IN ARCHITECTURE** **6**

Ratio and systems of proportion – definition and derivation of golden ratio, Fibonacci series

**TOTAL: 30**

#### TEXT BOOKS:

1. B.S. Grewal , Higher Engineering Mathemaics, Khanna Publishers, Delhi 1995
2. P. Kandasamy, K. Thilakawathy and K. Gunawathy, Engineering Mahematics Vol.1 and II, S. Chandan Publisher – 1998
3. Kappraff Jay, Connections; The Geometric bridge between art and science. McGraw Hill Inc. Ltd., USA , 1991.



**REFERENCES:**

1. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams, Inc.Pub., New York, 1972.
2. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986.
3. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985. Gosta, E.Samdstrp, Man the Builder, McGraw-Hill Book Company, New York, 1970.

**WEBSITES:**

1. <http://library.advanced.org/10098>
2. <http://www.encyclopedia.com/articles/05371.html>
3. <http://www.cup.org/Titles/09/0521094526.html>

**UNIT I READING COMPREHENSION AND SUMMARISING 12**

Comprehension of technical and non-technical materials, skimming, scanning inferring, predicting and responding to content. Comprehension, application, evaluation, information structure, study skills, note making, summarizing.

**UNIT II LISTENING, SPEAKING AND DIALOGUE WRITING 12**

Listening with understanding to recorded, Structured talks and class room lectures – Comprehending the matter – Understanding the link between different parts of speech sounds. Stress, intonation, question tag, asking and answering questions, dialogues, description of objects, fluency, role play, three minute speeches.

**UNIT III WRITING – ANALYTICAL ESSAY WRITING 6**

Generating and organizing ideas, effective sentences, cohesive paragraphs, clear and concise writing, supporting ideas with example or evidence, verifying contradictory points, arriving at a consensus.

**UNIT IV TECHNICAL REPORT WRITING 6**

Introduction to technical writing A) Technical reports Definition' Types B) Mechanism of writing, Unity, Coherence. Appropriateness; Brevity, Clarity; Understanding the Reader C) Use of Graphics; Selection; Construction: Placement and interpretation. D) Division into parts; writing bibliography; footnotes E) Presentation margin, spacing, numbering of sections; lettering; punctuation; symbol; abbreviation; units of measurement; mathematical expressions. F) Resume writing, G) Writing a scientific paper

**UNIT V DISCUSSION 9**

A) Discussion to select a project topic, thesis statement; decision on methodology, interpretation of graphics; discussion on general topics; peer learning,. B) Preparation and delivery of short speeches on general topics C) Use of visual aids; poise D) Assessment of performance in group discussion, short speeches and interviews based on a set criteria

**TOTAL: 45****TEXT BOOKS:**

1. Jajatilake, C.I.V. and S. Sivasegaram, "Technical Report Writing". Tata Mc Graw Hill Publishing Corporation Ltd., New Delhi 1979
2. Sasikumar.V. and P.V. Damija "Spoken English". Tata McGraw Hill Publishing Corporation Ltd., New Delhi, 1997

**REFERENCES:**

1. "How to Rad Fast and Better". Reader's Digest, 1983
2. Stanton Nicky,"Mastering Communicaiton". Mc Millan Master Series, London, 1996

## **XAR104 - ARCHITECTURAL GRAPHICS – I**

**1 0 4 3**

### **UNIT I GEOMETRICAL DRAWING**

**30**

Plane Geometry - scales and angle construction of planes, curves, circles tangent and regular polygon area construction. Solid geometry - simple projections, projection and development of the solid, section of solids, interpenetration of solids and true shape of sections.

### **UNIT II ORTHOGRAPHIC PROJECTION**

**15**

Introduction to orthographic projections - isometric and axenometric projections. Drawing of lines, basic shapes in different positions. Orthographic projections of planar surface - geometrical shapes like square, circle, hexagon, etc. and combination of shapes. Orthographic projection of 3D objections - construction of plan, elevation and section of 3D objects and projections in various positions.

### **UNIT III AXONOMETRIC PROJECTIONS & ISOMETRIC PROJECTIONS**

**30**

Introduction to orthographic projections - isometric and axonometric projections. Drawings of lines, basic shapes in different positions.

**TOTAL: 75**

#### **TEXT BOOKS:**

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

#### **REFERENCES:**

1. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by American Technical Society, 1966.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.
4. Alwyn Cranshaw, Learn to paint with Water colours, Acrylic colours, Boats and Harbours, Sketch, Still life, landscapes, William Collins Sons and Co. Ltd., London, 1981.
5. Tokyo Musashino Academy of Art - Introduction to Pencil Drawing, Graphic - Shaw Publishing Co. Ltd., Japan, 1991.
6. Robert S.Oliver, The Complete Sketch, Van Nostrand Reinhold, New York, 1989.

#### **WEBSITES:**

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

**UNIT I INTRODUCTION****10**

Functional requirements of a building and its components - Drawings of foundations, plinth, superstructure, roofing. Soils – Formation - grainsize distribution – soil classification systems. Lime - fat/Hydraulic Limes - Their uses and properties – Manufacturing process - Mortar, functions – requirements - mix proportions.

**Plates & Assignments****UNIT II RURAL - MATERIALS AND CONSTRUCTION****30**

Mud as a building material - Soil stabilisation, soil blocks - Drawings of foundations - types, S.S.Block – S.S. Castnsitu walls - flooring - roofing - plastering. Bamboo, casuarinas coconut, palm, hay, coir, jute – properties - uses - fire retardant treatment insect proofing. Types of foundations - walls - simple rooftrusses floors for rural structures.

**Assignments****UNIT III STONE****25**

Classification of rocks - Building stones - their uses –physical properties - brief study of tests for stone – deterioration - preservation of stone - various stone finishes - cutting and polishing of granites. Drawings of foundations - types of masonry - random rubble/Ashlar, etc. - cavity walls - flooring copings, sills, lintels, corbels, arches.

**Plates & Assignments****UNIT IV BRICKS AND CLAY PRODUCTS****10**

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

**Assignments****TOTAL: 75****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. Rural Construction - NBO, New Delhi

## **WEBSITES:**

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

**UNIT I FREEHAND DRAWING****35**

Techniques and principles of freehand drawing, drawing of various elements of nature and man made objects. Black and White medium; pencils, charcoals, pen and ink Introduction to concepts of colour application – Hue, intensity and value, primary, secondary and complimentary colours, shades and tints, warm and cool colours. Colour medium; water colour (Transparent & opaque), Poster colour, pastels, colour pencils, oils.

**UNIT II BASIC MODEL MAKING AND SCULPTURING****25**

Techniques and principles of model making and sculpturing for effective 3 dimensional perception and communication, using various materials. Study models/ conceptual models; perception and demonstration of form, depth, texture, and organization using clay, terracotta, thermacol, plaster-of-paris, papers, board, wire.

**UNIT III ARCHITECTURAL RENDERING****30**

Rendering techniques for architectural drawings; building perspectives – interiors and exteriors, building plans and site plans articulating features such as landscape, furniture human figures etc.,

Various mediums in Black and white ; pencils, sketch pens, charcoal, pen and ink colour, colour pencils, sketch pens, pastels, water colour, poster colour, oils.

**TOTAL: 90****TEXT BOOKS :**

1. Albert O.Halse, Architectural Rendering. A techniques of contemporary – presentation McGraw Hill Book Company, New York, 1972.
2. Mulick Milind, Water colour, Jyotsna Prakasan, Mumbai 2002.
3. Farey; A. Cyril, Architectural Drawing perspective and Rendering – A Hand book for students and draftsmen

**UNIT I INTRODUCTION TO DESIGN 20**

Definition of design - Design Thinking - Design Process - Design problems and solution

**UNIT II ELEMENTS OF VISUAL COMPOSITION 20**

Assignment shall be aimed at understanding role of the following basic elements of visual design existing in paintings, compositions, murals, sculptures, building and in a nature – Dots, Lines, Planes, Patterns, Shapes, Forms, Spaces, Colour, Texture, Levels, Light, Fenestration's.

**UNIT III PRINCIPLES OF VISUAL COMPOSITIONS 20**

The assignment shall be aimed at understanding and using principles like Repetition, Rhythm, Radiation, Focal point, Symmetry, Un symmetry, Background, Foreground, Sense of Direction, Harmony, Balance and Proportion.

**UNIT IV EXPLORING COLOUR SCHEMES AND ITS APPLICATION ON ARCHITECTURAL FORMS & SPACES 30**

Assignment on Colour shall be aimed at developing the skills to create Visually pleasing

Colour Schemes based on principles of Harmony and Contrast and degree of Chromatism.

**UNIT V STUDY OF TEXTURES AND TEXTURES SCHEMES 25**

Study of Openings for light, shadow, shades and sciography : This assignment shall be related to openings in the building, windows, roof, lighting and its impact on visual character of the space.

**UNIT VI STUDY OF SOLIDS AND VOIDS: 25**

This assignment shall include creation of abstract and semi abstract symbolic sculptural forms and spaces.

**UNIT VII STUDY OF LIGHT AND SHADE 25**

This assignment shall include use of different materials and create lighting and shading effects.

**TOTAL - 165****TEXT BOOKS:**

- 1.Maittand Graves – The Art of Colour and Design McGraw-Hill Book company Inc. 1951

## REFERENCES:

1. Edward D.Mills - Planning the Architects Hand Book - Bitterworth, London, 1985.
2. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
3. Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canaa), 1979.
4. John W.Mills - The Technique of Sculpture, B.T.Batsford Limited, New York - Reinhold Publishing Corporation, London, 1966. 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. Orbid Publishing Ltd., Know how the complete course in Dit and Home Improvements No.22, Bed fordbury, London, W.C.2, 1981.

## WEBSITES:

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

**XAR201 - MECHANICS OF STRUCTURES - I****3 0 0 3****UNIT I FORCES AND STRUCTURAL SYSTEMS 7**

Units of Measurement- Introduction to Scalar and Vector, Types of force systems - Resultant of parallel forces - principle of moments - principle of equilibrium – Free body Diagram- simple problems

**UNIT II ANALYSIS OF PLANE TRUSSES 10**

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

**UNIT III PROPERTIES OF SECTION 10**

Centroid and Center of Gravity- Moment of Inertia- Polar Moment of Inertia- Product of Inertia- Introduction to Moment of Inertia of Masses with simple problems - Section modules – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis

**UNIT IV ELASTIC PROPERTIES OF SOLIDS 10**

Stress strain diagram for mild steel, High tensile steel and concrete - Concept of axial and volumetric stresses and strains. Elastic constants - Relation between elastic constants - Application to problems.

**UNIT V BENDING MOMENT AND SHEAR FORCE 8**

Relation between loading. Shear force and bending moment – Shear force and bending moment diagrams for cantilever, simply supported and overhanging beams.

**TOTAL: 45****TEXT BOOKS:**

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

**REFERENCES:**

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

## **XAR202 - HISTORY OF ARCHITECTURE - II**

**3 0 0 3**

### **UNIT I ANCIENT INDIA**

**7**

Indus Valley Civilization - Culture and pattern of settlement. Impact of Aryan culture -Vedic village and the rudimentary forms of bamboo and wood Wooden construction under the Mauryan rule.

### **UNIT II BUDDHIST ARCHITECTURE**

**10**

Hinayana and Mahayana Buddhism - Interaction of Hellenic & Indian Ideas in Northern India - Architectural Production during Ashoka's rule - Ashokan Pillar, Sarnath, Rock cut caves at Barabar, Sanchi Stupa. Salient features of a Chaitya hall and Vihara, Rock cut architecture in the Western and Eastern ghats - Karli, Viharas at Nasik, Rani gumpha, daigiri. Takti Bahai, Gandhara.

### **UNIT III HINDU ARCHITECTURE**

**10**

Evolution of Hindu temple - Early shrines of the gupta and chalukyan periods – Tigawa temple, Ladh Khan and Durga temple, Aihold, Papanatha and Virupaksha temples, Pattadakal.

### **UNIT IV DRAVIDIAN ARCHITECTURE**

**10**

Dravidian culture - Rock cut productions under Pallavas –Shore temple, Mahaballipuram -Dravidian Order – Brihadeeswara Temple, Tanjore - Evolution and form of gopuram - Complexity in temple plan due to complexity in Ritual - Minakshi temple, Madurai.

### **UNIT V INDO ARYAN STYLE**

**8**

Salient features of an Indo Aryan temple - Lingaraja Temple, Bhuvanesar - Sun temple, Konarak. Kunds and Vavs – Sabali kund vav - Adalaj - Surya kund, Modhera.

**TOTAL: 45**

### **TEXT BOOKS:**

1. Percy Brown, Indian Architecture (Buddhist and Hindu Pd.) - Tarapore Vala and Sons Bomabay 1983.

## REFERENCES:

1. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt. Ltd., New Delhi, 1981.
2. 2.A.Volwahren, Living Architecture - India (Buddhist and Hindu), Oxford and IBM, London, 1969.
3. Christopher Tadgelli, The History of Architecture in India from the Dawn of civilization to the end of the Raj, Longman Group U.K. Ltd., London, 1990.
4. Carmen Kagal, Vistara: The Architecture of India, Published by Festival of India, 19861.

## WEBSITES:

1. <http://www.greatbuildings.com/gbc-types/styles/hindu.html>
2. <http://indianculture.tqn.com/msub19.htm>
3. [http://web1.arch.hawaii.edu/courses/courses/300/arch371/09\\_04/9-4htm](http://web1.arch.hawaii.edu/courses/courses/300/arch371/09_04/9-4htm)
4. [http://www.hindunet.org/alt\\_hindu/1995\\_Apt\\_1/msg00069.html](http://www.hindunet.org/alt_hindu/1995_Apt_1/msg00069.html)
5. <http://bishop.calpoly.edu/libarts/jwetzels/study/HinduArtOflaterDynasties.htm>

**XAR 203 - THEORY OF ARCHITECTURE-I****3 0 0 3****UNIT – I INTRODUCTION TO ARCHITECTURE****5**

Definition of Architecture, Architectural design - An analysis, Integration of aesthetic and function.

**UNIT – II ELEMENTS OF ARCHITECTURE****5**

Elements of Architecture backed by need and followed by fulfillment of need, primary elements of architecture – point, line, plane and volume.

**UNIT – III ARCHITECTURAL FORMS****5**

Form & space: Unity of opposites, Shapes, visual and emotional effects of geometric forms - The sphere, the cube, the pyramid, the cylinder and cone and their derivatives, Subtractive & additive forms – linear, radial, centralized, clustered, grid.

**UNIT – IV ARCHITECTURAL FORMS & SPACE****5**

Form defining space – horizontal elements, vertical elements. Space defining elements, openings in space-defining elements.

**UNIT – V COMPONENTS OF DESIGN****10**

Proportion, scale. Ordering principles - balance, rhythm, symmetry, datum, hierarchy, pattern and axis with building examples.

**TOTAL : 30****TEXT BOOKS:**

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

**REFERENCES:**

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



### **III. Sciography**

1. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.  
Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, New York, 1975.
2. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.
3. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
4. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.

### **WEBSITES:**

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

**UNIT I BRICKS AND CLAY PRODUCTS 15**

Drawings of brick foundations - buildings in brickwork, bonds columns, corners – structural members in brickwork. Reinforced brick masonry - Arches - Lintels – Corbels - copings. Hollow clay blocks - for walls - partitions - roofs. Roofings - Flat Roofs - or Terrace roofs - Sloping roofs.

**Plates & assignments****UNIT II TIMBER AND ALLIED PRODUCTS 15**

Softwood and hardwood - Physical properties and uses - Defects, Conversion, Seasoning, decay and preservation of timber - Fire retardent treatment, anti-termite treatment. Industrial timbers - plywood, blockboard, particle board, fibre boards. Manufacture and uses - current developments.

**Assignments****UNIT III TIMBER JOINERY 35**

Drawings of timber joinery for Windows, doors, ventilators. Timber partitions, panelling, false ceiling, fixed partitions, sliding, folding, top hung bottom rested false ceiling – wall panelling. Timber staircases - Designed staircase - timber trusses - Lean to – close couple - Kingpost - Queen pot - Trusses. Timber floors - timber built-in-furniture –

**Plates & Assignments****UNIT IV COST EFFECTIVE BUILDING TECHNOLOG 10**

Drawings of foundations – walling – Roofs – partitions – ceiling panel – doors and windows. Miscellaneous – Drawing of Brick jallies, Screen walls – pavement blocks – Ferrocement water tanks-

**Assignments****TOTAL: 75****TEXT BOOKS:**

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

**REFERENCES:**

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

**WEBSITES:**

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

**XAR206 - CREATIVE WORKSHOP AND MODEL MAKING**

**0 0 4 2**

**STAGE I**

**30**

Introduction to carpentry tools and machines.  
Introduction to modeling with different materials.  
Basic model making techniques.

**STAGE II**

**30**

Identification and selection of timber, Timber finishes, varnish, polish etc.  
Block models of small campuses using wood, thermacol mount board, soap, cork board, etc.  
Detailed model of a small building like branch bank, small residences, bus shelter, snack bar, including landscape details.  
Elementary models which are functional and useful in day to day life

**TOTAL: 60**

**REFERENCES:**

1. Arundell (Jan), Exploring Sculpture, Mills and Boon, London/Charles T.Branford Company, USA, 1972.
2. John W.Mills, The Technique of Sculpture, B.T.Batsford Ltd., New York Reinhold Publishing Corpn., London, 1966.

**WEBSITES:**

1. [www.designbasics.com/](http://www.designbasics.com/)-(on house type – Americans)
2. <http://www.geosystems.gatech.edu/> - (on detail design method)
3. <http://www.c.s.berkeley.edu/> - (on bubble diagram builder with interaction)
4. <http://www.plannet.com/resources.htm> - (on resource info)

**STAGE I**

In this term sessional work should be related to preparation of actual measured drawings at selected locations rural in nature and further elaborated with notes on form, functions utility, method of construction etc. This exercise shall be followed by a design problem by studying the anthropometric details and to understand the function of a single space unit such as

1. Living area, bed room, stalls, booths, bus-stops etc.
2. Shop, Workshop, pavilions, snack bar, cafeteria.

The design problem shall also take into consideration activities and their relationship with spaces function, Scales and proportions, climate.

**TOTAL: 180****TEXT BOOKS:**

1. De. Chiara and Callender, Time-saver Standards for Building Types, McGraw-Hill Co., New York, 1973.

**REFERENCES:**

1. E and O.E. Planning, Liffle Books Ltd., London, 1973.
2. Sid Del Mar
3. Leach, Techniques of Interior Design Rendering and presentation, McGraw-Hill Co., New York, 1973.

**XAR208 - WORKSHOP ON ARTS AND CRAFTS****10 Days 3**

Intensive training on murals, life size sculpture making.

**XAR301 - MECHANICS OF STRUCTURES – II****3 0 0 3****AIM**

To achieve an overall and general understanding of behaviour of structural elements. At this stage students shall be exposed to bending of beams and behaviour of columns.

**OBJECTIVE**

- The student would learn how to work out shear force and bending moment on beams subjected to different loading conditions.
- The student would understand shear stress and bending stress distribution in bending sections.
- They would learn to find slope and deflection of beams.
- They learn behavior of long and short columns and Euler's and Rankine's formula.
- They learn the behaviour of continuous beams, fixed beams and portal frames.

**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**

Theory of simple bending -bending stresses in beams, shear stresses in beams - examples on simple sections.

Stress distribution diagrams.

**UNIT – III DEFLECTION OF BEAMS****9**

Slope and deflection at a section - Double Integration and Macaulay's method for simply supported and cantilever beams for concentrated loads and uniformly distributed loads.

## **UNIT – IV    THEORY OF COLUMNS**

**9**

Short and long columns - Euler's method and its limitations - Derivations of Euler's formula (for different end conditions) – Rankine's formula for columns (No derivations) – Application to simple problems.

## **UNIT – V    INTRODUCTION TO INDETERMINATE STRUCTURES**

**9**

Concept in Analysis of continuous beams, fixed beams, and partial frames - Application to simple problems.

**Total : 45**

### **TEXT BOOKS**

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

### **REFERENCES**

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

**AIM**

To inform the development of architecture in Europe from the Romanesque period to the Renaissance period, (6<sup>th</sup> - 16<sup>th</sup> Century AD) to know the impact of various geographical, cultural, social, religious and political forces, to know the material and construction techniques, adopted through study of select examples.

**OBJECTIVE**

- To enable the student to understand how religious and civic buildings were constructed with Grammar through drawings of select buildings.
- To enable the student to understand as to how, in the gothic period in France structure and Aesthetics were synthesized by study of select buildings.
- To enable the student to understand the architectural character of buildings with plans, elevations and sections of select buildings.
- To study how social and cultural influences contributed to Renaissance architecture in Italy through select examples.
- To study the philosophy of renaissance architects of France and England, as to how they designed world renowned buildings.

**UNIT – I ROMANESQUE****9**

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

**UNIT – II FRENCH GOTHIC****5**

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

**UNIT – III ENGLISH AND ITALIAN GOTHIC****7**

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**

**12**

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 Architectural character 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;

Brunelleschi – Dome of Florence cathedral, founding hospital, Florence, Pazzi chapel, S.Croce, Florence,

Michelangelo – St.Peters, Rome, Campidoglio Capitoline Hill, Rome,

Andrea Palladio - .Villa Godi, Villa Pisani

## **UNIT – V FRENCH & ENGLISH RENAISSANCE**

**12**

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 – st paul’s cathdal, library at trinity college, Chelsea hospital.

Indigo Jones – Queen house at Greenwich London, banqueting house at white hall

**Total :45**

### **TEXT BOOKS**

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

### **REFERENCES**

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

### **WEBSITES**

<http://www.clr.tornoto.edu> - virtual lib.

<http://www.lib.virginia.edu/>- Renaissance and baroque

<http://2.sis.umich.edu/> - Image browser

**AIM**

To advance the basic knowledge already provided and extend it to application in buildings through understanding of spatial organization, relationship, principles of composition so as to provide a knowledge which would influence process of design.

**OBJECTIVE**

- To make student understand the interaction that happens between form and spaces resulting in definite relationships, and the way various forms of organization influence the concept of design.
- To make student understand the distinction between character and style in building as it reflected in various civilizations of the world.
- To provide information on various principles of aesthetic that influenced traditional architecture through study of examples.
- To make student understand how movement and circulation is enhanced in and around buildings through appropriate examples.
- To enable students to realize as to how architects of internal fame have successfully applied these knowledge base in their projects.

**UNIT – I ORGANISATION OF FORMS & SPACES 8**

- a) Spatial Relationships: i) Space within space, ii) Interlocking spaces, iii) Adjacent spaces, iv) Space linked by a common space.
- b) Spatial Organization: influencing factors and their types i) Centralized, ii) Linear, iii) Radial, iv) Clustered, v) Grid

Works of contemporary architects and their ideologies and philosophies using the forms and space – F.L.Wright, Le Corbusier

**UNIT – II ARTICULATION 2**

Articulation of Form. Types: i) Edges and corners, ii) Surfaces articulation Works of contemporary architects and their ideologies and philosophies using the forms and space – Louis Sullivan, Philip Johnson

**UNIT – III CIRCULATION 5**

Function of building circulation components of building circulation - The building approach, The building entrance, configuration of the path, path space relationship, form of circulation space with examples. Simple circulation diagram for buildings. Examples - Circulation as a component in the works of modern and post modern architects – Louis Khan, Charles Correa, and Michael Graves.

**UNIT – IV PRINCIPLES OF COMPOSITION****5**

Unity, harmony and specific qualities of design to include dominance, punctuating effect, dramatic effect, fluidity, climax, accentuation and contrast with building examples.

**UNIT – V APPLICATION OF COLOUR IN ARCHITECTURE****5**

Effect of colour in Architecture - Colour symbolism

**Total : 30****TEXT BOOKS**

1. Paul Alan Johnson - The Theory of Architecture - Concepts and Themes - Van Nostrand Reinhold Co - 1994.
2. Francis D.K.Ching, Architecture - Form, Space and Order, Van Nostrand Publications, New York, 1979.
3. V.S. Pramar, Design Fundamental in Architecture - Somaiya Publications Pvt. Ltd. New Delhi, 1973.

**REFERENCES**

1. Ernest Burden - Elements of Architectural Design - A visual resource, Van Nostrand Reinhold, 1994.
2. Sir Bannister Fletcher - A History of Architecture, Butterworths, London, 1987.

**AIM**

To introduce the technology of computer system, operation principles, use of other related hardwares, with a thrust on 2D Drafting as a necessity for architects. Coverage will be on drawing objects, fitting, setting, size and dimensioning, with a thrust on advanced 2D Drafting techniques involving complex building drawings.

**OBJECTIVES:**

- To inform the student, basic understanding of components, operation system, (WINDOWS) application software and other accessories.
- To make a student understand basic tools of ACAD i.e. formatting (limits, units, etc) drawing tools or drafting, modification of the same.
- A knowledge on understanding of advanced tools such as layers, line type, etc. 2D drafting of building drawings.

**UNIT – I INTRODUCTION 10**

Introduction to personal computers- hardware/software-operating system-important DOS commands- windows basics introduction to CAD packages.

**UNIT – II DRAWING CONSTRUCTION TECHNIQUES 12**

Setting up & controlling AutoCAD drawing, environment- Creating & Editing commands.

**UNIT – III TECHNIQUES FOR ENHANCING PRODUCTIVITY 10**

Organizing a drawing with layers-Advanced geometry editing- creative & using blocks- Inquiry Tools- AutoCAD Design center.

**UNIT – IV DRAWING EMBELLISHMENTS 10**

Text annotation- creating & Customizing Hatch patterns- productive dimensioning- defining text & dimension styles

**UNIT – V DRAWING OUTPUT 10**

Introduction to related packages- 3Dmax, Archicad, etc. Printing and plotting- creating slide presentation-drawing utilities-importing/exporting files.

**Total :60**

**TEXT BOOKS:**

1. Sham Tickoo, Advance Technique in AutoCAD Re.14 - 1997.

**REFERENCES:**

1. V.Rajaraman, Principles of Computer Programming - Prentice Hall of India.
2. Byron S.Gottfried, Theory and problems of programming with C.Schaum's outline series, McGraw-Hill Publishing Co.
3. AutoCAD reference manual - Autodesk UNC, 1998.
4. AutoCAD architectural users guide - Autodesk Inc., 1998.
5. Sham Tickko, Understanding AutoCAD - 14 (Windows) - 1997.

**WEBSITES:**

1. [http://www.sln.fi.edu/-Computer drafting](http://www.sln.fi.edu/-Computer%20drafting)
2. <http://www.ccollege.hccs.cc.tx.us/-Comp.graphic>

**AIM**

To introduce knowledge on how cement, concrete and reinforcements are used in various components of buildings like foundations, columns, beams, slabs and staircases. The input is provided as theoretical knowledge base and practical applications in the form of construction drawings as included in objective below.

**OBJECTIVE**

- To provide basic theoretical knowledge on cement, their types, properties and application to buildings.
- To expose the students on theoretical knowledge on preparation of concrete, grading of the same, need for and types of reinforcement and applications at the site.
- To enable the students to understand application of concrete in foundations, floors, walls, columns, beams and slabs through theory and practical knowledge through scaled construction drawings.

To provide adequate theoretical exposure on various factors involved in staircase design, their types, structural supports required and finishing details. Practical knowledge on types, foundations, fixing and finishing details will be through scaled construction drawings.

**UNIT – I FERROUS METALS****8**

Brief note on manufacture, study of properties and uses of cast iron, wrought iron, pigiron 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 STEEL CONSTRUCTION****28**

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.

Steel staircases and handrails, balusters - Doors and windows - openable, sliding - collapsible gates - rolling shutters.

Steel in furniture and other interior uses. Detailing and specification for physically handicapped

## UNIT – III NON FERROUS METALS

8

Aluminum and Aluminum Alloys - brief study on properties and uses - Aluminum 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 – IV CONSTRUCTION USING NON-FERROUS METALS

25

Aluminum doors - openable, sliding, pivoted. Aluminum windows and ventilators - openable, sliding, pivoted, top hung, bottom hung, louvered and fixed. Aluminum partitions, false ceiling, shop front handrails, curtain walling. Aluminum roofing - northlight glazing bar, aluminum roofing sheets. Use of other nonferrous metals like copper, bronze, brass, etc. in architectural construction. Detailing and specification for physically handicapped.

## UNIT – V GLASS

6

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. Detailing for physically handicapped.

**Total : 75**

### TEXT BOOKS

1. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India,1997.
2. W.B.Mckay Building Construction, Longmans, U.K. 1981.

### REFERENCES

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

### WEBSITES

<http://www.britmetfed.org.uk/frmedu.html>  
<http://www.indiabusinessonline.com>  
<http://www.nrwas.com>  
<http://www.arcadiaproducts.com>  
<http://www.sail.com.in>

**AIM**

To create an awareness that architecture, to a large extent, gets influenced by climate through exposing the student to factors of climate, the various zones, heat flow through materials and buildings, the resultant ambience and finally leading to design considerations.

**OBJECTIVE**

- To provide information on factors that contributes to climate and comfort zone.
- To enable student understand the movement of sun in various parts of the globe, its paths, angles, the radiation levels and methods to overcome the harmful effects through shading devices.
- To make student understand the transfer of heat into buildings through materials, and building elements.
- To expose student to air movements into and around buildings and to various effects.
- To provide information on various design considerations and parameters that are required for various climatic zones and integration of landscape building designs.

**UNIT - I CLIMATE AND THERMAL SENSATION 12**

Factors that determine climate - Components of climate - Characteristics of climate types, Building design Approaches- Body heat balance - Effective temperature - Comfort zone. Exercises on Mahoney chart, Comfort zone calculation, etc.,

**UNIT - II SOLAR CONTROL 12**

Solar geometry - Solar chart - Sun angles and shadow angles. Design of solar shading devices.- Study projects, Shading device study models, etc.,

**UNIT - III HEAT FLOW THROUGH BUILDING MATERIALS 8**

Basic principles of Heat Transfer, Performance and properties of different materials- calculation of 'U' value - Time lag and decrement of building elements- Study projects

**UNIT - IV AIR MOVEMENT 12**

Wind rose - Wind shadows - Air movement around and through buildings - Stack effect - Thermally induced Air currents.

## UNIT - V SHELTER DESIGN IN TROPICS

16

Design considerations for warm humid, hot dry, composite and upland climates, Heavy rainfall regions. Landscape and climatic design. Mini projects in relation with Architectural Design

**Total :60**

### 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.

### WEBSITES:

<http://www.envinst.conu.edu/~envinst/research/built.html>  
[www.terin.org/](http://www.terin.org/)  
[http://www.pge.com/pec/archives/w98\\_passi.html](http://www.pge.com/pec/archives/w98_passi.html)  
<http://solstice.crest.org/efficiency/index.shtml>

**AIM**

To train the student into the process of design approach, glorify spaces in respect of buildings of small scale, small span, horizontal and vertical movements (two or three levels), incorporating barrier free elements and details. Students are to be given exposure in computer usage.

**OBJECTIVE**

- To enable the student to familiarize with the given design topic by choosing, relevant and appropriate case studies within the region visiting the sites and analyzing the same.
- To expose students to familiarize with the given topic of design by arranging special lectures from architects.
- To expose him/her to knowledge available on the relevant design at international level, through books and websites.

**UNIT – I 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, etc.

**Total : 180**

**TEXT BOOKS:**

1. Ed.by. Quentin Pickard RIBA - The Architects' Hand Book - Blackwell Science Ltd. - 2002.
2. De Chiara and Callender, Time Saver Standards Building Types, McGraw-Hill Co., 2nd Edition, 1980.

## **REFERENCES:**

1. Edward D.Mills, Planning - The Architects Handbook - 10th Edition, British Library C Tologuing in Publication Data, 1985.
2. P&D Act 1995.
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/>

**AIM**

To sensitize students on timber and steel structures. At this stage they would be exposed to the design of timber joists to riveted and welded joints and steel beams and columns.

**OBJECTIVE**

- The student would learn design of timber joists.
- They would understand analysis and design of riveted joints.
- They would learn design of fillet-welded joints.
- They would know designing of laterally supported steel beams.
- They would understand design of columns.

**UNIT – I TIMBER****5**

Design requirements from National Building Code, Design of timber joists.

**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 & BOITED JOINTS****10**

Types of welding, permissible stresses, Design of fillet welds (excluding eccentric connections) Design of Boited connection

**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 built – up columns lacing, battening and other connections).

**TOTAL : 45****TEXT BOOKS:**

1. Ramachandra S., Design of Steel Structures, Standard Book House, Delhi, 1984.
2. A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.

**REFERENCES:**

1. National Building Code of India, 1983, Part VI, Structural Design.
2. Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
3. Negi “Design of steel Structures”, Tata McGraw-Hill Book Company, New Delhi 1997.

## **XAR402 - HISTORY OF ARCHITECTURE IV**

**2 1 0 3**

### **AIM**

To inform about the influence of Islamic Architecture in Indian architecture, in terms of elements, new typologies, various styles, and new construction techniques through chronological study of select examples under the patronage of the different rulers.

### **OBJECTIVE**

- To enable the students to understand the emergence of Islamic Architecture, the need for newer topologies of buildings and to know how style is unique in terms of elements, decoration and colour.
- The students would learn the new typological structure in terms of their form and function, the underlying geometry and concepts of decoration and colour.
- The students are exposed to various climatic, religious influences and how various styles could be identified.
- To enable the students to understand Delhi or Imperial style in Islamic architecture through selected buildings by studying and drawings.
- To enable the students to understand the characteristic feature of provincial style through select buildings through study and drawings. Also the students would be exposed to various rulers who contributed to Islamic architecture and landscape design.

### **UNIT – I INTRODUCTION TO ISLAMIC ARCHITECTURE**

**10**

Brief History of Islam in terms of birth, spread across countries and principles – factors Influencing Islamic Architecture - Evolution of building types in terms of forms and functions - the mosque, the tomb, and minaret, the madarasa, the palace, the caravanserai, vernacular architecture, the market – important principles, elements and character of Islamic architecture in terms of structural materials and methods of construction, elements of decoration, color, geometry, light.

### **UNIT – II ISLAMIC ARCHITECTURE IN INDIA**

**4**

Advent of Islam into the Indian subcontinent and its impact - sources of Islamic Architecture in India and influences on them - Brief history of development and classification under different styles and regions.

### **UNIT – III DELHI OR IMPERIAL STYLE**

**8**

Development of architectural style during the rule of the slave, Khalji – Qutb Minar, Alai dar waza, Iltumish tomb, Tuqlaq, Sayyid and Lodhi Dynasties - important tombs.

### **UNIT – IV PROVINCIAL STYLE**

**12**

Development of the provincial styles in different regions

Punjab – remains of timber construction in Multan and Lahore and tombs.

Jaunpur- Atala masjid,

Bengal- Adina masjid, Gujarat – Ahmedabad jami masjid, Tin darwaza, Sidi sayed mosque, Champaner Malwa, the Deccan (Bijapur – Gol Gumbaz, Golconda, Bidar and Gulbarga – Jami Masjid) -

### **UNIT – V CONTRIBUTION OF RULERS OF ISLAMIC INDIA**

**11**

Development of the Mughal style under the different rulers - Babur, Shershah,

Humayun – humayun tomb,

Akbar – Agra fort, Fatehpur sikri,

Jahangir- Akbar Mausoleum, Jahangir Mausoleum, Shalimar garden,

Shahjahan – Delhi fort, Jami Masjid Delhi, Taj Mahal,

Aurangazeb - Badshahi Mosque.

Development of the Mughal gardens.

**Total :45**

#### **TEXT BOOKS:**

1. Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons, Bombay, 1983.

#### **REFERENCES:**

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

## WEBSITES

<http://www.islamicart.com/pages/archcrea/index.htm>  
<http://libraries.mit.edu/rvc/aka/agakhan/index.html>  
<http://www.greatbuildings.com/types/styles/islamic.html>  
<http://www.etsuidaho.edu/arch499/nonwest/Islam1.html>  
<http://indiagateway.com/culture/architecture.html>

**AIM**

To sensitise students that efficiency of building function also depend on integration of services like sewage disposal system, water supply systems, identification of sources, segregation, treatment, augmentation, distribution, the important equipments and gadgete involved, their installation and maintenance.

**OBJECTIVE**

- To make students understand theoretically fundamentals of sewage treatment, their collection and disposal at campus level and construction system involved in services.
- To make students understand other city level disposal collection, conveyance, recycling, and storm water drains and dispersals.
- To make students understand the importance of water quality, its purification treatments at city level and distribution in small towns and at individual building level.
- To enable student to have knowledge on rainwater harvesting, management, and how to recycle other wastewater from the buildings and at city levels.
- To provide the knowledge on the various equipments like pumps, their types, selection, installation and importance of maintenance as available in the Indian market.

**UNIT – I WATER QUALITY, PURIFICATION AND TREATMENT****9**

Surface and ground water sources - quality/quantity - nature of impurities - treatments - water supply systems - sedimentation - water supply project. Sand filtration - sand filters - rapid sand filters - pressure filters - sterilization and disinfection.

**UNIT – II WATER DISTRIBUTION SYSTEMS****9**

Distribution systems in small towns - Types of pipes used - Laying, jointing, testing - prevention of water wastage and reuse of water.

Pluming-Internal water supply in buildings

Municipal byelaws and regulations.

## **UNIT–III SEWAGE TREATMENT AND SEWERAGE SYSTEMS**

**12**

Sanitation in buildings. Primary and secondary treatment Activated sludge process Intermittent and trickling sand filters .

Arrangement of sewerage systems in Housing, large factories, towns and cities - sewage pumping station - Rainwater disposal and storm water drainage from buildings.

Collection, conveyance and disposal of town refuse systems

Materials and construction details of sewers and connections - plumbing system for building types. Details of Kitchen, bath, toilet and Individual units- One pipe system, Two pipe system- Various types of traps.

## **UNIT – IV STORM AND RAIN WATER MANAGEMENT**

**9**

Rainwater disposal and storm water drainage from buildings. Collection, conveyance and disposal of town refuse systems

## **UNIT – V PUMPS AND MOTORS, SANITARY FIXTURES AND FITTING**

**6**

Pumps including reciprocating, centrifugal, deep well, submersible, sewage pumps and their selection and choice installation, Maintenance

**Total : 45**

### **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, 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.

## **XAR404 - ENVIRONMENTAL SCIENCES**

**2 1 0 3**

### **UNIT – I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES**

**2**

Definition, Scope and importance - Need for public awareness.

### **UNIT – II RENEWABLE AND NON-RENEWABLE RESOURCES**

**8**

Natural resources and associated problems - Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal peoples. - Water resources: Use and over-utilization of surface and ground water, dams-benefits and problems. - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies. - Land resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources. - Equitable use of resources for sustainable lifestyles.

### **UNIT – III ECOSYSTEMS**

**6**

Concept of ecosystem. - Structure and function of an ecosystem. - Procedures, consumers and decomposers. - Energy flow in the ecosystem. - Ecological succession. - Food chains, food webs and ecological pyramids.- Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem - Grassland ecosystem - Desert ecosystem - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

### **UNIT – IV BIODIVERSITY AND ITS CONSERVATION**

**8**

Introduction - Definition: Genetic, species and ecosystem diversity. - Biogeographical classification of India. - Value of biodiversity: Consumptive use, productive use, social, ethical, and aesthetic and option values. - Biodiversity at global, National and local levels. - India as a mega-diversity nation. - Hot spots of biodiversity. - Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India. - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

## **UNIT – V ENVIRONMENTAL POLLUTION**

**8**

Definition - Causes, effects and control measures of: - Air pollution - Water pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution - Nuclear Pollution - Soil waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: Floods, earthquake, cyclone and landslides.

## **UNIT – VI SOCIAL ISSUES AND THE ENVIRONMENT**

**7**

From unsustainable to sustainable development. - Urban problems related to energy.

Water conservation, rain water harvesting, watershed management. - Resettlement and re habitation of people; its problem and concerns. Case studies. - Environmental ethics: - Issues and possible solutions. - Climate changes, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. - Wasteland reclamation. - Consumerism and waste products. - Environmental protection Act. - Air (prevention and control of Pollution) Act. - Water (prevention and control of Pollution) Act. - Wildlife protection Act. - Forest conservation Act. - Issues involved in enforcement of - environmental legislation. - Public awareness.

## **UNIT – VII HUMAN POPULATION AND THE ENVIRONMENT**

**6**

Population growth, variation among nations. - Population explosion - Family Welfare - Programme. - Environment and human health. - Human rights. - Value education. - HIV/AIDS - Women and Child Welfare. - Role of information Technology in - Environment and human health. - Case studies.

## **UNIT – VIII FIELD WORK**

Visit to a local area to document environmental asserts-river/ forest/ grassland/ hill/ mountain. - Visit to a local polluted site - Urban/ Rural/ Industrial/ Agricultural. Study of common plants, insects, birds. - Study of simple ecosystem-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours).

**TOTAL : 45**

### **TEXT BOOKS:**

1. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
2. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.

## REFERENCES

1. Hawkins.R.E, Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R).
2. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assesment. Cambridge Univ. Press 1140p.
3. McKinney, M.L & Schoch, R.M. 1996. Environmental Science System & Solutions, Web enhanced edition. 639p.
4. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).

**AIM**

To introduce knowledge on how cement, concrete and reinforcements are used in various components of buildings like foundations, columns, beams, slabs and staircases. Thrust will be also on use of glass, treatment processes, properties and applications in building industry in buildings. The input is provided as theoretical knowledge base and practical applications in the form of construction drawings as included in objective below.

**OBJECTIVE**

- To provide basic theoretical knowledge on cement, and Glass, their types, properties and application to buildings.
- To expose the students on theoretical knowledge on preparation of concrete, grading of the same, need for and types of reinforcement and applications at the site.
- To enable the students to understand application of concrete in foundations, floors, walls, columns, beams and slabs through theory and practical knowledge through scaled construction drawings.
- To provide adequate theoretical exposure on various factors involved in staircase design, their types, structural supports required and finishing details. Practical knowledge on types, foundations, fixing and finishing details will be through scaled construction drawings.
- To provide basic theoretical knowledge on composition of glass, idea about manufacture their types.

**UNIT – I CEMENT****8**

Varieties of cement, composition, properties and uses - tests for cement - mortar for various works.

**UNIT – II CONCRETE, IT'S INGREDIENTS AND PROPERTIES****17**

Ingredients - suitability requirements for aggregates, grading of aggregates – water mix in concrete - reinforcement - admixtures - properties of concrete. Concreting process its properties - mix proportioning - batching, mixing, transporting, placing, compaction, curing, formwork - quality control - tests for concrete - joints in concrete - concrete finishes.

## **UNIT – III CONCRETE CONSTRUCTION**

**30**

Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap Concrete floors (PCC), walls and partitions. Concrete lintels, sunshades. Concrete beams and columns and slabs – one-way and two-way slabs.

## **UNIT – IV CONCRETE STAIRCASES**

**20**

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

**Total : 75**

### **TEXT BOOKS:**

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

### **REFERENCES:**

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

**AIM**

To introduce to tools of productivity, concept of object linking and editing session, with a thrust on 3D drafting and 3D rendering as a necessity for architects. Coverage shall be on construction planes, 3D surfaces, use of dynamic projections, techniques of setting to create photo realistic pictures. It is also proposed to cover environment setting and image filing as an additional presentation technique.

**OBJECTIVE:**

- To enable the student understand basic interface and editing necessary for creating 3D objects.
- To enable the student an understanding of tools for creating 3D objects and understanding of modification tools for the same.
- To enable the student an understanding of finishing and output of the 3D model construction of a 3D model.

**UNIT – I DATA EXCHANGE & UPLOADING AutoCAD 5**

Attributes- understanding object linking and embedding-importing objects into AutoCAD using OLE working with OLE objects.

**UNIT – II 3-D MODELLING – I 20**

Understanding 3D coordinate system – using view ports- 3D drawing & Editing Commands- Interactive Viewing in 3D.

**UNIT – III 3-D MODELLING – II 20**

Surfacing in 3D, working with advance surfacing commands- solid modeling- Advance solid modeling commands- editing Solids

**UNIT – IV ADVANCE RENDERING & IMAGE EDITING 10**

Introduction to rendering in 3D-Rendering process-Enhancing digital images from CAD applications using Adobe Photoshop, Paint shop pro & other graphic programs.

**UNIT – V CUSTOMIZING AutoCAD 5**

Creating command aliases- customizing AutoCAD toolbars- Adding a command to the cursor menu introduction to Auto LISP

**Total : 60**

**TEXT BOOKS:**

1. Sham Tickoo, Advance Technique in AutoCAD Re.14 - 1997.

**REFERENCES:**

1. V.Rajaraman, Principles of Computer Programming - Prentice Hall of India.
2. Byron S.Gottfried, Theory and problems of programming with C.Schaum's outline series, McGraw-Hill Publishing Co.
3. AutoCAD reference manual - Autodesk UNC, 1998.
4. AutoCAD architectural users guide - Autodesk Inc., 1998.
5. Sham Tickko, Understanding AutoCAD - 14 (Windows) - 1997.

**WEBSITES:**

1. [http://www.sln.fi.edu/-Computer drafting](http://www.sln.fi.edu/-Computer%20drafting)
2. <http://www.ccollege.hccs.cc.tx.us/-Comp.graphic>

**AIM**

To graduate the student into the process of design in different context (Urban and Rural) by choosing relevant topics of community or civic importance. To understand and document the various factors influencing the rural form and settlements. Exposure to Computer usage is to be given importance.

**OBJECTIVE**

- To enable students to familiarize with given topic of design by choosing appropriate case studies through visits and documentation.
- To educate the students on Rural construction technology materials and infrastructure, life style Economy and other social issues.
- To give additional input on the topic of design by organizing special lectures from expert architect.
- To enable students understand the knowledge available at international level through books, literatures and websites.

**UNIT – I DESIGN STUDIO****70**

Problem related to multi room, single use, small span - multiple story, Horizontal and vertical movement, Active cum passive energy, conventional and frame type buildings.

**Examples:** Department store, Library, higher secondary school, campus students center, etc. The projects will consciously provide for movement and use by the physically handicapped and elderly.

**UNIT – II DESIGN STUDIO - RURAL PROJECT****110**

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

**Total : 180****TEXT BOOKS**

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

**REFERENCES**

1. De Chiara and Callender, Time Saver Standard for Building Types, McGraw-Hill Co., 2nd Edition, 1980.
2. P&D Act 1995.
3. Edward D.Mills, Planning - The Architects Handbook - 10th Edition, British Library Cataloguing in Publication Data, 1985.
4. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw-Hill Book Co., 1982.
5. 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.ddimagazine.com/>

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

## **XAR408 WORKSHOP ON CONSTRUCTION**

**10 days 3**

Intensive training on Marking, Mortar making , Masonry , Arches , Vaults and Domes.