

ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

REGULATIONS 2013

I & II SEMESTER CURRICULUM

B.Arch

SEMESTER I

THEORY					
Course Code	Course Title	L	T	P	C
MA6153	Mathematics	3	0	0	3
AR6101	History of Architecture and Culture - I	3	0	0	3
AR6102	Theory of Architecture - I	3	0	0	3
AR6103	Building Materials - I	3	0	0	3

PRACTICAL					
Course Code	Course Title	L	T	P	C
AR6111	Architectural Drawing - I	0	0	5	3
AR6112	Art Studio	0	0	5	3
AR6113	Basic Design	0	0	12	6
TOTAL		12	0	22	24

SEMESTER II

THEORY					
Course Code	Course Title	L	T	P	C
AR6201	Mechanics of Structures - I	3	0	0	3
AR6202	History of Architecture and Culture - II	3	0	0	3
AR6203	Theory of Architecture - II	3	0	0	3
AR6204	Building Materials - II	3	0	0	3

PRACTICAL					
Course Code	Course Title	L	T	P	C
AR6211	Building Construction - I	0	0	5	3
AR6212	Architectural Drawing - II	0	0	5	3
AR6213	Architectural Design - I	0	0	12	6
TOTAL		12	0	22	24

I & II SEMESTERS SYLLABI

B. ARCH

MA6153

MATHEMATICS

L T P/S C
3 0 0 3

OBJECTIVES

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

UNIT I TRIGONOMETRY AND MENSURATION 9

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

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY 9

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

UNIT III INTEGRATION AND FUNCTIONS OF TWO VARIABLES 9

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

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 9

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

UNIT V BASIC STATISTICS AND PROBABILITY 9

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

TOTAL: 45 PERIODS

TEXT BOOK:

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

REFERENCES:

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

OBJECTIVES :

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

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**7**

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, Gizeh – Temple of Ammon Ra, Karnak – Temple of Abu Simbel (Rock Cut)

UNIT III ANCIENT RIVER VALLEY CIVILIZATIONS: MESOPOTAMIA**8**

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, Uramu – Palace of Sargon, Khorsabad – Palace at Persepolis

UNIT IV CLASSICAL PERIOD: GREECE**12**

Landscape and culture 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, theaters, bouletrion and stadias – Greek temple: evolution and classification – Parthenon and Erektion – orders in architecture: Doric, Ionic, Corinthian – optical illusions in architecture.

UNIT V CLASSICAL PERIOD: ROME**12**

Roman history: Republic and Empire – Roman 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: Colosseum, Circus Maximus, Thermae of Caracalla.

TOTAL : 45 PERIODS**REQUIRED READINGS**

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

REFERENCES

1. Pier Luigi Nervi, General Editor – History of World Architecture – Series, Harry N. Abrams, Inc. Pub., New York, 1972.
2. Lloyd S. and Muller H.W., History of World Architecture – Series, Faber and Faber Ltd., London, 1986.
3. Gosta, E. Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
4. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962.
5. Vincent Scully: Architecture; Architecture – The Natural and the Man Made : Harper Collins Pub: 1991.

AR6102

THEORY OF ARCHITECTURE - I

L T P/S C

3 0 0 3

OBJECTIVES :

- To introduce the various facets of architecture and its influencing factors.
- To introduce the formal vocabulary of architecture as one of the ways to experience the built environment.
- To understand and appreciate the universals of architectural form and space in terms of elements and principles within particular historical, cultural and geographic contexts.

UNIT I INTRODUCTION TO ARCHITECTURE

8

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 – Introduction to the formal vocabulary of architecture and Gestalt ideas of visual perception.

UNIT II ELEMENTS OF ARCHITECTURE

7

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.

UNIT III ELEMENTS OF ARCHITECTURE – FORM

9

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 IV ELEMENTS OF ARCHITECTURE – SPACE

9

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 V PRINCIPLES OF ARCHITECTURE

12

Understanding fundamental principles such as proportion, scale, balance, symmetry/asymmetry, rhythm, axis, hierarchy, datum, unity, harmony, dominance, climax – Movement with reference to the architectural form and space – detailed study of relationship between architectural form and circulation – Types of circulation – Building approach and entrance, path configuration and form, path space relationship, orientation.

TOTAL : 45 PERIODS

REQUIRED READINGS:

1. Francis D.K. Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, Analysing Architecture, Routledge, London, 2003.
3. Pramod V.S., Design Fundamentals in Architecture, Somaiya Publications Private Ltd., New Delhi, 1973.
4. Yatin Pandya, Elements of Space making, Mapin 2007.

REFERENCES:

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

AR6103**BUILDING MATERIALS - I****L T P/S C****3 0 0 3****OBJECTIVES:**

- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as soil, lime, rocks and stones.
- To inform the properties, characteristics and use of bamboo, palm, straw, etc. and methods of preservation and treatment.
- To sensitize the students to the use of these naturally occurring materials in the context of creating a green architecture.

UNIT I SOILS**9**

Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Characteristics of core, Types of Stabilizers, Requirements and Types of mudwall building and surface protection.

UNIT II LIME**8**

Types of lime, Classification of lime, comparison between fat lime and hydraulic lime, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty, Precautions in handling and uses of lime.

UNIT III BAMBOO AND OTHER MATERIALS**10**

Bamboo – Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo.

Cane, gate, coir, coconut - Growth, Form, Shape, Leaves, Flowering, Propagation Roofing materials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.

UNIT IV STRAW BALES 6
Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof. Plastering straw bale walls, straw bale roof.

UNIT V ROCKS AND STONES 12
Classification of rocks, Sources, Seasoning, Quarrying of stones, Dressing, Characteristics of stones, Testing of stones, Common building stones and their uses. Masonary and paving. Stone veneering, preservation of stones Deterioration of stones, Durability, Preservation, Selection of stones, Artificial stones.

TOTAL: 45 PERIODS

REQUIRED READINGS:

1. Varghese P.C., Building Materials, Prentice Hall of India put Ltd New Delhi 110001, 2005.
2. Dunkelberg (K), Bambus – Bamboo, Bamboo as a Building Material, Karl Kramer Verlag Stuttgart, 2000.
3. Building with straw - Design and Technology of a Sustainable Architecture Gernot Minke and Friedemann Mahlke Birkhauser – Publisher for Architecture Berlin – Bostan, 2005.

REFERENCES:

1. Duggal S.K., Building materials, Oxford and IBH publishing Co, put, Ltd, New Delhi 110001, 1997.
2. Spencke R. F. and Cook D.J. Building Materials in Developing Countries – John Wiley and sons 1983.

AR6111 ARCHITECTURAL DRAWING - I LT P/S C
0 0 5 3

OBJECTIVES

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

UNIT I GEOMETRICAL DRAWING: INTRODUCTION 15
Introduction to fundamentals of drawing/ drafting: Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, etc.; Construction of angles, use of scales;
Construction of circles, tangents, curves and conic sections.

UNIT II GEOMETRICAL DRAWING: PLANE GEOMETRY 20
Construction and development of planar surface – square, rectangle, polygon etc
Introduction of multi- view projection – projection of points, lines and planes.

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY 10
Multi- view projection of solids – cube, prism, pyramids, cones, cylinders etc.; Sections of solids, true shape of solids.

UNIT IV GEOMETRICAL DRAWING: AXONOMETRIC PROJECTION 10
Isometric, plan oblique and elevation oblique projection of planes, solids and combination of solid etc.

UNIT V MEASURED DRAWING 20
Isometric, plan oblique and elevation oblique projection of planes, solids and combination of solid etc.

TOTAL : 75 PERIODS

REQUIRED READINGS

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

REFERENCES:

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

AR6112 ART STUDIO L T P/S C
0 0 5 3

OBJECTIVES:

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

UNIT I DRAWING 24

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

UNIT II PAINTING I 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 15

Indoor and out door painting – Rendering techniques Exercise involving Water colour – Water soluble colour pencil – Tempra – Acarali – 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: 75 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.

AR6113

BASIC DESIGN

**L T P/S C
0 0 12 6**

OBJECTIVES:

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

Contents:

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 in Architectural Design through the manipulation of line, plane, solid and voids and application of texture colour, proportion etc.

TOTAL: 180 PERIODS

REQUIRED READINGS:

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

AR6201

MECHANICS OF STRUCTURES - I

L T P/S C
3 0 0 3

OBJECTIVES:

- To enable a student to understand the effect of action of forces on a body and the concept of equilibrium of the body through exercises.
- To determine the internal forces induced in truss members due to external loads by working out problems.
- To calculate the sectional properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems.
- To study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through select problems.
- To derive the relationship between elastic constants and solving problems.

UNIT I	FORCES AND STRUCTURAL SYSTEMS	8
Types of force systems - Resultant of forces-Lami's theorem- principle of moments varignon's theorem - principle of equilibrium (no reaction problems) - simple problems		
UNIT II	ANALYSIS OF PLANE TRUSSES	10
Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints.		
UNIT III	PROPERTIES OF SECTION	10
Centroid- Moment of Inertia - Section modules – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis –simple problems.		
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. (excluding composite bar)		
UNIT V	ELASTIC CONSTANTS	7
Elastic constants - Relation between elastic constants - Application to problems.		
		TOTAL: 45 PERIODS

REQUIRED READINGS

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

REFERENCES:

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

AR6202	HISTORY OF ARCHITECTURE AND CULTURE - II	L T P/S C
		3 0 0 3

OBJECTIVES:

- To understand Indian architecture as evolving within specific cultural contexts including aspects of society, religion, 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.

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 forms of bamboo and wooden construction - origins of Buddhism and Jainism.		

UNIT II	BUDDHIST ARCHITECTURE	10
Evolution of Buddhism, Buddhist thought, art and culture - Hinayana and Mahayana Buddhism - interaction of Hellenic & 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 Ashokan Pillar, Sarnath - rock cut caves at Barabar - Sanchi Stupa- rock cut architecture in Ajanta and Ellora - Karli - viharas at Nasik - Rani gumpha, Udaigiri - Takti Bahai, Gandhara.		

UNIT I	MEANING IN ARCHITECTURE	6
Architecture as a vehicle of expressing, symbolism and communication- Illustrative examples		
UNIT II	ARCHITECTURAL CHARACTER	9
Ideas of character, style, architectural movement: Illustrative examples across various periods in history.		
UNIT III	WORKS OF ARCHITECTS	12
Role of individual architects in the generation of architectural form, through study of exemplary works, architectural inspirations, philosophies, ideologies and theories of architects.		
UNIT IV	ANALYZING ARCHITECTURE	9
Introduction to modes of understanding architecture in totality in terms of the various aspects studied before in the subject – understanding how case studies have used representational, analytic and interpretational tools		
UNIT V	EXPERIENCING ARCHITECTURE	9
Understanding architecture in totality in terms of the various aspects studied in this course firsthand experience, analysis and interpretation of building		

TOTAL :45 PERIODS

REQUIRED READING

1. Yatin Pandya, Elements of Space making, Mapin 2007
2. Simon Unwin, Analyzing Architecture, Routledge 2003
3. Francis D.K.Ching, Architecture, Form, Space and Order; III Edition, John Wiley, 2007
4. Leland M.- Roth, Understanding Architecture: Its Elements- History, And Meaning, Icon Editions, 1993
5. Haze J Conway, Rowan Roenisch, Understanding Architecture, Routledge 2005

REFERENCES

1. Anthony Antoniades, Poetics of architecture - Theory of design, Wiley 2008
2. Steen Eiler Rasmussen - Experiencing architecture, MIT Press 1964
3. Peter von Meiss -Elements of architecture - From Form to Place, Span Press 1992
4. Bryan Lawson -How Designers Think, Architectural Press Ltd" London, 1980.
5. Hanno Rauterberg, Talking Architecture, interview with Architects, Preste12008 The A-Z of Modern Architecture-Taschen 2007.

AR6204

BUILDING MATERIALS - II

L T P/S C

3 0 0 3

OBJECTIVES:

- To have an understanding of the properties, characteristics, strength, manufacture, processing and application of 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.

UNIT I BRICKS 10
Classification of bricks including bricks substitutes like fly ash bricks, characteristics, ingredients of bricks – Manufacture of bricks – Forms of bricks – Testing of bricks – Storing – Light weight bricks – Case studies and application. Light weight bricks.

UNIT II CLAY PRODUCTS 12
Manufacture of burnt clay bricks, paving bricks, hollow bricks – terracotta, porcelain, stoneware, earthenware Glazing and their uses – Glazed ceramic tiles, Fully vitrified tiles, Ceramic sanitary appliances, Stoneware pipes and fittings.

Roofing materials - Manufacture of Mangalore tiles, pot tiles, pan tiles – Case studies and application.

UNIT III TIMBER 8
Classification of trees, structure of trees, Defects in timber, Storage of timber, Uses of timber, characteristics, seasoning of timber, Defects and diseases, Decay of timber, Preservation, Fire resistance, Conservation of timber.

UNIT IV TIMBER PRODUCTS 8
Market forms of timber, Industrial timber, - Veneers and Veneer Plywoods, Particle board, Hard board, Fibre board, Block board and Lamin boards, Laminates, advantages and Blockboard uses.

UNIT V PAINTING AND VARNISHING IN TIMBER 7
Composition, characteristics, preparation, Primer, Painting different surfaces. Enamels, Paint, Varnishing – types of varnishing Miscellaneous paints, defects, uses and cost of materials.

TOTAL: 45 PERIODS

REQUIRED READINGS

1. Rangwala S. C., Engineering Materials, Charotar, Publishing House, Anand-388 001, India, 2007.
2. Duggal S.K., Building materials, New Age International, New Delhi, 2009.
3. Reshpande B., Materials and Construction, Oriental Watchman Publishing House, Poona-2.

REFERENCES:

1. Varghese P.C., Building Materials, Prentice Hall of India put Ltd, New Delhi 110001, 2005.
2. Spencke R.J. and Cook S.J., Building materials in developing countries, John Wiley and sons 1983.

AR6211

BUILDING CONSTRUCTION - I

L T P/S C

0 0 5 3

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 10
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 including detailing of arches, walls, door and window openings and understanding of the same through case studies.

UNIT III BAMBOO 13
Design and Construction Techniques using bamboo for building components for small scale buildings like snack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies

UNIT IV STRAW BALES 12
Design Exercises : using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems, Roofing options, plastering, door and window detailing for small scale buildings and understanding of the same through case studies

UNIT V 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 and understanding the same through case studies

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. Francisa D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

AR6212 ARCHITECTURAL DRAWING - II L T P/S C
0 0 5 3

OBJECTIVES:

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

UNIT I SCIOGRAPHY 10
Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.

UNIT II	PERSPECTIVE: SCIENTIFIC METHOD	25
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.		
UNIT III	PERSPECTIVE: SHORT CUT METHOD	15
Introduction to short cut perspective method. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.		
UNIT IV	MEASURED DRAWING: HISTORIC DOCUMENT STUDY	10
Combined study of historic document along with small building by using simple measuring tools like tapes, photograph etc.		
UNIT V	MEASURED DRAWING: DOCUMENTATION	15
Documentation of a complete building of a special interest in terms of history, building construction, architectural excellence or technology.		

TOTAL: 75 PERIODS

REQUIRED READINGS:

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

REFERENCES:

I. 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.

II.PERSPECTIVE

4. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd., Japan, 1967.

III. SCIOGRAPHY

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.

AR6213	ARCHITECTURAL DESIGN - I	L T P/S C
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OBJECTIVES:

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

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

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

Areas of focus/ concern:

- architectural form and space
- aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.,
- function and need: user requirements, anthropometrics, space standards, circulation
- image and symbolism

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

TOTAL: 180 PERIODS

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
5. Ramsey et al, Architectural Graphic Standards, Wiley 2000

REFERENCES:

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