

**COURSE STRUCTURE: FIRST YEAR B.ARCH. PROGRAMME**

<b>1st SEMESTER</b>						
<b>Sl. No.</b>	<b>Sub. Code</b>	<b>Theory</b>	<b>Contact Hrs. (L-T-P)</b>	<b>Credit</b>	<b>Internal Evaluation</b>	<b>University Marks</b>
1	AH113	Applied Mathematics	3-0-0	3	50	100
2	AR123	Environmental Studies	3-0-0	3	50	100
3	AR133	Introduction to Architecture	3-0-0	3	50	100
<b>TOTAL</b>			<b>9</b>	<b>9</b>	<b>450</b>	
<b>Sl. no</b>	<b>Sub. Code</b>	<b>Sessionals</b>	<b>Contact Hrs. (L-T-P)</b>	<b>Credit</b>	<b>Internal Evaluation</b>	
4	AR144	Architectural Graphics-I	0-0-6	4	100	
5	AR153	Architectural workshop	0-0-3	3	100	
6	AR164	Basic Design-I	0-0-6	4	100	
7	AR174	Building Materials and Construction-I	2-0-6	4	100	
8	AH182	Communicative English	1-0-2	2	100	
<b>TOTAL</b>			<b>26</b>	<b>17</b>	<b>500</b>	
<b>Total Credits in the semester</b>				<b>26</b>		
<b>Total Marks in the semester</b>					<b>950</b>	

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IInd SEMESTER						
Sl. No.	Sub. Code	Theory	Contact Hrs. (L-T-P)	Credit	Internal Evaluation	University Marks
1	AS213	Structural Mechanics	3-0-0	3	50	100
2	AR223	Climatology	2-0-1	3	50	100
3	AR333	History of Architecture-I	3-0-0	3	50	100
<b>TOTAL</b>			<b>9</b>	<b>9</b>	<b>450</b>	
Sl. no	Sub. Code	Sessionals	Contact Hrs. (L-T-P)	Credit	Internal Evaluation	
4	AR244	Architectural Graphics-II	0-0-6	4	100	
5	AR252	Visual Documentation and Measured Drawing	0-0-3	2	100	
6	AR264	Basic Design-II	0-0-6	4	100	
7	AR274	Building Materials and Construction-II	2-0-6	4	100	
8	AS283	Surveying techniques	1-0-2	3	100	
<b>TOTAL</b>			<b>26</b>	<b>17</b>	<b>500</b>	
<b>Total Credits in the semester</b>				<b>26</b>		
<b>Total Marks in the semester</b>					<b>950</b>	

## **DETAILED SYLLABUS OF 5 YEAR B.ARCH PROGRAMME**

### **SEMESTER I**

#### **THEORY**

<b>AH113</b>	<b>Applied Mathematics</b>	<b>HR 3-0-0</b>	<b>CR-3</b>
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#### **Objective**

The course is aimed to develop basic mathematical techniques required to support architectural and engineering concepts, and is also oriented to understand and analyse practical engineering problems. The course modules cover statistics and linear programming, which will enable the students to analyse field study data and formulate mathematical models.

#### **Module 1**

##### **GEOMETRY AND MEASUREMENTS**

Proportion, Golden ratio, Euclidean geometry, Methods to calculate areas, surface areas of solids and volumes for various geometrical shapes (types of curves) and volumes (cube, sphere, cone, cylinder)

#### **Module 2**

##### **CALCULUS & APPLICATIONS**

Methods of differentiation. Calculus of one variable

Fundamentals of Integral calculus, Maxima and Minima for a function of one variable, Reduction Formulae, Calculation of areas using integrals: Area bounded by curve – Arc length of curve.

#### **Module 3**

##### **MATRICES & BASICS OF LINEAR PROGRAMMING**

Elementary rows & column transformation, Gauss elimination & solution of System of equations, Inverse matrix.

Formulation of Linear Programming, Graphical solution, Simplex method.

#### **Module 4**

##### **STATISTICS**

Measures of central tendency, Mean/ Median mode, measures of dispersion (Mean deviation/ Standard Deviation, Variance), Co-relation and Regression.

## Module 5

Relevant mathematical topics as decided by the subject faculty

## References

1. Kreyszig, E., Advanced Engineering Mathematics. Hoboken: John Wiley & Sons, 2007.
2. Grewal B.S., Higher Engineering Mathematics, 35th edition, Khanna Publishers, 2000.
3. Kapoor, V. K. and Gupta, S. C., Fundamentals of Mathematical Statistics, Sultan & Sons
4. Kalavathy, S., Operation Research, Vikas Publishing House Pvt. Ltd., 2009
5. [Boucher](#), J. S., 1857, Mensuration, Plane and Solid, Longman, Brown, Green, Longmans and Robert, London.

AR123	Environmental Studies	HR 3-0-0	CR-3
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## Objective

To enable the student to understand the ecosystem, effect of pollution, environmental degradation and eco sustainable development.

## Module 1

### INTRODUCTION TO ECOSYSTEMS AND ENVIRONMENT, ENVIRONMENTAL RESOURCES

Fundamentals of Ecosystem, our earth's Environment. Types of ecosystems, characteristics features, structure and functions of Ecosystems – Forest, Grassland, Desert, Aquatic (lakes, rivers and estuaries).

## Module 2

### RESOURCES AND ENVIRONMENT: LAND, FOREST, WATER AND ENERGY AS ENVIRONMENTAL RESOURCES. HUMAN IMPACT ON ENVIRONMENT AND POLLUTION:

Local and Global Issues, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Urban and Industrial wastes, Recycling and Re-use, Global warming, Acid rain and Ozone layer depletion.

Loss of wet lands, mangroves, increasing desert areas, Social issues and the environment

## Module 3

### INSTITUTION AND GOVERNANCE

Institutional arrangement, Environmental legislation, Introduction to Government regulations, Introduction to Environmental Acts, (eg, Water Conservation and Control of Pollution Act, Air pollution control act, Environmental Protection Act, Wild life protection Act, Forest

Conservation Act, etc.)

**Module 4**  
**ENVIRONMENTAL MANAGEMENT**

Introduction to principles of sustainable development, Environmental quality and indicators, Management of environment, Introduction to Solid waste management.

**Module 5**  
Conduct case studies and prepare report on relevant areas.

**References**

1. Ecology/ Principles and application ; J.L Chapman & M.J Press; Cambridge
2. Environmental Economics; Charles. D Kolstad: Oxford University Press
3. The hidden connection; F.Capra , Harper and Collins
4. Agarwal, K. C. (2001). Environmental Biology. Bikaner :Nidhi Publications Ltd.
5. Benny, J. (2005). Environmental Studies. New Delhi : Tata McGraw Hill.
6. Bharucha, E. (2005). Text book of environmental studies for undergraduates courses. New Delhi : Universities Press, UGC. .
7. Brunner, R.C. (1989). Hazardous Waste Incineration. New Delhi : McGraw Hill.
8. Kaushik, A. and Kaushik, C. P. (2010). Basics of Environment and Ecology. New Delhi : New Age International Publishers.

<b>AR133</b>	<b>Introduction to Architecture</b>	<b>HRS 3-0-0</b>	<b>CR-3</b>
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**Objective**

This course is introduced in the beginning of the B.Arch. programme to impart an overall orientation towards Architectural course. To acquaint the students with fundamental knowledge of space and spatial organisation, basic aesthetic principles involved in architectural design, and approach to conceptualise and develop architectural design.

The course can be taught through interactive discussions, audio-visual presentations and creative assignments.

**Module 1**

**ARCHITECTURE, SPACE AND MASS**

Introducing Architecture as a profession and role of an Architect, Definition of architecture- elements of architecture - Concept of space, Articulation of form and space (Primary forms, properties of form, transformation of forms - dimensional transformation, subtractive, additive forms, organization of additive forms), Organisation of spaces, sense of enclosure, openings in space defining elements.

**Module 2**

**AESTHETIC COMPONENTS OF DESIGN**

Exploration of the basic principles of design such as Proportion, scale, balance, rhythm, contrast, harmony axis, symmetry, hierarchy, datum; Golden proportion, Theories of scale and proportion, Vitruvian theory, Modular man, Relationship between Art and Design with man, space and environment.

To be explained with building examples both historical as well as contemporary.

**Module 3**  
**SPATIAL ORGANISATION AND CIRCULATION**

Different types of spatial organizations of masses linear, centralised, radial, clustered, grid organization illustrations of buildings both historical & contemporary.

Building approach, building entrance, Configuration of path, Path space relationship.

**Module 4**

**DESIGN PROCESS**

Integration of aesthetics, function and form - Understanding of formative ideas, organization concepts, spatial characteristics.

Massing and circulation in design analysis of the following buildings: Falling water house & Guggenheim museum by F. L. Wright -Villa Savoye& Chapel of Notre dame Du Haut by Le Corbusier.

**Module 5**

Case studies of historical and contemporary site and buildings (Study of spatial organisation, form, element and art).

**References**

1. Francis D. K. Ching, *Architecture - Form, Space and Order*, Van Nostrand Reinhold Company, 1979
2. Roger H. Clark, Michael Pause, *Precedents In Architecture*, Van Nostrand Reinhold Company , 1996
3. K.W.Smithies, *Principles of Design in Architecture*, Van Nostrand Reinhold Company, 1981
4. Sam F. Miller, *Design Process - A Primer For Architectural & Interior Design*, Van Nostrand Reinhold Company , 1995
5. Ernest Burden, *Elements of Architectural Design – A Visual Resource*, Van Nostrand Reinhold Company , 1994
6. V.S.Pramar, *Design Fundamentals in Architecture*, Somaiya Publications, New Delhi, 1973.
7. Vitruvius, *Translation: Morris, H. M. (1960). The Ten Books on Architecture.*

## SESSIONALS/ PRACTICALS

AR144	ARCHITECTURAL GRAPHICS-I	HRS 0-0-6	CR-4
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### Objective

To train the students in the fundamentals of architectural drawing techniques and skills. Graphical presentation of objects through geometrical projection and visualization is taught in this course.

### Module 1

#### INTRODUCTION TO PLANE GEOMETRY

Introduction to the basic principles of drawing: Scale conversion etc., Practices in lettering, drafting, and dimensioning

Introduction to Plane geometry: Exercise in construction of Straight lines, Circles, Tangents and Regular polygons.

Description of Plane Curves: Ellipse, Parabola, Hyperbola, Helix and other special curves.

### Module 2

#### CONCEPT OF ORTHOGRAPHIC PROJECTION

First-Angle Projection, Projections of Points, Projections of Straight Lines, Projections of Planes, Projections of Solids.

### Module 3

#### SECTION OF SOLID

Section of solids, True shapes of section, Interpenetration of solids

### Module 4

#### DEVELOPMENT OF SURFACES

Surface development of simple solid forms leading to complex forms including interpenetration.

### Note

Along with progressive evaluation of class works, tests to be conducted for Descriptive Geometry as part of the internal and final evaluation process.

### References

1. Bhatt, N.D. and Panchal, V. M., Engineering Drawing, Charotar Publishing House, Anand, India.
2. Agarwal, B. and Agarwal, C.M., Engineering Drawing, Tata McGraw-Hill.
3. Kumar, M. S. , Engineering Drawing, D. D. Publications, Chennai.
4. Francis D. K. Ching& Steven P. Juroszek, Design drawing, John Wiley & Sons, USA, 1998.
5. I. H. Morris, Geometrical Drawing for Art Students, Orient Longman, Chennai.

<b>AR153</b>	<b>ARCHITECTURAL WORKSHOP</b>	<b>HRS 0-0-3</b>	<b>CR-3</b>
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### **Objective**

To equip students with the basic skills necessary to represent their ideas through models using different materials. To make students practice with various tools essential for making architectural models.

### **Module 1**

#### **INTRODUCTION TO MODEL MAKING**

Need for architectural models, Role of scale-models in design; General practices in model making; Types of models: block, detailed, construction & interior models. Introduction to concepts of model making and various materials used for model making.

### **Module 2**

#### **BASE AND BLOCK MODELLING**

Preparation of base for models using wood or boards, Introduction to block models of objects (3D Compositions) and buildings involving the usage of various materials like Thermocole, Soap/Wax, Boards, Clay etc.

### **Module 3**

#### **DETAIL MODELLING**

Making detailed models which includes the representation of various building elements like Walls, Columns, Steps, Windows/glazing, Sunshades, Handrails using materials like Mount-board, Snow-white board, acrylic sheets;

Representing various surface finishes like brick/stone representation, stucco finish etc;

Various site elements – Contour representation, Roads/Pavements, Trees/Shrubs, Lawn, Water bodies, Street furniture, Fencing etc

### **Module 4**

#### **JOINERY**

Simple exercises in cutting, finishing and joinery with simple blocks;

Use of carpentry tools and making joints such as Dovetail joint, Mortise and Tenon joint, Lap joint, Butt joint, etc. to be used for making furniture.

#### **MODELS OF STRUCTURAL SYSTEMS**

Making models of the various structural systems used in buildings like; Space frames – using Match sticks, wires; Different forms of shell roofs using POP, Clay, Soap; Tensile structures using fabric.

### **Module 5**

Flexible for the teacher to decide assignments for representing innovative ideas, and by using new materials and techniques.

### **References**

1. BENN, *the book of the house*, Ernest Benn limited London
2. Jannsen, *Constructional Drawings & Architectural models*, Kari Kramer Verlag Stuttgart, 1973.
3. Harry W.Smith, *The art of making furniture in miniature*, E.P.Dutton Inc., New York, 1982.
4. *Thames and Hudson Manual of Rendering with Pen and Ink*-Robert W Gill.
5. Ching, F. D. K. (2009). *Architectural Graphics*. 5th Ed. New Jersey : John Wiley & Sons.
6. Criss. B. M. (2011). *Designing with models: A Studio guide to Architectural Process Models*.3rd Ed. Hoboken :John Wiley & Sons.
7. Kieran, S. and Timberlake, J. (2008). *LobollyHouse : Elements of a New Architecture*. New York : Princeton Architectural Press.
8. Morgan, C. L. and Nouvel, J. (2002). *The Elements of Architecture*. London : Thames & Hudson.
9. Werner, M. (2011). *Model Making*. New York : Princeton Architectural Press.

<b>AR164</b>	<b>BASIC DESIGN-I</b>	<b>HRS 0-0-6</b>	<b>CR-4</b>
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### **Objective**

The course aims at building up the vocabulary in visual and basic design principles. Introducing students to fundamental techniques of Visual representation and to equip with the basic principles of representation. To enhance skills in developing a graphical language of architecture.

#### **Module 1**

##### **LEARNING SKETCHING, DRAWING, AND VISUAL THINKING**

Free-hand drawing appropriate to visual & architectural representation, indoor & outdoor sketching, drawing from observation, terminology, abbreviations and signage used in visual representation, Sheet layouts, art lettering, shading, symbols & scale; Introduction to fundamentals of visual representation: Points, line & shape, tone & texture, figure & ground, Colour & value.

#### **Module 2**

##### **COMPOSITION**

Making two dimensional and three dimensional compositions involving various elements of design such as Line, Shape, Colour, Texture, Transparency, Mass, space etc., aimed at understanding the principles of design such as Repetition, Harmony, Contrast, Dominance, Balance, Dynamism, etc.

#### **Module 3**

##### **SCULPTURAL FORMS & SPACES**

Making three dimensional sculptures involving the basic platonic solids and abstract sculptures:

explore play of light & shade and application of colour.

Introduction to external & internal forms, Concept of space, interrelationship between space, volume and order

Variations in forms with planar juxtapositions, Understanding the Elementary structural forms

#### **Module 4**

##### **FORMS IN NATURE**

Study of forms in nature and analysis with respect to their colour, form, texture and structure.

Exercises involving these natural forms and various approaches to art such as – Representation, Abstraction and Non-Representational/ Non-Objective compositions.

#### **Module 5**

Faculty to decide on explorative Basic Design assignments for students.

### **References**

1. Charles Wallschlaeger & Synthia Busic Snyder, *Basic Visual Concepts & Principles for artists, architects & designers*, McGraw hill, USA, 1992.
2. Paul Zelanski & Mary Pat Fisher, *Design principles & Problems*, 2nd Ed, Thomson & Wadsworth, USA, 1996
3. Owen Cappleman & Michael Jack Kordan, *Foundations in Architecture: An Annotated Anthology of beginning design projects*, Van Nostrand Reinhold, New York.
4. Trewin Coppstone, *Arts in Society*, Prentice Hall Inc, Englewoods Cliffs, N. J. 1983. 4. H. Gardner, *Art through ages*.
5. Paul Laseau. (2001). *Graphic Thinking For Architects and Designers*, John Wiley & Sons, New York

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6. Ching, F. D. K. (1997). *Design Drawing*. Hoboken : John Wiley & Sons.
7. Ching, F. D. K. (2012). *Architecture: Form, Space and Order*. 3rd Ed. Hoboken: John Wiley & Sons.
8. Broadbent, G. (1973). *Design in Architecture - Architecture and Human Science*. John Wiley and Sons, New York
9. Chauhan, P. (2005). *Learning Basic Design*. Mumbai : Rizvi College of Architecture.

<b>AR174</b>	<b>BUILDING MATERIALS AND CONSTRUCTION-I</b>	<b>HRS 0-0-6</b>	<b>CR-4</b>
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### **Objective**

To understand fundamental building material in the context of various construction methods. Focus on various building materials would be emphasised based on the performing standards and codes, wherein application of each material would be discussed in detail, both in the context of traditional and modern construction methods and practices. Based on the lecture delivered, the students are required to produce report on materials, construction and detail drawings. With time, each topic can also focus on latest trends in practice and usage of new technology/materials.

### **Module1**

#### LECTURE

General introduction to building materials, Natural building materials; stone, mud, sand, timber. Building construction materials; bricks, terracotta, Lime mortar, cement mortar, concrete etc.

Bricks: Types, qualities and application method

#### SHEET WORK

Brick masonry- Masonry tools & equipment. Different types of bricks. Bonding of bricks & its principles, Stop end, T, L & cross Junctions of English bond & Rat trap bond and Non-structural bond. Attached & detached piers. Brick jallis, Corbelling, Cornices, Types of coping, pointing & Threshold

### **Module 2**

#### LECTURE

Stones: Types, qualities and application method

#### SHEET WORK

Stone Masonry-Random rubble masonry, Ashlars masonry, coursed and un coursed rubble masonry etc. Walls with stone facing and brick backing (composite wall)

### Module 3

#### SHEET WORK

Different types of walls using alternative cost effective techniques (Different types of mud walls, Cob walls, Adobe blocks, wattle Daub).

Construction detail of brick and stone arches, Lintels, brick domes.

### Module 4

#### LECTURE

Soils: Formation –Types, property, Specific gravity, grain size, distribution, plasticity, characteristics and phase relationship, Identification, Local names, I.S.I. Classification, Sources and uses of sand, fineness modulus.

#### SHEET WORK

Simple foundations with trenches for load bearing walls; Sections of compound walls, retaining wall, foundation for steps.

### Module 5

Any other topic as per present day need as decided by the teacher.

#### NOTE:

- Frequent site visits to be arranged as a part of the curriculum. Site visits should be in line with the present studio work. It is mandatory for students to submit a site observation report, either periodically or at the end of the semester.
- Pedagogy should establish the linkage of the relevant material and construction techniques from past to present.
- Performing standards and Codes used for various Building Materials and Construction Techniques needs to be focused.
- Alternative construction techniques for respective topics needs to be discussed in detail.

### References

1. Barry, R. (1999). The Construction of Buildings Vol. 2. 5th Ed. New Delhi : East-West Press.
2. Foster, J. and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed. London : B.T. Batsford Ltd.
3. McKay, W. B. (2005). Building Construction Metric Vol. I–V. 4th Ed. Mumbai : Orient Longman.
4. Hailey and Hancock, D. W. (1979). Brick Work and Associated Studies Vol. II. London : MacMillan.
5. Merritt, F.S. and Ricketts, J.T., Building Design and Construction Handbook, McGraw Hill.
6. Rangwala, S. C. (1963). Building Construction: Materials and types of Construction. 3rd Ed. New York : John Wiley and Sons.
7. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London : Butterworth-Heinemann.
8. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi : Standard Publishers.
9. Ching, F. D.K – Building Construction illustrated. VNR, 1975
10. A.Agarwal –Mud: The potentials of earth based material for third world housing – IIED, London, 1981.
11. HUDCO – All you wanted to know about soil stabilized mud blocks, New Delhi, 1989.

<b>AH182</b>	<b>COMMUNICATIVE ENGLISH</b>	<b>HRS 1-0-2</b>	<b>CR-2</b>
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### **Objective**

This is a practice-oriented, need-based, functional-communicative course. It seeks to develop the student's skills of communication in listening, speaking and writing. Reading, though formally not included, is still a recommended activity. The student is advised to cultivate the habit of reading newspapers, magazines and books in a free, extensive manner to consolidate the skills already achieved. A more interactive process of teaching/learning is called for in order to achieve the skills of effective communication.

The course attempts to familiarize the student with the sounds of English in a nutshell, particularly long and short vowels, some consonants, stress and intonation. Provide adequate listening and speaking practice so that the learner can speak with ease, fluency and reasonable clarity in common everyday situations and on formal occasions. Use of grammar in meaningful contexts and doing things with words, i.e. performing functions like ordering, requesting, inviting and so on are to be extensively practised.

### **Module 1**

#### **COMMUNICATION**

Verbal and non-verbal spoken and written; Language functions-descriptive, expressive and social; To inform, enquire, attract, influence, regulate and entertain; Bias-free and plain English Formal and informal style.

### **Module 2**

#### **WRITING I**

Paragraph writing - topic sentence, cohesion and coherence - sentence linkers (so, but, however, etc.); Preparation of a business report - writing a business proposal - format, length, structure

### **Module 3**

#### **WRITING II**

Preparing notes - writing business letters and E-Mail messages;

Documentation: *References*, notes and bibliographies.

### **Module 4**

#### **WRITING III**

Writing curriculum vitae (both chronological and functional) along with an application for a job; Public relations - concept and relevance; PR in a business organization - handling the media.

### **Module 5**

#### **MEETING AND PRESENTATION**

Organizing a meeting, preparing an agenda, chairing a meeting, drafting resolutions, writing minutes; Making an oral Presentation; Facing an interview

**References**

1. Geoffrey Leech and Jan Swartvik " A communicative Grammar of English, Longman
2. O'connor, J.D., Better English Pronunciation, ELBS.
3. Chand, J.K. and Das, B.C., A Millennium Guide to writing and Speaking English, Friends' Publishers
4. John, S., Oxford Guide to Writing and Speaking English, OUP.
5. BoveeEtal, Business Communication Today, Pearson Education.