# COURSE STRUCTURE: FIRST YEAR B.ARCH. PROGRAMME

## 1st SEMESTER

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sub. Code</th>
<th>Theory</th>
<th>Contact Hrs. (L-T-P)</th>
<th>Credit</th>
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<th>University Marks</th>
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<tr>
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**Total Credits in the semester**: 26  
**Total Marks in the semester**: 950
## IInd SEMESTER

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**Total Credits in the semester** | **26**

**Total Marks in the semester** | **950**
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 derivation/ Standard Derivation, Variance), Co-relation and Regression.
Module 5

Relevant mathematical topics as decided by the subject faculty

References


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

AR133 Introduction to Architecture HRS 3-0-0 CR-3

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

SESSIONALS/ PRACTICALS

<table>
<thead>
<tr>
<th>AR144</th>
<th>ARCHITECTURAL GRAPHICS-I</th>
<th>HRS 0-0-6</th>
<th>CR-4</th>
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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
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 Thermocol, 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 Mountboard, 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
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:
exploration 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
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.

Module 1

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

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 focused.
• Alternative construction techniques for respective topics needs to be discussed in detail.

References
11. HUDCO – All you wanted to know about soil stabilized mud blocks, New Delhi, 1989.
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

2. O’connor, J.D., Better English Pronunciation, ELBS.
4. John, S., Oxford Guide to Writing and Speaking English, OUP.