FIRST YEAR SYLLABUS FOR B.ARCH. PROGRAMME

COURSE STRUCTURE: FIRST YEAR B.ARCH PROGRAMME

1st SEMESTER

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<thead>
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<th>Sl No.</th>
<th>Code</th>
<th>Theory</th>
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<td>1.</td>
<td>AH113</td>
<td>Mathematics- I</td>
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<td>AS123</td>
<td>Mechanics- I</td>
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<td>3.</td>
<td>AR133</td>
<td>Theory of Architecture</td>
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<td>4.</td>
<td>AR143</td>
<td>Building Material-I</td>
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**TOTAL** 12

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<tr>
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<tr>
<td>5.</td>
<td>AR154</td>
<td>Descriptive Geometry-I</td>
<td>0-0-6</td>
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<td>AR162</td>
<td>Model Making Wksp - I</td>
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<td>9.</td>
<td>AR192</td>
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**TOTAL** 14

**Total Credits** 26

2nd SEMESTER

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<td>History of Architecture - I</td>
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<td>4.</td>
<td>AR243</td>
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**TOTAL** 13

**Total Credits** 25
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<td>AS333</td>
<td>Structural Analysis – I</td>
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<td>AR343</td>
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<td>5.</td>
<td>AR352</td>
<td>Climatology</td>
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<tr>
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<td>6.</td>
<td>AR366 Architectural Design – I &amp; Measured Drawing</td>
<td>0-0-9</td>
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<td>7.</td>
<td>AR372 AutoCAD – I</td>
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<td>8.</td>
<td>AR382 Climatology Lab</td>
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<td>9.</td>
<td>AR392 Bldg Const - III</td>
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**Total Credits:** 12

**Total Credits:** 26

### IVth Semester

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<tbody>
<tr>
<td>1.</td>
<td>AH412 Sociology</td>
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<td>2.</td>
<td>AM423 Building Services – II (Refrigeration &amp; Air Conditioning)</td>
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<td>AS433 Surveying - I</td>
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<td>AR443 History of Architecture- III</td>
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<td>5.</td>
<td>AR453 Environmental Studies</td>
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**Total Credits:** 14

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<td>6.</td>
<td>AR466 Architectural Design – II</td>
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<td>7.</td>
<td>AR472 AutoCAD – II</td>
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<td>AR482 Bldg Const - IV</td>
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<td>AS492 Surveying Lab</td>
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<td>10.</td>
<td>AR402 Architectural Photography</td>
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**Total Credits:** 14

**Total Credits:** 28
## Vth Semester

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<tr>
<td>1.</td>
<td>AR513 Contemporary Architecture</td>
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<td>2.</td>
<td>AR523 Building Services - III(Acoustics)</td>
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<td>AS534 Concrete Structure</td>
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<td>AH542 Economics</td>
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<td>5.</td>
<td>AR553 Interior Design</td>
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**TOTAL 15**

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<td>6.</td>
<td>AR566 Architectural Design – III</td>
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<td>AR572 AutoCAD – III</td>
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**TOTAL 14**

**Total Credits 29**

## VIth Semester

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<td>AS614 Steel Structure</td>
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<td>2.</td>
<td>AE623 Building Services - IV(Illumination)</td>
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<td>AR633 Landscape Design</td>
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<td>AS642 Estimation</td>
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<td>5.</td>
<td>AR653 Specification</td>
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**TOTAL 15**

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<tr>
<td>6.</td>
<td>AR666 Architectural Design – IV</td>
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<td>AR674 Working Drawing -II</td>
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<td>8.</td>
<td>AR682 Landscape Design &amp; Site Planning</td>
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**TOTAL 12**

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<tr>
<td>1.</td>
<td>AR713 Principle of Human Settlements</td>
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<td>2.</td>
<td>AR723 Construction &amp; Project Mgt</td>
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<td>AR733 Housing</td>
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<td>AR743 Urban Design</td>
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<td>5.</td>
<td>AR753 Elective I: Cost Effective Tech / Traditional Architecture</td>
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<td>AR763 Elective II: Solar Architecture/ Medical Architecture</td>
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<td>1.</td>
<td>AR716 Arch Design – V &amp; Field Trip</td>
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<td>AR722 Architectural Details</td>
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<td>AS732 Structural Drawing &amp; Details</td>
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**Total Credits** 28

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<tr>
<td>1.</td>
<td>AR813 Contract Documents &amp; Bldg Byelaws</td>
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<td>AR823 Disaster Resistant Architecture</td>
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<td>AR833 Research Methods</td>
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<td>4.</td>
<td>AR843 Elective III: Town &amp; Country Planning/ Transportation planning</td>
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<td>5.</td>
<td>AR853 Elective IV: Barrier Free Environment/ Industrial Architecture</td>
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**TOTAL** 15

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<td>1.</td>
<td>AR818 Arch Design – VI &amp; Field Trip</td>
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<td>AR822 Seminar</td>
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<td>AR831 Seminar (Project)</td>
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**TOTAL** 11

**Total Credits** 26
## IX th SEMESTER

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<td>AR913</td>
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<td>AR9212</td>
<td>Thesis/ Dissertation</td>
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<td>AR932</td>
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**Total Credits**: 17

## X th SEMESTER

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<tr>
<td>1.</td>
<td>AR014</td>
<td>Architectural Office Training</td>
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<td>AR023</td>
<td>Site Supervision Training</td>
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<td>AR032</td>
<td>Field Observation Studies</td>
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<td>AR042</td>
<td>Critical Appraisal of Building Projects</td>
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<td>AR053</td>
<td>Field Documentation &amp; Architectural Details</td>
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**Total Credits**: 14
The intent of the mathematics courses for architecture students is three fold (i) modeling: Converting given data of a physical situation into a mathematical form (ii) solving them by standard techniques and (iii) interpreting the results. It is expected that students should not only know different mathematical techniques but should also be conversant with different applications.

**Module 1 (10 Classes)**
Calculus: Curve tracing, curvature, asymptotes

**Module 2 (10 Classes)**
Linear differential equations of second and higher order, homogeneous equation with constant coefficients.

**Module 3 (10 Classes)**
Series solution of differential equation: Power series method, Legendre's equation, Legendre's polynomial. Bessel's equation, Bessel's functions $J_n(x)$

**Module 4 (8 Classes)**

The course is covered by:

1. *Calculus: Gorakh Prasad:*
2. *Advance Engineering Mathematics - E. Kreyszig*
3. *John Wiley & sons Inc. - 8th edition*
   - Chapter 1 (1.1-1.7)
   - Chapter 2 (2.1 - 2.10, 2.12)
   - Chapter 4 (4.1-4.6)
   - Chapter 5 (5.1-5.7)

**AS124 MECHANICS - I (3-0-0)**

**Statics**

**MODULE - I** (Force Analysis)
Principles of Statics, Equilibrium of concurrent forces in a plane, Plane Trusses: Method of Joints, Method.

**MODULE II** - (Centre of Gravity)
Centre of Parallel Forces in a plane, Centre of gravity, Centroids of composite Plane Figures, Centroids of curves, Distributed force in a plane.

**Dynamics**

**MODULE - III** (Kinematics)
Rectilinear Translation: Kinematics of rectilinear motion, Principles of dynamics, Differential equation of rectilinear motion, Force as a function of time, Force proportional to displacement,
MODULE - IV

Textbooks:


Reference Book:

(2) Engineering Mechanics, K. L. Kumar, TMH

AR133 THEORY OF ARCHITECTURE (3-0-0)

Objective:
To acquaint the students with the basic aesthetic principles involved in architectural design.

Outline:

Role and meaning of art various types of arts - fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art, etc., relationship of architecture with other arts like painting and Sculpture. Principles of architectural composition unity, balance, proportion, scale, rhythm, contrast, harmony, accentuation, restraint, definition, repose, vitality, strength, with the help of illustrations of buildings, both historical as well as contemporary.

Organising principles of architectural composition- symmetry, hierarchy, datum, axis - different types of spatial organizations of masses linear, centralised, radial, clustered, grid organization illustrations of buildings both historical as well as contemporary.

Use and need of ornament in architectural design - different types of ornamentation in buildings - historical perspective of the use of ornament in buildings. Use of different materials like brick, timber, stone, concrete, glass for aesthetic and structural purposes.

References:

1. "Form, Space and Order" by Francis D.K. Ching
2. "Design Fundamentals in Architecture" by Parmar V.S.

AR143 BUILDING MATERIAL - I (3-0-0)

General introduction to buildings, Natural materials clay materials, bricks, terracotta, stones, timber.

Soils: Formation – Index 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.

Bricks : Types and their qualities and their manufacture.

Lime : Fat and Hydraulic lime, their uses and properties, manufacture of lime, preparation of lime
mortar, functions and requirements of good mortar, mix proportions of various works.

Stones : Types and their qualities and their methods of quarrying.
Cement : Type, properties, composition and manufacturing process and setting of cement
composition of cement mortar. Plastering.

Cement Products : Mosaic tiles, CC work etc., Proportions, constitute materials of plain cement
concrete including light weight concrete , aerated , cellular, form and such other types of cement
concrete products , artificial stone.

Visits to work under construction, to study brick work, stone work and wood work. Report with
sketches of visits to be submitted by each student a sessional work.

Introduction to building technology – building components and their functions. Rural
construction (Using rural materials like soil, Clamp burnt bricks, thatch, coconut and bamboo
trunks, flat tiles) Types of foundations, Types of walls, and simple trusses. Types of flooring and
finishes.

References:

1. S.C. Rangwala, Engineering Materials , Charotar publishing house,
   Anand, 1982
2. S.C. Rangwala, Building Construction , Charotar publishing house,
   Anand.

AR152 DESCRIPTIVE GEOMETRY – I (0-0-6)

Concept of Orthographic Projection, First-Angle Projection, Projections of Points, Projections of
Straight Lines, Projections of Planes, Projections of Solids, Intersection of Surfaces,
Development of Surfaces, Isometric Projection

Uses of instruments in architectural drafting, dimensioning. Plan and proportional scales. Lines
and angles, proportional, triangles, quadrilaterals, circles and tangents. Circles touching lines,
regular, polygons, arches, plane curves. ellipse, parabola and hyperbola. Geometrical construction
of mouldings and tracery.

Geometry of lines..and planes, Geometrical shapes (two dimensional)-polygons volutes. Study of
solid geometrical forms in various positions including group of forms. Simple Projections and
projections of solids, Polyhedron, solids of revolution, solids in simple position, Axis
perpendicular to a plane, Axis parallel to both the plane, Axis parallel to one plane and inclined to
other. Axis inclined to both the planes, spheres.

Section of solids-Section planes, True shapes of section, sections-of prisms, sections of pyramids,
cylinders, cones etc.

Interpenetration of solids and representation in two-dimension. Analysis of complex forms
(mouldings, vaults etc) at different intersections. Surface development of simple solid forms
leading to complex forms including interpenetration.

Isometric and Axonometric projections.
References:

   Ch - 8, 9, 10, 12, 13, 15, 16 & 17

**AR162 MODEL MAKING WORKSHOP – I (0-0-3)**

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.

Instructions on the use of tools and materials such as Clay, Thermocol, Paper and Softwood etc. for making architectural models.

**AH173 COMMUNICATIVE ENGLISH (1-0-2)**

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.

**Specific Objectives**

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 grammar in meaningful contexts.

Things with words, i.e. to perform functions like ordering, requesting, inviting and so on

**Module-I**

Communication (6 hours)
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
Format and informal style

**Module-II**

WRITING-I (7 hours)
1.1 Paragraph writing - topic sentence, cohesion and coherence – sentence linkers (so, but,
Module-III

WRITING-II (7 hours)
1.2 Preparation of a business report - writing a business proposal - format, length, structure

Module-IV

WRITING-III (7 hours)
3.1 Writing a curriculum vitae (both chronological and functional) along with an application for a job.
3.2 Public relations - concept and relevance - PR in a business organization - handling the media.

Meeting and presentation (9 hours)
4.1 Organizing a meeting, preparing an agenda, chairing a meeting drafting resolutions, writing minutes.
4.2 Making an oral Presentation
4.3 Facing an interview

Books prescribed:

1. Geoffrey Leech and Jan Swartvik, Longman " A communicative Grammar of English,
2. J.D. O'connor, Better English Pronunciation, ELBS

(John Sealy) Oxford Guide to Writing and Speaking English, OUP. (Bovee etal) Business Communication Today Pearson Education. (Rovi and Rai) Business Communication,


(J.K. Chand and B. C. das) A Millennium Guide to Writing and Speaking, (Friends Publishers)


AR184 BASIC DESIGN (0-0-6)

Aim: The study aims at building up the vocabulary in visual and basic design principles.

1. To study & practice through lettering exercises & graphical presentations techniques.

2. To study the fundamentals of visual –design such as points, lines, planes, colours, textures, etc. resulting into
   2-dimensional composition.

3. Understanding the various principles of composition eg. Symmetry, Rhythm, Harmony, Contrast, Balance, Monotony etc.
4. Study of visual relationships through exercises on placement of objects at different eye-levels and different distances.
5. i) Study of basic terms such as surface, form, space and understanding their relationship to each other.
   ii) Two dimensional studies in surface composition, arrangements, relationships, continuity etc.
   iii) Three dimensional studies in Stability relationship, balance, composition etc.
6. Understanding the Elementary structural forms.

References:
1. V.S.Parmar, Design fundamentals in Architecture, Somaiya {publications private limited, New Delhi.

AR192 BUILDING CONSTRUCTION – I (0-0-3)

Brick masonry: Masonry tools and equipment, bending and its principle, headers, stretchers, king and queen closers, English and Flemish bonds for corner, tee and cross junctions in 35 cms, 23 cms and 11 cms brick walls and buttress and pilasters and piers of 45,35 and 23 cms size, section of a compound wall.

Stone masonry: Various types of stone dressing, plain bevelled, and rebated joints, dowels and cramps, quoins, headers and bond. Rubble, and Ashlar masonry walls, walls with stone facing and brick backing.

Simple foundations: Simple foundation for masonry load bearing walls and piers.

Sessional work based on above topics.

References:


2ND SEMESTER

AH214 MATHEMATICS – II (3-0-0)

Module 1
Linear algebra: matrices, vectors, determinants and linear system of equations, matrices and linear system of equations, matrix eigen value problems, symmetric, skew symmetric matrices and orthogonal matrices.

Module 2

Module 3
Line integrals, Green theorem: Surface integrals, Gauss theorem, Stockes theorem

Module 4
Fourier series: Fourier series, Expansions functions of any period, even and odd functions, half range expansion.

Course covered by: Advance Engineering mathematics by E. Kreyszig, 8th Edition
Chapter 6 (6.1 - 6.7)
Chapter 7 (7.1 - 7.5)
Chapter 8 (8.1 - 8.4, 8.9 - 8.11)
Chapter 9 (9.1 - 9.9)
Chapter 10 (10.1 -10.4)

AS223 MECHANICS - II (3-0-0)

Statics

MODULE - I (Virtual Work)
Principles of virtual work: Equilibrium of Ideal Systems, Efficiency of simple mechanics, Stable and unstable equilibrium.
Text: Tuinoshenko, Ch-5

Dynamics

MODULE - II (Kinematics)
Kinematics of Curvilinear motion, Motion of Projectile, Moment of Momentum, Work & Energy in curvilinear motion.
Kinematics of Rotation, Rotation under the action of a constant moment, The compound pendulum,
MODULE - III (Moment of Inertia)

Moments of Inertia of Plane Figures with respect to an axis in its plane, with respect to an axis perpendicular to the plane, Parallel axis theorem, Product of inertia, Principal axes and Principal moments.1 of inertia.

Solid Mechanics

MODULE - IV (Concepts of Stress & Strain)

Concepts of Stress and Strain, Normal stress, Sheer stress, normal strain, shear strain, Hooke's law, Poisson's ratio, Principal stresses, Principal strains, Mohr's Circle for stress and strain.

Textbooks:


Reference Books:


Engineering Mechanics, K. L. Kumar, TMH

Elements of Strength of Materials by Tuimoshenko & Young

AR233 HISTORY OF ARCHITECTURE – I (3-0-0)

The uses of History and the need for the study of the History of Architecture. The origins of Architecture. The Houses, the temple and the tomb. The sciences connected with ancient Architecture, lick cosmology, Geometry, etc. Houses from various regions of the Earth. Definition of space, form and time. Study of architecture and critical appreciation of the Indian History. ANCIENT INDIA - Impact of; Aryan culture, Vedic religion. The Mauryan Dynasty, The emergence of Empire, Trade routes and communication.


References:

AR243 BUILDING MATERIAL – II (3-0-0)


Iron and Steel: Cast iron, steel and wrought iron with properties, brief idea of manufacturing process and use of iron work in buildings.

Paints and Varnishes: Composition, manufacture and properties and uses of ordinary paints, varnishes and wood preservatives, method of distempering wall surfaces, and painting of timber and iron work.

Glass: Types of glass like plate, decorative, tinted, heat absorbing etc. Structural glass bricks and glasscrete, fibre glass, wool etc. Corrugated galvanized iron sheets and asbestos cement sheets with accessories and wood preservatives, methods of their fixing, clay tiles – Mangalore, Allahabad and Country type.

References:

AR252 DESCRIPTIVE GEOMETRY - II (0-0-3)


AR263 VISUAL GRAPHICS (1-0-3)

Aim: To study and understand the use of colours and rendering techniques to prepare 2 & 3 dimensional presentations. The subject also aims to enhance the skills in Visual perceptions of design theories.

1. Study of colours and colour schemes.
   - Composition with primary, secondary & tertiary colours
     ……..2 sheets
   - Composition with complementary, split and analogous colours
     ……..2 sheets
2. Study of light and shade effects on simple objects.
   Exercises in 2 & 3 dimensional compositions with effects of light and shade
   ........2 sheets
3. Sketching of simple natural / manmade forms in combination with trees, human figures etc
   using pencil
   ........2 sheets
4. Rendering buildings and other manmade forms in combination with natural elements using
   pen and ink, charcoal, water colours etc.
   ........2 sheets
5. Study of scales and proportions with perspectives of simple geometric forms.
   - 2 dimensional compositions on straight linear form.
   - 3 dimensional composition on convex-concave and curvilinear forms.

AR272 MODEL MAKING WORKSHOP – II (0-0-3)

Introduction to modeling with plastics, acrylics, boards, P.O.P. and Tiles. Exercises to be
developed individually for Architectural models.

AR284 BASIC DESIGN – II (0-0-6)

Objective: Understanding of elements of visual – design translated into detailed drawings &
drafting techniques for Architectural-design presentation i.e. Plan, Elevation, Section,
Perspectives, Site plan & Model.

1. Measured drawings of different furniture types, doors, windows etc.
   Dimensional compositions using repetitively the same forms to create different
   arrangements
   incorporating, understanding of Activity, Users circulation etc.
   Dimensional composition resulting into spaces.
2. Quantitative & qualitative analysis of 3-dimensional space. Perception of space in
   terms of mundane, vibrant, soothing, irritating, free flowing etc. Indoor and Outdoor
   space relationship.
4. Simple imaginative problems – Memorials, bus Shelter, park furniture etc. Model of
   the design problems in appropriate scale.
5. Characteristics of built form – Hi-tech, Urban, Rural, Simulation of different built
   forms in landscape setting. Model and building visualization.

References:

1. V.S. Parmer, Design fundamentals in Architecture, Somaiya {publications private
   limited, New Delhi.
2. Francis D.K. Ching, Architecture-Form, space and order, Van, Nostrand Reinhold
   company, New; York.
Lintel and Arches: Brick, stone, timber and RC.C. lintels Arches: Flat, segmental, semicircular, parabolic, elliptical in brick and stone masonry, Joggle joint.
Simple Timber Doors- Ledged braced battened and paneled door.
Simple Timber Roofs: Roof layout, ridge, hip, valley, gable etc., Lean to, couple and collar roof with tile and sheet covering.
Cladding in walls. Prefabricated building components.
Sessional work based upon above topics.

References: