SYLLABUS

BACHELOR OF ARCHITECTURE (B.Arch)

I, II, III, IV & V Year

2019-20
## CONTENTS

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|       |              |                                      | Total   | CREDITS      | DURATION OF     |                     |
|       |              |                                      |         | 1000         | THEORY PAPER   |                     |</p>
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**Total Credits:** 12
**Total Periods:** 6
**Total Evaluation Scheme Credits:** 15
**Total Sessional Assessment Credits:** 33

**Grand Total:** 1000
# BACHELOR OF ARCHITECTURE (B.ARCH)

**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW**

**BACHELOR OF ARCHITECTURE**

**SEMESTER - III**

## SCHEME OF TEACHING AND EXAMINATION

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# Scheme of Teaching and Examination

**Bachelor of Architecture (B.Arch)**

**Dr. A.P.J. Abdul Kalam Technical University, Lucknow**

**Bachelor of Architecture**

**Semester - IV**

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## Scheme of Teaching and Examination

### Bachelor of Architecture (B.Arch)

### Semester V

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### Total Periods: 16

### Total Evaluation Scheme: 33

**Grand Total:**

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## BACHELOR OF ARCHITECTURE (B.ARCH)

### DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

### BACHELOR OF ARCHITECTURE

#### SEMESTER - VI

### SCHEME OF TEACHING AND EXAMINATION

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## BACHELOR OF ARCHITECTURE (B.ARCH)

**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW**

**BACHELOR OF ARCHITECTURE**

**SEMESTER - VII**

**SCHEME OF TEACHING AND EXAMINATION**

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### Scheme of Teaching and Examination

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**Grand Total:** 1000  24

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**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW**

**BACHELOR OF ARCHITECTURE**

**SEMESTER - IX**

**Curriculum Structure and Evaluation Scheme**

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9 | CURRICULUM STRUCTURE AND EVALUATION SCHEME
### BACHELOR OF ARCHITECTURE (B.ARCH)

**DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW**

**BACHELOR OF ARCHITECTURE**

**SEMESTER - X**

**SCHEME OF TEACHING AND EXAMINATION**

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B.Arch. Credit Schedule for All Semesters &
Syllabus for First & Second Semesters
In Accordance to Choice Based Credit System

To be effective from the session 2016 - 17
BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 101, ARCHITECTURAL DESIGN - I

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OBJECTIVES

- Orientation of students to the profession of architecture.
- Introduction to basic design and the basic understanding of form and space in architecture.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Orientation to the Architecture Profession

- Role of an Architect in the built environment.
- Building process, Role of other professional in building.

Module-2 Space and Architecture

- Understanding design as to create for a particular purpose and architectural design as to create space – exercise in terms of simple drawing and sketching of objects available in nature and surroundings.
- Form created through lines (columns) and planes (volumes), combination thereof.

Module-3 Form and Transformations

- Additive, Dimensional, Subtractive- exercises primarily through 3-D models of simple geometrics.

Module-4 Scale in Architecture

- Simple measurement exercises.

Module-5 Order in Architecture

- Geometrical, Structural, Dimensional, Material, Spatial order - through observation of surroundings as well as simple exercises in 2-D and 3-D. Exercises in order and transformations of form and space.

REFERENCE BOOKS


CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 102, CONSTRUCTION & MATERIALS – I

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OBJECTIVES
- To familiarize the students with constituents, properties and uses of traditional building materials used in construction.
- To understand the usage of these traditional building materials in simple building works.
- To develop skills in understanding the complexities & constraints of brick masonry.
- To familiarize the student with the basic building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Clay & Clay Products
- Mud including stabilised earth, Burnt Bricks, Brick Tiles, Brick Ballast and Surkhi

Module-2 Lime
- Availability, Preparation and Uses
- Cement
- Manufacture and Properties.
- Sand & Surkhi
- Characteristics, Availability and Uses.

Module-3 Mortar
- Mud, Lime, Cement.
- Concrete
- Lime, Cement.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit brick kiln/ lime kiln/ cement factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice
- Practicing in construction yard by making the examples of brick masonry works etc.

Module-5 Site Exposure
- Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS
1. To study the various tools, equipments used in masonry works.
2. To construct examples of brick masonry works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Element of Building
- Terminology, Nomenclature of various parts of building from foundation to roof.

Module-7 Brick Work
- Brick Terminology, Simple Bonds e.g. English bond & Flemish (single and double) bond in brick work for up to two brick thick walls.

Module-8 Brick Work
- Details at quoins and junctions in English bond and Flemish bond for up to two brick thick walls.

Module-9 Brick Work
- Details of piers (attached and detached), Buttresses, Lintel and Sill. Corbelling, Coping, String courses.

Module-10 Brick Work
- Special Bond - Rat Trap Bond. Brick jalis.

CONSTRUCTION PLATES
1. To understand the types of bricks.
2. To understand square stopped ends of said bonds in brick masonry.
3. To understand L, T and X Juncions of said bonds in brick masonry.
4. To understand of piers (attached and detached), Buttresses, Lintel, Sill, Corbelling, Coping, and String Courses.
5. To understand Special Bond - Rat Trap Bond.
6. To understand the application of Cavity walls and Brick jails in brick masonry

**APPROACH**
- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian climatic conditions.
- Site visits and market surveys will be an integral part of sessional work.

**REFERENCE BOOKS**
5. Building Construction, Mitchell (Elementary and Advanced)
15. Engineering Material-Roy Chowdary

**CRITERIA FOR ASSESSMENT OF SESSIONALS**

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BACHelor OF ARCHitecture (B.Arch)

B. ARCH. SEMESTER – I
RAR – 103, ARCHITECTURAL STRUCTURES-I

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OBJECTIVES:
- To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

Module-1 Elements of Statics
- Force, Law of parallelogram of forces, Law of triangle of forces, Polygon Law of forces, Resolution of forces. Resultant of number of concurrent coplanar forces. Condition of equilibrium, Moment of force, Moment and arm of couple, Theorems on couples.

Module-2 Simple Stresses and Strains
- Elasticity, Stress, Strain, Types of stresses, Elastic limit, Hook’s law, Modulus of elasticity, Modulus of rigidity, Bulk modulus, Stresses in composite bars/section, Modular ratio, Equivalent area of a compound section. Primary or Linear strain, Poison’s ratio, Shear stress, Principal stresses and strains (for simple cases), Mohr’s circle.

Module-3 Centre of Gravity & Moment of Inertia
- Definition, Methods of finding out centre of gravity of simple figures, Centre of parallel forces. Definition, Important theorems, Calculation of moment of inertia of different shapes and its application, Moment of inertia of composite sections.

Module-4 Shear Force and Bending Moments
- Beams shearing force and bending moment, Shear force and Bending moment diagrams for cantilever and simply supported beam, and overhanging beam.

Module-5 Stresses in Beams
- Simple beams bending, Section modulus, Moment of resistance, Shear stress in section of beam.

REFERENCE BOOKS
4. Senol Utku, “Elementary Structural Analysis”.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 104, ARCHITECTURAL DRAWING- I

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OBJECTIVES
- To familiarize with drawing tools and accessories.
- To give a basic knowledge of good drafting and lettering techniques.
- To develop comprehension and visualization of geometrical forms.
- To familiarize with the concept of enlarging and reducing scales.

SECTION – A, ARCHITECTURAL DRAWINGS & MODELS (MANUAL)
Module-1 Free Hand Drawing and Lettering
Module-2 Basic Technical Drawing
Module-3 Orthographic Projections
Module-4 Orthographic Projections
Module-5 Development of Surfaces
Module-6 Solid Geometry

REFERENCE BOOKS
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.Arch)

B. ARCH. SEMESTER – I
RAR – 105, ARTS AND GRAPHICS - 1

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OBJECTIVES
- Introduction to art and appreciation of art and its philosophies.
- Familiarization with principles and theories of art
- Development of art and graphic skills.

Module-1  Relevance of Art in Life
Art, artist, society and religion. Interrelation between Art and Architecture. Introduction of Aesthetics

Module-2  Colour Theory
Its psychological and emotional aspect in application

Module-3  Skill Developing Exercises
Free hand sketching, Still life drawing, Water colour, crayons, Dry pastels, Pen and Ink.
Drawing from observation of nature and live objects.

REFERENCE BOOKS

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

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OBJECTIVES

- To inform about the fundamentals related to Ecosystem.
- To develop understanding of the Environment and Environmental issues, their causes and mitigation measures.
- Finally, the application of ecological and environmental principles and guidelines to their architecture/planning projects.

Module-1 Introduction

Definition and origin of ecology, Basic concepts of ecology, Major divisions of ecology, Definition of environment, Interaction among ecological factors – light & temperature, precipitation, humidity, gases/wind, topography. Global warming & climate change, Loss of bio-diversity, Desertification, Deforestation,

Module-2 Ecosystem

Kind of ecosystem, Structure, Function and energy flow of ecosystem. Ecological succession, Ecosystem development, Climax concept.

Module-3 Soil – Edafic Factors

Definition of soil, Formation of soil, Soil profile, Classification, Soil complex, Soil depletion, degradation and conservation, relation of soil and built environment.

Module-4 Water Regimes

Water in nature, Water balance problem, Surface / ground water, Sources of water pollution, Ground water pollution, Marine pollution, Prevention control of pollution, Conservation & management, impact of human intervention on water.

Module-5 Air Pollution


Module-6 Built Environment and Ecology

Understanding the interrelationship between man, nature and built-form (in urban / rural area).

REFERENCE BOOKS


CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- To development in students communicative, writing and presentation skills.
- To enable them to record, report analyzes, evaluate and understand architecture, both in its theoretical and practical form.

Module-1  Revision

Sentence, Phrase, Clause and parts of speech - Noun-gender, Number case, Pronoun-personal’ reflexive, Emphatic, Demonstrative, Indefinite, Distributive, Reciprocal, Adjective, Article, Preposition, Conjunction and Interjection. Vocabulary, Word building and word formation, Phrases and idioms, Proverbs, Reading a dictionary, Using a thesaurus.

Module-2  Composition and Comprehension

Essay, Story and letter writing, Summarizing, Comprehension-unseen passages.

Module-3  Technical Communication


Module-4  Effective Presentation Strategies

Effective speaking, Types of speaking, Presentation with electronic aids.

REFERENCE BOOKS


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OBJECTIVES

- Introduction to basic knowledge of computers - operating system, software and hardware.
- To familiarize with software associated with text formatting, spread-sheets and presentation.
- Development of effective presentation techniques.

Module-1 Introduction

Introduction to computers and hardware’s, General idea about popular operating systems and software, Basics of Internet.

Module-2 MS Office - MS Word

Create a document that can be used by previous versions of word, Saving Options.
Create a document - Open a new document and start typing, Start a document from a template, Delete a document, Add a heading, Adjust the spaces between lines or Paragraphs, Insert a page break, Insert a picture or clip art, Insert or create a table, Headers, Footers, and Page numbers, Create a table of contents, Apply themes to Word documents, Add a cover page.
Read documents in Word - Read a document, Mark up a document, Find or look up words and phrases, Turn on or off - full screen reading view.

Module-3 MS Office – MS Excel

Getting Started with Excel - Create a workbook, Enter data in a worksheet, Format a worksheet, Format numbers in a worksheet, Print a worksheet, Create an Excel table, Filter data by using an auto filter, Sort data by using an auto filter, Apply conditional formatting, Apply data validation, Create a formula, Use a function in a formula, Chart your data, Create a macro, Create a pivot table report, Activate and use an add-in Keyboard shortcuts in Excel 2010 - Keyboard access to the ribbon, CTRL combination shortcut keys, Function keys, Other useful shortcut keys.

Module-4 MSOffice – MS Power point

Create a basic PowerPoint presentation - Name and create a new presentation, Open a presentation, Save a presentation, Insert a new slide, Add, Rearrange and delete slides, Add text to a slide, Apply a template to your presentation, Apply a theme to add color and style to your presentation, Insert a picture or clip art and insert content or insert a screenshot, Add, Change, or Delete shapes, Create a smart art graphic, Add slide numbers, Page numbers, Date and time, Create a hyperlink, Deliver and distribute your presentation, View a slide show and View your speaker notes privately, while delivering a presentation on multiple monitors, Print out a presentation, Tips for creating an effective presentation.

REFERENCE BOOKS

1. “Microsoft Office – 2013”.
2. Dr. Paolo Coletti, “Basic Computer Course Book”, Free University of Bolzano Bozen.
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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**BACHELOR OF ARCHITECTURE (B.ARCH)**

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**11 | 1ST & 2ND SEMESTER SYLLABUS**
BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – II
RAR – 201, ARCHITECTURAL DESIGN - II

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OBJECTIVES
- Introduction to human activity and spaces required for activities.
- Introduction to basic building components and their dimensions.
- To appreciate the elements in architectural design of single unit built-up structures.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Anthropometrics Studies
Studies and introduction to human dimensions and functions, Space-activity relationships, Measure drawings of simple living units.

Module-2 Living Spaces and Building Measuring, Drawing and dimensioning of simple building components. Designing for basic functions of human beings, e.g. living, eating, sleeping, cooking etc.

Module-3 Building Design Design of mono-cellular-unit/structure on a level plane, Designing of simple activity spaces, Designing of multiple but simple activity spaces involving primarily horizontal circulation.

SUGGESTED STUDIO EXCERCISES
Small space structures such as Kiosks/Small shops, Milk booths, Bus shelters, Petrol pumps, Gazebo, Florists shop, Entrance gates, Exhibition stalls, ATMs, Chowkidar’s hut etc.

REFERENCE BOOKS

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OBJECTIVES

- To acquaint the students to usage of building materials such as Timber and Hardware, Damp Proofing Courses and Cement Concrete.
- To familiarize the students with construction techniques for use of the above materials in building works and joinery in carpentry.
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Timber & Hardware
- Classification, Characteristics, Defects, Preservation.
- Hinges, Handles, Knobs, Bolts, L-drops, Locks, Stoppers, Stays, Silencers, Chain guards, Closers, Catchers, Knockers etc. in various materials.

Module-2 D.P.C.
- Asphalt, Bitumen, Synthetic, etc.

Module-3 Cement Concrete
- Types (Plain & Reinforced), Mixing, Curing, Water Cement Ratio, Qualities and Workability.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit Timber depot/Ready mix concrete plants etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop / Construction Yard Practice
- Practicing in construction yard by making the examples of brick masonry works, Carpentry works etc.

Module-5 Site Exposure
- Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS
1. To study the various tools, equipments used in masonry and carpentry works.
2. To construct examples of brick masonry works in construction yard.
3. To construct examples of timber joints in workshop and study the various hardware used in doors and windows.
4. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Brick Work
- Arches in brick and stone, Elementary principles, Centering.
- Cavity walls.

Module-7 Foundation
- Need, Design criteria, Foundation concrete, Details of simple spread foundations for load bearing walls of various thicknesses up to two brick thick.

Module-8 Timber
- Elementary carpentry, Common joints,

Module-9 Timber
- Details of framed, ledged, braced and batten doors.

Module-10 D.P.C.
- Horizontal and Vertical D.P.C.

CONSTRUCTION PLATES
1. To understand the terminology of arches and the various type of arches in brick.
BACHELOR OF ARCHITECTURE (B.ARCH)

2. To understand the application of cavity walls in brick masonry.
3. To understand spread foundation for masonry load bearing walls.
4. To understand various types of joints in timber.
5. To understand wooden Framed, Ledged, Braced and Batten Door.
6. To understand horizontal and vertical DPC for load bearing walls.

APPROACH

· The students would be familiarized with glossary of vernacular terminology as prevalent in this part of the county
· The emphasis will be on construction details as applicable to Indian conditions.
· Site visits to Timber market and Construction sites.
· Knowledge about rates of materials should be given.

REFERENCE BOOKS

5. Building Construction_Mitchell (Elementary and Advanced)

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B. ARCH. SEMESTER – II
RAR – 203, ARCHITECTURAL STRUCTURES -II

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OBJECTIVES:
- To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

Module-1 Stresses in Trusses
- Introduction, Perfect frame, Deficient frame, Redundant frame, Type of supports and their reactions, Analysis of cantilever and simply supported trusses by Analytical method, Method of sections, Graphical method.

Module-2 Torsional Stress in circular shaft

Module-3 Plain Cement Concrete
- Concrete mix, Curing and strength of concrete, Effect of temperature, Shrinkage, Fatigue.

Module-4 Deflection of Beams (Cantilever and Simply supported)

Module-5 Column and Struts
- Definition, End conditions, Buckling and critical loads, Slenderness ratio, Various column theories. Stress distribution of the section of an eccentrically loaded rectangular column, the middle third rule, Core or kernel of section (Rectangular and Circular sections).

REFERENCE BOOKS
4. Senol Utku, “Elementary Structural Analysis”.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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B. ARCH. SEMESTER – II
RAR – 204, ARCHITECTURAL DRAWING - II

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OBJECTIVES

- To familiarize the student with theoretical, practical and pictorial aspects of architectural drawing.
- To develop perception and presentation of simple architectural forms and buildings.
- To develop or upgrade an understanding about AutoCAD 2D, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)

Module-1 Metric Drawing
- Introduction, Types, Uses and advantages, Isometric, Axonometric and Pictorial view.
- Metric drawing and projection and their dimensioning.
- Metric of plane figures composed of straight lines.
- Metric of circles.
- Metric of simple and complex blocks.

Module-2 Perspective Drawing
- Introduction, Purpose and use, Differences with metric projections, Anatomy of a perspective – cone of vision, Station point, Picture plane, Eye level, Horizon line, Ground line, Vanishing point, etc., Types of perspective - One point, Two points, and Three point perspectives.
- One Point Perspective - Perspectives of simple and complex box blocks.
- One Point Perspective - Perspective of simple curved surface.
- One Point Perspective - Perspective of simple household furniture items.
- Two Point Perspective - Perspectives of simple and complex box blocks.
- Two Point Perspective - Perspective of simple curved surface.
- Two Point Perspective - Perspective of simple household furniture items.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)

Module-3 Exploring the Interface
- Installation and launching autocad, Using Application menus, Using ribbons, Expanding panels, Understanding flyouts, Pick point in the drawing area, Saving a file and working with multiple files.

Module-4 Creating your First Drawing
- Starting from scratch, Understanding paper area, Unit, Scale, Planes, Using the UCS icon, Design templates, Types and use of 2D Drafting tools, Dimensioning, 2D keyboard commands.

Module-5 Organisation of Drawing
- 2D isometric views, Materials and textures, Reference other drawing files, Link and embed data (OLE), Work with data in other formats and exporting 2D drawings to various software, Extract data from drawings and spread sheets, Access external databases.

Module-6 Effective Presentation
- Layer management, Plotting and publishing the drawing in modal space and paper space.

REFERENCE BOOKS

3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
BACHELOR OF ARCHITECTURE (B.ARCH)

6. Introducing AutoCAD and AutoCAD LT - George Omura
7. Mastering AutoCAD - George Omura
8. AutoCAD 2013 and AutoCAD LT 2013 “BIBLE” - Ellen Finkelstein

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## BACHELOR OF ARCHITECTURE (B.ARCH)

### B. ARCH. SEMESTER – II  
RAR – 205. ARTS AND GRAPHICS - II

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### OBJECTIVES
- Introduction to art and appreciation of art and its philosophies.
- Familiarization with principles and theories and graphic and architectural composition
- Development of art and graphic skills.

### SECTION – A, ARTS AND GRAPHICS

**Module-1**  
Philosophy of Art  
- Philosophy of western Art movement and their contribution to architecture  
- Renaissance - Leonardo da Vinci, Michael Angelo  
- Impressionism – Monet, Van Gough  
- Cubism – Picasso, Henry Moore.

**Module-2**  
Theory of Design  
- Unity, Order, Proportion, Form and Shape, Solids and Voids.  

**Module-3**  
Free hand drawing and Rendering Techniques  
- Exercises to learn proportion, comprehension of scale related to complete sense of composition  
- Drawings of human activity with background environment and activity areas.

### SECTION – B, PHOTOGRAPHY

**Module-4**  
Introduction to Photography  
- Development of photography, Historical background, Different types of cameras.

**Module-5**  
Photography Techniques  
- Lighting techniques, Digital photography with DSLR.

### LIST OF ASSIGNMENTS (Field Exercises & Drawings)
1. To understand the techniques of photographing various subjects - Landscape, Portrait, and Building etc.

### REFERENCE BOOKS

### CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

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OBJECTIVES

- To develop knowledge and skills related to surveying and levelling principles and practice.

Module-1  Introduction
Definition, classification, principles of surveying, Units of measurement, Scale, Signs convention.

Module-2  Chain Survey
Instruments used, Types of chain, Instruments for ranging, Setting out angles, Erecting perpendiculars, Selection of station, Methods of taking offset and Obstacles in chaining.

Module-3  Plane Table Survey
Plane table and accessories, Methods of plane table survey, Radiation, Intersection, Traversing and resection.

Module-4  Compass Survey
The prismatic compass, Surveyor compass and its construction and uses, Reduced and whole circle bearing, Magnetic declination, Effect of local attraction.

Module-5  Levelling & Contouring
Definition, Types of level, Booking and reduction of levels, Profile & cross section leveling, Errors in leveling. Characteristics of contours, Direct and indirect methods of contouring, Interpolation, Uses of contours, Calculation of area & volume.

Module-6  Theodolite
Study of instruments, Definition of different terms, Temporary adjustments, Uses, Measuring horizontal and vertical angles, Method of repetition, Extension of lines.

LIST OF ASSIGNMENTS (Field Exercises & Drawings)
1. To find out horizontal distance between two points and plotting the details on lateral side of chain line using chain, tape, ranging rod & cross staff etc.
2. Two point problem & three point problem.
3. Making L-section & Cross section of a profile.
4. Making grids on ground using theodolite & taking spot level & drawing contour lines.
5. Making a regular polygon in field and finding error of closure using different equipment.

REFERENCE BOOKS
1. Surveying Volume I & II by Dr. B.C. Punmia
2. Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
3. Surveying Volume -1 by Dr. K.R. Arora.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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### 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.

### Modules

#### Module 1: Prehistoric Age
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 with examples from Carnac and Stonehenge.

#### Module 2: Birth of Civilization
In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.

#### Module 3: Ancient River Valley Civilizations: Egypt
Landscape and culture of Ancient Egypt- history - religious and funerary beliefs and practices - monumentality tomb architecture: evolution of the pyramid from the mastaba – Great Pyramid of Cheops, Gizeh etc. Temple architecture: mortuary temples and cult temples - Temple of Ammon Ra, Karnak, Khons - Temple of Abu Simbel (Rock Cut) etc.

#### Module 4: Ancient River Valley Civilizations: Mesopotamia
Urbanization in the fertile crescent - Sumerian, Babylonian, Assyrian and Persian culture, Evolution of city-states and their character, law and writing, theocracy and architecture - Ninveh, Khorsahbad, Marie, Babylon etc. Evolution of the zigurrat - Ziggurat of Ur, Urmamu etc., Evolution of the palaces - Palace of Sargon, Khorsabad - Palace at Persepolis.

#### Module 5: Ancient Civilizations: Aegean
With reference to cities in Aegean like Troy, Sparta, Mycenae, which formed the basic of Greek civilization?

#### Module 6: Classical Period: Greece
Orders in architecture: Doric, Ionic, Corinthian - optical illusions in architecture, Domestic architecture; Public Buildings: Agora, Stoas, Theaters, Bouletrion and Stadias. Greek temple: evolution and classification- Parthenon and Erechthion, Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site.

#### Module 7: Classical Period: Rome

### Reference Books
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; CraftsmanHouse; 1994
4. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,
6. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.
BACHELOR OF ARCHITECTURE (B.ARCH)


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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – II
RAR – 208, RESEARCH / SEMINAR / WORKSHOP - I

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OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.

Module-1 Introduction
Importance of architectural research and writing.

Module-2 Technical Writing
Language, Impersonal and formal language, Elements of style, Techniques.

Module-3 Book Reviews
Basics of reviewing a book.

LIST OF ASSIGNMENTS

2. Report and presentation on ongoing architectural project.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS


CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – III
RAR – 301, ARCHITECTURAL DESIGN - III

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OBJECTIVES

- To familiarize students with a simple residential unit.
- Utilize varying methods for developing out of the box creative skills for design of small projects.
- Comprehension of arrangement / organization of spatially/ functionally similar units resulting in varied outdoor spaces.
- To assimilate the modifying spatial qualities of indoor & outdoor spaces due to varying configurations.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Study

- Lectures on Elements of Space making like Floor, Wall, Door, Window, Column, Stairs, Roofs etc.

Module -2 Learning

- Lectures on interpreting spatial configuration for specific design programme.
- Configuration / array of multiple repetitive units organized on basis of functional, geometric and visual order.

Module -3 Design

- Of simple buildings with multiple use, utilizing lessons from space-making and lateral thinking exercises.
- Understand Grouping of simple buildings integrating transforming spatial qualities of indoor and outdoor spaces.

SUGGESTED STUDIO EXCERCISES

1. Space making exercises with varying configurations of elements like columns, walls, floors, etc.
2. Design of buildings like Residence, Panchayat Bhawan, Ashrams, Artist Studio, Office cum Houses, Tourist Bungalows, club or similar projects.

REFERENCE BOOKS

1. Ching, Francis D.K. Form Space & Order.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES
- To acquaint the students to usage of building materials such as Variety of Stone, Surface finishing, Painting and Polishing& Roof coverings (conventional).
- To familiarize the students with construction techniques for use of the above materials in building works.
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES
Module-1 Stone Classification, Availability, Characteristics and Uses.
Module-3 Roof Coverings (Conventional) Clay Tiles (Country, Allahabad, Mangalore tiles etc.), Stone Slating, Shingles, Thatch.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit stone quarries and glass, ceramic, paints etc. factories for better understanding and submit report.
3. To construct examples of brick & stone masonry works in construction yard.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE
Module-4 Workshop/Construction Yard Practice Practicing in construction yard by making the examples of stone masonry works, plastering, jointing, pointing and painting, timbering of shallow trenches and doorsamples.
Module-5 Site Exposure Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS
1. To study the various tools, equipments used in stone masonry finishing works.
2. To study the various tools, equipments used in glass works.
3. To study the various tools, equipments used in painting works.
4. To prepare scaled model of door in workshop.
5. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY
Module-7 Door (Timber) Types and details of Panelled door shutters and Mosquito proof doorshutter.
Module-8 Window / Ventilator (Timber) Types of Windows / Ventilators and details of glazed window and ventilator shutters and frames.
Module-9 Roof Terracing Complete process of laying of terracing with provisioning of Gola & Khurra etc. - Lime concrete, Mud phaska with brick tiles, Brick coba.
Module-10 Temporary Timbering Timbering of shallow trenches.
BACHELOR OF ARCHITECTURE (B.ARCH)

CONSTRUCTION PLATES
1. To understand square stopped ends of Random, Course and Ashlar stone masonry.
2. To understand variety of Panelled door shutters and their details in timber.
3. To understand Mosquito proof door shutter and its details in timber and jaali.
4. To understand variety of windows & ventilators and the details of window frame and glazed shutter in timber and glass.
5. To understand the application of roof terracing with various details.
6. To understand Timbering of shallow trenches in various soil types.

APPROACH
- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian climatic conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS
5. Building Construction. Mitchell (Elementary and Advanced)
9. Mitchell’s Structure & Fabric-II

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B. ARCH. SEMESTER – III
RAR – 303, ARCHITECTURAL STRUCTURES - III

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OBJECTIVES:
- To understand the analysis of indeterminate structures and their application in structural design and analysis.

- Introduction, Strain energy stored due to axial loading and due to bending.

Module-2 Statically Indeterminate Structures
- Introduction, Degree of indeterminacy, External and internal indeterminacy, Calculation of degree of indeterminacy for beams and frames.

Module-3 Fixed & Continuous Beams
- Fixed beams - Introduction, B.M. Diagram for a fixed beam for various loading, Effects of sinking of support, advantages and disadvantages of fixed beams.
- Continuous beams - Introduction, Clapeyron’s theorem of three moments for two to three span of continuous beam, Effects of sinking of support.

Module-4 Moment Distribution Method
- Basic Proposition, Relative stiffness, Analysis of continuous beams and portal frames for simple loading.

Module-5 Slope Deflection Method
- Introduction, Basic concepts, Basic formulae, Application to analyse Continuous beams and Portal frames for simple loadings.

REFERENCE BOOKS
4. Senol Utku, “Elementary Structural Analysis”.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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B. ARCH. SEMESTER – III
RAR – 304, ARCHITECTURAL DRAWING - III

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OBJECTIVES
- To develop greater perception of complex Architectural forms and buildings.
- To develop the skill of making perspectives of complex buildings and Rendering them in different media.
- To develop or upgrade an understanding about AutoCAD 3D, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)
Module-1 Shades and Shadows
Values in Shades and shadows.
Constructing plan shadows (point, line and plane).
Constructing shadows in elevations (point, line and plane).
Short –cut methods for Constructing shadows.
Presentation techniques in Sciography.

Module-2 Presentation
Introduction to different textures and finishes in plan and elevation.
Graphical representation of furniture, automobiles, human figure etc. in plans and elevation and 3-Dimension.
Preparation of presentation drawings of small buildings, through Plans, Elevation, Section, Site plan etc., using various rendering techniques and media, incorporating sciography for creating three dimensioned effect.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)
Module-3 Introduction to 3D Using SketchUp
Understanding the XYZ axis. Selecting toolbars. Applying templates.

Module-4 Modelling & Editing 3D Models

Module-5 Understanding Material Editing

Module-6 Introduction to Animation

REFERENCE BOOKS
**BACHELOR OF ARCHITECTURE (B.ARCH)**

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B. ARCH. SEMESTER – III
RAR – 305, ARTS AND GRAPHICS - III

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OBJECTIVES
- To develop an appreciation of Indian Arts & Crafts among the Students.
- To strengthen the skill of architectural rendering.
- To develop the skills to design smaller elements of building.

SECTION – A, ARTS AND GRAPHICS
Module-1 History of Indian Art
A brief introduction to the History of Indian Art,
Module-2 Techniques & Mediums of Art
Learning of wood cut, Lino cut, Serigraphy (Screen printing).
Module-3 Design of objects
Designing small scale models of window grill, railing and balustrades, jaali in suitable materials (Steel, Concrete etc.)

REFERENCE BOOKS
1. ABC of Indian Art- J.F.BLACKER.
2. A concise History of Indian Art - ROY C. CRAVEN.
3. Maurya and Post Maurya Art- NIHAR RANJAN RAY
4. The Story of Indian Art- S.K. Bhattacharya

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**BACHELOR OF ARCHITECTURE (B.ARCH)**

**B. ARCH. SEMESTER – III**
RAR – 306, ARCHITECTURAL SERVICES – I (WATER SUPPLY & SANITATION)

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**OBJECTIVES**
- To understand the basic principles of water supply and sanitation.
- To make them enable to draw the piping system (pipe above ground and underground) for different types of buildings.
- To familiarize the student with plumbing bye laws as per BIS.

**SECTION – A, WATER SUPPLY**

**Module-1 Water Supply**
- Need to protect water supply, Requirements of water supply to different types of buildings.
- Sources of water supply, Quantity and quality of water.
- Conveyance and distribution of water, Overhead tank, Underground tanks, Pipe appurtenances.
- Hot and cold water supply system in a low rise and high rise buildings.
- Distribution system in campus, Pipes their size, Jointing and different fittings.

**SECTION – B, SANITATION**

**Module-2 Sanitary Engineering**
- Purpose and principles of sanitation, Collection and conveyance of waste matter.
- Quantity and Quality of refuse, Design and construction of sewer’s and sewer appurtenances.
- Garbage and sewage disposal.
- Roof and surface water drainage. Rain water storage and water harvesting principles and methods.
- Sanitary appliances, Traps their variety, Pipes and joints, Sanitary pipes works below and above ground level.

**SECTION – C, APPLICATION**

**Module-3 Plumbing & Sanitary Drawing**
- The plumbing and sanitary system for individual spaces e.g. kitchen, toilet, wash area, utility etc.
- The plumbing and sanitary system for a residence.

**REFERENCE BOOKS**
2. The construction of building by Barry-vol.-5.
5. Water supply & sanitary Engineering by S. K.Hussain.

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B. ARCH. SEMESTER – III
RAR – 307, HISTORY OF ARCHITECTURE – II

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OBJECTIVES
- To inform about the development of Indian architecture and its contextual and traditional aspects.
- 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 various aspects of Hindu architecture.
- To comprehend and analyze spatial character, scale, and structure through historical and traditional built heritage.
- To comprehend and relate to the theoretical basis of historical and traditional Hindu architecture.

Module-1 Indus Valley civilization
Town planning principles, cultural ethos, economy exemplified with examples from Mohenjodaro and Harappa.

Module-2 The Aryan civilization
With its emphasis on the Vedic town plan, its motifs and patterns. The brick altars and their significance.

Module-3 Buddhist Architecture
Typology of lats, eddicts, stupas, viharas, and chaityas, both in rock-cut or otherwise. The techniques used for rock-cut spaces and free standing built masses. The spatial and functional connotations.

Module-4 Buddhist Theory
The Buddhist philosophy and its imprint in built space.

Module-5 Hindu Architecture- Indo-Aryan
The evolution of the temple form, evolution of the shikhara in north India. The three schools of architecture—the Gujarat, the Khajuraho, and the Orissan styles. Comparison in spatial attributes, scale and detail.

Module-6 Hindu Architecture- Dravidian
The evolution of the vimana and the contributions of the Chalukyas, the Pallavas, the Pandyas and the Cholas. The contributions of the Nayaks to the temple cities. The city morphology, spatial diversity and planning criteria.

Module-7 Hindu Theory
Hindu philosophy and its imprint in temples/traditional houses and other built structures. Mandala and the geometric grid in temple plans. The proportional theory in temple elevation.

Module-8 Jain Architecture
The temple cities of Palitana, Mount Abu and Girnar.

Module-9 Jain Theory
The Jain philosophy and its imprint in built form. The Jain mandalas.

Module-10 Measured Drawing
Measured Drawing of a historical precinct.

REFERENCE BOOKS
2. Percy Brown, Indian Architecture (Buddhist and Hindu period), D.B.Taraporewala Sons & co Pvt. Ltd. 1965
3. Volwahsen, Andreas, Living Architecture
BACHELOR OF ARCHITECTURE (B.ARCH)


CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.

Module-1 Introduction
Aspects of Analysis of an Architectural project

Module-2 Technical Writing
Critical Appreciation of a Project: Analyzing on the basis of site, Built Form and Space, Spatial Organization, Materials and Techniques, Elements and Special Characteristics, Activity Pattern.

Module-3 Book Reviews
Review of Book with presentation of the précis.

LIST OF ASSIGNMENTS
2. Report and presentation on ongoing architectural project.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS
2. Fundamentals of Design

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- Acquainting the students with human thermal comfort as an essential function of a building, its analysis & use in Architecture.
- To familiarize students with the elements constituting climate and their role in creating responsive designs.
- Understanding the characteristics of varied tropical climates and expected responses of buildings in specific climate types
- To utilize existing traditional/vernacular/ historical structures in the city as case study to learn the various attributes of climate & the desirable responses.

LIST OF ASSIGNMENTS (Field Exercises & Drawings)
1. Understanding tools & instruments utilized for measurement of climatic elements using the climatology lab & meteorological department.
2. Documenting local case studies of vernacular/ traditional/ historical buildings for understanding their responses to prevailing climate.
3. Collecting data of temperature, humidity, radiation light & wind for specific cities and making solar charts, bio-climatic charts & Mahoney tables for the same.

REFERENCE BOOKS
1. Koinesberger,O. Tropical climate.
4. Olgyay, V. design with Climate.
5. Works of Architects like HasanFathy, B.V. Doshi, Charles Correa, Ken Yeang, Sanjy Puri, among others to understand responses of varied designers to the existing environment.

**CRITERIA FOR ASSESSMENT OF SESSIONALS**

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IV
RAR – 401, ARCHITECTURAL DESIGN - IV

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OBJECTIVES
- To understand the role of climate and environment as a context in shaping building design.
- To comprehend the interpretation of prescribed environmental directions / norms for a given place in building forms.
- Studying the vernacular architecture of varied climatic zones to examine their response to the existing conditions.
- Analysing the spatially rich vernacular architecture especially of the indian subcontinent to derive useful learnings for prevailing climate & region.
- The design studio should be linked with the simultaneous theory subject of vernacular architecture.
- Recognizing the relevant materials & building techniques suitable for that region & explore their applicability in design.
- Learn building on sloping sites or with unique topography.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Understanding climatic zones
Lecture on the varied climate zones especially in the Indian sub-continent including examples of environment responsive designs.
Establishing design criteria for various climate types.

Module-2 Lessons from Vernacular
Lectures on concept of vernacular & lessons to be learnt.
Detailed study of a vernacular settlement remarkable for its spatial quality, material, and construction technology, characteristic for that region & climate.
Analysis of the selected settlement in light of their spatial roles, human scale, activity, space & form and consequently the design considerations.
Lectures on the spatial attributes of the resultant open & built of the vernacular and lessons to be learnt from the study & their juxtaposition.

Module-3 Design of climate responsive buildings
Designing a multi-functional building in a typical climate zone utilizing the developed design criteria.

Module-4 Design on sloping site
Design exercise on sloping terrain with specific orientation & climatic conditions.

SUGGESTED STUDIO EXCERCISES
1. Studies of various climates; responses of vernacular/ traditional in those conditions & establishing design criteria.
2. Study tours to relevant rural/urban destinations for primary documentation.
4. Design on sloping site with unique topography for structures like a simple guest house, tourist complex or museums.

REFERENCE BOOKS
3. Olgyay, V. Design with Climate.
5. Works of Architects like Hasan Fathy, B.V. Doshi, Charles Correa, Ken Yeang, among others to understand responses of varied designers to the existing environment.
BACHELOR OF ARCHITECTURE (B.ARCH)

6. Rappoport, Amos. House Form & Culture
7. Oliver, Paul. Shelter & Form

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IV
RAR – 402, CONSTRUCTION & MATERIALS – IV

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OBJECTIVES

- To acquaint the students to usage of building materials such as Timber products, Glass, Ceramics and Adhesives.
- To familiarize the students with construction techniques for use of the above materials in building works.
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Timber Products
Variety of Plywood, Ply-board, Block board, Particle board, Wood wool cement board, Fiberboard, Compressed straw board, Cement fiberboard, Mineral fiber board, Veneers, Laminates etc.

Module-2 Glass & Ceramics

Module-3 Adhesives

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit timber products, adhesives factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice
Practicing in construction yard / workshop by making the examples of partitions and paneling samples.

Module-5 Site Exposure
Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in roof laying works.
2. To construct examples of partition and panelling in construction yard / workshop.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Door (Timber Products)
Types and details of Flush door shutter with finishes.

Module-7 Door (Operational Mechanism)
Complete understanding of operational mechanism (automatic and manual) of variety of Sliding door shutters, Sliding-folding door shutters and Revolving doors shutters.

Module-8 Partition
Terminology, Partitioning methods with use of different materials e.g. Timber and Timber Products, Clay and Terracotta Brick / Block, Pre-cast solutions.
BACHELOR OF ARCHITECTURE (B.ARCH)

Module-9  Panelling
(Timber & Timber Products)

Concrete Block, Wood Wool Cement Board, Compressed Straw Board, Glass and Glass Brick.

Terminology, Panelling methods with use of materials e.g. Timber and variety of timber products.

Module-10 Brick Work Temporary
Constructions

Shoring (Raking, Flying and Needle).
Underpinning.

CONSTRUCTION PLATES

1. To understand the application of variety of flush door shutters and their details.
2. To understand the application of variety of sliding door shutters and their details.
3. To understand the application of variety of sliding folding door shutters and their details.
4. To understand the application of partitions in building interiors using timber, timber products and glass etc.
   along with their details.
5. To understand the application of panelling in building interiors using timber and timber products along with their
details.
6. To understand the application of temporary construction in buildings.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

5. Building Construction Mitchell (Elementary and Advanced)
9. Mitchell’s Structure & Fabric-II
   New Delhi, 2011.
17. Engineering Material-Roy Chowdary

CRITERIA FOR ASSESSMENT OF SESSIONALS

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#### B. ARCH. SEMESTER – IV

RAR – 403, ARCHITECTURAL STRUCTURES - IV

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#### OBJECTIVES:
- To understand the basic principles of R.C.C. structures and soil mechanics and their application in structural design and analysis by LIMIT STATE METHOD.

**Module-1 Introduction to Design Methods**

**Module-2 Introduction (Limit state design method)**
- Understanding of Limit state, Characteristic strength and characteristic load, Design values, Partial safety factors, Factored loads, Stress strain relationship for concrete and steel, Yield stress, Provisions of IS codes, Loads and Load combination

**Module-3 Detailing of Reinforcement**
- Introduction, Requirements of good detailing, Nominal cover to reinforcement, Spacing of reinforcement, Reinforcement requirements, Reinforcement splicing, Anchoring reinforcing bars in flexure, Curtailment of tension reinforcement in flexural members, Bar bending schedule

**Module-4 Analysis & Design of Singly & Doubly Reinforced Rectangular sections and Flanged Beams section**
- Introduction, Bending of beam assumption, Moment of resistance, Modes of failure, Maximum depth of neutral axis, Limiting values of tension steel & moment of resistance

**Module-5 Shear and Development Length**
- Introduction, Shear stress, Diagonal tension, Shear reinforcement, spacing of shear reinforcement, Development length, Anchorage bond, Flexural bond

#### REFERENCE BOOKS
1. Ashok kumar jain “Reinforced concrete” Limit State design.
4. Senol Utku , “Elementary Structural Analysis”.
7. P.C. Varghese, “Advanced Reinforced Concrete Design”.
8. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K. Jain “R.C.C. Designs”

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B. ARCH. SEMESTER – IV
RAR – 404, ARCHITECTURAL DRAWING - IV

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OBJECTIVES
- To develop greater perception of complex Architectural forms and buildings.
- To develop the skill of making perspectives of complex buildings and Rendering them in different media.
- To develop the skills free hand sketching.
- To develop or upgrade an understanding about Autodesk Revit Architecture, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)
Module-1 Sciography  
Shades and Shadows of objects and building elements cast on irregular surfaces, rendered in suitable medium.  
Shades and shadows in perspective views for exteriors.  
Shades and Shadows cast by point source of light in interiors.

Module-2 Perspective Drawing  
Two-point exterior perspective views, using measure point method, of simple & medium sized buildings- isolated or in-group, showing shades and shadow using different media like-Pencil, Pen-Ink, Water Colour, Poster, and Airbrush etc.  
One point perspective drawing of interiors rendered in different media.  
Two point perspective drawing of interiors rendered in different media.  
Introduction to short cut methods in perspective drawing.  
Free hand perspective.  
Other innovative methods of perspective presentation techniques should be encouraged.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)
Module-3 Getting Started Revit Architecture  
Introduction, Modifying the view, Common tasks, System options, File locations, Spelling options, Settings, Keyboard shortcuts, Levels and grids, Zooming, Steering wheels.

Module-4 Building the Model and Modify  
Walls, Doors, Windows, Components, Architectural columns, Roofs, Ceilings, Doors, Openings, Model text, Model lines, Compound structure, Sloped surfaces, Stairs, Ramps, Railings, Adding and modify curtain wall.  
Attaching wall to roof, Modifying the entry deck, Modifying the roofs.

Module-5 Presentation  
Dimensions, Keynotes, Tags, Symbols, Adding legend views, Creating a detail callout, Adding filled and masking regions, Using detail components, Creating sheet, Sheet properties

REFERENCE BOOKS
5. Autodesk Revit Architecture 2012: No Experience required – Eric Wing
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IV
RAR – 405, ARTS AND GRAPHICS - IV

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OBJECTIVES

- To develop an appreciation and understanding of Indian contemporary art and trends.
- To develop skills of making mural, sculpture, furniture, pottery and fountains from fiber glass, mild steel, cast iron, stainless steel, wood, plaster of paris, terracotta, cement concrete and ceramics etc.
- To develop skills of graphic printing techniques.

SECTION – A, ARTS AND GRAPHICS

Module-1 History of Art
A brief introduction of Renaissance in Indian Art i.e. 19th century and Post-independence art of India.

Module-2 Indian Artists
A brief overview of arts and artist in India; Abanindra Nath Tagore, Nand Lal Bose, Jamini Roy, Amrita Sher Gill, M.F. Hussain, Satish Gujral and S.H.Raza etc.

Module-3 Design
Designing and live execution of murals, sculptures, furniture, pottery using materials like clay, wood, terracotta, Acrylic fiber sheet, Scrap metal, etc.

REFERENCE BOOKS
1. ABC of Indian Art- J.F.BLACKER.
2. A Concise History of Indian Art - ROY C. CRAVEN.
3. Maurya and Post Maurya Art- NIHAR RANJAN RAY
4. The Story of Indian Art - S.K. Bhattacharya

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IV
RAR – 406, ARCHITECTURAL SERVICES – II

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OBJECTIVES
- To understand the basic principles of physics of electricity and light.
- To make them enable to draw the electrical layout with appropriate cross section of wires and illuminance calculations for residences.
- To know the characteristics and applications of the different types of modern lamps and luminaires.
- To familiarize the student with electrical bye laws as per NEC/BIS.

SECTION – A, ELECTRICAL
Module-1 Electrical

**Introduction**
Terminology and architectural symbols (as per NBC/NEC) for electric installations in buildings.

Need to generate and save electricity, transmission and distribution of electricity (single and three phases), procuring service connection.

Familiarization to various lighting accessories, wires and cables, metering, distribution panels / boards etc. for single and three phase supply.

Guidelines for installation of fittings.

**Design of simple electrical circuits**
Introduction to simple light and fan circuits.

System of connection of appliances and accessories e.g. series and parallel connection, joint box system, looping-in system.

**Systems of wiring**
Basic considerations.

Various types of internal wiring systems e.g. cleat, casing and capping, batten and conduit (surface & concealed).

**Protection of electrical installation and human life**
Basic considerations.

Protection against excess current, short circuit earth fault and protection against electric shock.

Introduction to various types of protection devices e.g. switches, fuses and circuit breakers.

Need for earthing of domestic fittings and appliances, earthing and its relation with soil resistivity, earth electrodes, earth wires.

Load assessment and selection of appropriate cross section of the conductor.

SECTION – B, ILLUMINATION
Module-2 Illumination

**Introduction**
Terminology and unit.

Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light. Electromagnetic spectrum and visible radiation.

**Illumination**
Types of illumination schemes e.g. Ambient, Task, Focal and Decorative etc.

Design considerations for illumination Schemes.

Methods for lighting calculation – Watts per square meter, Light flux and Point to point method.
**BACHELOR OF ARCHITECTURE (B.ARCH)**

Sources of light (Electrical) –
Familiarization and understanding of electrical sources of light e.g.
- Thermal radiators - Incandescent, Halogen.
- Discharge lamps - Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon), High pressure (mercury, metal halide, sodium).
- New technologies - LED, Fiberoptics.

Luminaries –
Types of Luminaries – Indirect, Semi-indirect, General diffusing, Semi-direct and Direct.

**SECTION – C, APPLICATION**

**Module-3  Electrical Drawing**
The understanding of electrical needs for individual spaces e.g. Living room, Dining room, Bed room, Kitchen, Toilet, Staircases, and Corridors etc.
The electrical layout drawing for a residence.

**Module-4  Field / Market Surveys**
Familiarization to types of electrical luminaries available in market, manufactured by various brands e.g. Recessed mounted luminaries, Spot / Projectors, Surface mounted luminaries, Decorative luminaries, Pendant luminaries, Free-floor-standing luminaries, Up lights, Trunking lighting systems, Down Lights.

**REFERENCE BOOKS**

**CRITERIA FOR ASSESSMENT OF ASSIGNMENTS**

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OBJECTIVES

- To inform about the development of Western architecture from 1st century onward and its contextual and ecclesiastical aspects.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion, climate and technology.
- To gain knowledge of the development of architectural form with reference to technology, style and character in western architecture.
- To comprehend and analyze spatial character, scale, and structure through historical and traditional built form.
- To comprehend and relate to the theoretical and philosophical basis of western architecture.

Module-1 Early Christian Architecture
Development of early church from Roman basilica. The concept of center and path of Christianity manifested through centralized and longitudinal church. Interiority of churches and the articulation of interiors to create spiritualized space. Study of different basilica churches in Italy.

Module-2 Byzantine Architecture
Centralization in Byzantine churches. Centrality and interiority of both cross-domed and cross in square planned church. Indistinct exterior of churches and the domed ‘heavenly’ interior. Construction of dome over polygonal compartments through the use of pendentives. Study of important churches in Constantinople.

Module-3 Romanesque Architecture
Massiveness and verticality of medieval churches. Combination of the five towered structures and longitudinal basilica. Gradual integration of tower from early to later examples. Integration of centralized and longitudinal plans. Articulation of external wall like arcaded interiors resulting in dematerialization of exterior. Study of important cathedrals and churches from Italy and France.

Module-4 Gothic Architecture

Module-5 Renaissance Architecture
Break with medieval churches for sources from Roman antiquity. Spatial centralization through simple addition of independent spatial elements. Use of elementary geometrical forms unified through symmetry and simple mathematical ratios. Reintroduction of anthropomorphic Classical Orders. Study of palazzos and development of centralized church form through specific examples from Italy.

Module-6 Mannerism
Conflict and tension in Mannerism in place of harmony and order of Renaissance. Dynamic interplay of contrasting elements as against static addition of independent units of Renaissance church. Interplay between manmade and nature in villas. Dynamism of urban spaces. Centralized longitudinal and the elongated central church plans. Study of important villas, churches and urban spaces in Italy.

Module-7 Baroque Architecture
Dynamism and systemization of Baroque architecture. Vitality and spatial richness with underlying systematic organization. Space as constituent element of
BACHELOR OF ARCHITECTURE (B.ARCH)

architecture, as a complex totality and indivisible figure, comprising of interacting spatial elements based on inner and outer forces. Sensitivity to effects of texture, color, light and water. Study of important urban spaces and churches in Italy and Germany.

REFERENCE BOOKS
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
7. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
9. Christian Norberg-Schulz, Meaning in Western Architecture, Praegur, 1975

CRITERIA FOR ASSESSMENT OF SESSIONALS

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## OBJECTIVES
- Understanding basic principles of any research with special reference to architectural research and applications.

## LIST OF ASSIGNMENTS
1. Review of an architectural book/books prescribed by the assigned teacher.
2. Referencing assignments based on the book / topic assigned by the faculty member student is assigned with.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

## REFERENCE BOOKS

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OBJECTIVES

- To highlight the role of Vernacular Architecture & lessons useful in contemporary context
- To expose students to the varied vernacular and traditional architecture of India and the world.
- To connect the aspect of climate responsiveness and environment suitability of vernacular architecture to the ongoing design studio.

Module-1
Introduction to Vernacular
Definitions; Relevance; Role & scope of Vernacular Architecture; issues of concern in present day architecture and causative forces of the vernacular form.

Module-2
Lessons from Vernacular Architecture
Brief overview of the varied learnings from vernacular including Sense of Place, Spontaneity & variation, Control, Open Ended form Relationship, Symbols & Meanings.

Module-3
Case/ Literature Studies
Study of vernacular and traditional architecture of India and the world specifically in varied climatic zones.

Module-4
Study of an existing Settlement
Study of an existing settlement in the vicinity for on-site comprehension of afore-mentioned characteristics and developing a design criterion for the ongoing design exercise.

REFERENCE BOOKS:
6. Architecture Without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky

CRITERIA FOR ASSESSMENT OF SESSIONALS

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**OBJECTIVES**

- Understanding basic structure forms in relation to space and materials.
- To understand the different structural systems and their mechanism/logic.
- To understand the constraints and possibilities of designing with the range of structural systems available.
- To employ and integrate these structure systems into the design ideology, especially in proposals requiring large spans.
- Field trips to relevant sites shall be compulsory for all assignments.

**Module-1 Introduction**

Acquainting with the various structural systems and their relation to form, materials and function.

**Module-2 Types of Structural Systems**

Through seminars, drawings and models, a study of different structural systems, their mechanism of load bearing, adaptability, efficiency and limitations.

- **Trabeated:** Brick and stone, columns and beams slabs, one way and two way, coffers.
- **Arcuated:** Corbelled, Radiating Arch, Vault and Dome, Squinch and Pendentives.
- **Vector Structures:** Trusses and space frames.
- **Form Structures:** Folded slabs, Shells, Hyperbola-paraboloid.
- **Tensile:** Tents, Cables and Pneumatic vis-à-vis materials and plan shape/s

It should be noted that emphasis would be on the design parameters and graphical presentation of systems rather than their structural analysis.

**Module-3 Design Proposal**

Design of functional spaces that incorporate large span structures, repetitive modules, medium column free spans and multi-storied aspects that use the varied structural systems. For example factories, institutes, auditoriums, stadium, commercial malls and other campus designs etc.

**Module-4 Integration of design with structural system**

Development of the design proposal to the stage of integrating structure system necessary for the execution of the project and making relevant drawing for the same.

**SUGGESTED STUDIO EXCERCISES**

1. Literature study and Case Study of different structural systems as used in famous buildings of the world.
2. Presentation of the system with scaled models or actual structures in construction yard.
3. Design of buildings like Stadia, auditorium, Petrol Pump, Factories, Museums, Malls, and buildings using varied structural systems.
4. Study tours to relevant urban destinations for primary documentation.

**REFERENCE BOOKS**

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 502,CONSTRUCTION & MATERIALS – V

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OBJECTIVES
- To acquaint the students to usage of building materials such as Metals (Ferrous), Floorings.
- To understand the use of these building materials in building works.
- To understand the use of the metal doors/windows in existing and new construction.
- To familiarize the student with the building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Metals (Ferrous)
Ferrous-Iron (Pig, Cast & Wrought).
Variety of Mild Steel sections – Sheets (plain & corrugated), Flats, Bars (round & square), Angles (Equal and Unequal), R.S. Sections (I beams, Channels, Tees).
Hollow Tubular sections available for application in building industry.
Stainless steel and Alloys.

Module-2 Floor & Floor Finishes
Brick, Cement Concrete, Stone, Terrazzo, Chequered Tile, Ceramic Tile, Vitrified Tiles, Wooden.

Module-3 Reinforced Brick Work
Types, Mixing, Curing, Water Cement Ratio, Qualities and Workability.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit assembly workshops/shops etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice
Practicing in construction yard / workshop by making the examples of metal joinery, fixing of flooring, fixing of dado, timbering of shallow trenches and doorsamples.

Module-5 Site Exposure
Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS
1. To study the various tools, equipments used in structural steel works.
2. To construct examples of structural steel works in construction yard.
3. To survey construction work on site and submit report. To construct examples of reinforced brickwork and variety of flooring in construction yard.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Structural Steel Works
Typical metal joinery - Mechanical (riveted & bolted), Soldering and Brazing and welding.
Detailing of structural steel work – Beam to Column joint, Beam to Beam joint, Column Splice, Column Base, Roof Truss to Column Joint.
Steel Stairs.

Module-7 Doors & Windows (Metals)
Mild steel L and Z section, Pressed steel section.

Module-8 Shutters (Operational Mechanisms)
Complete understanding of operational mechanism (automatic and manual) of variety of Rolling shutters and Collapsible shutters.

Module-9 Reinforced Brickwork
Reinforced brick piers, lintels, slabs and projections.
Module-10 Floor/Dado/Skirting

Complete process of laying of floor and skirting - Brick, Cement Concrete, Mosaic and Terrazzo floors.
Laying and fixing of Stone slabs, Chequered Tile, Ceramic tiles, Vitrified tiles and Wooden (parquet and plank) on subfloors and walls.

CONSTRUCTION PLATES
1. To understand the application of structural steel works in buildings.
2. To understand the application of metal doors and windows in buildings.
3. To understand the application of metal shutters (Rolling) in buildings.
4. To understand the application of metal shutters (Collapsible) in buildings.
5. To understand Reinforced brick piers, lintels, slabs and projections.
6. To understand laying of above mentioned floors and fixing of above tiles on floors and walls.

APPROACH
• The students would be familiarized with vernacular terminology as prevalent in this part of the country.
• The emphasis will be construction details as applicable to Indian conditions.
• Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS
5. Building Construction. Mitchell (Elementary and Advanced)
9. Mitchell’s Structure & Fabric-II
17. Engineering Material-Roy Chowdary

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)  

B. ARCH. SEMESTER – V  
RAR – 503, ARCHITECTURAL STRUCTURES - V

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OBJECTIVES:

- To understand the various structural elements and their application in structural design and analysis by **LIMIT STATE METHOD**.

Module-1  
**Analysis and Design of R.C.C. Slab**  
Analysis and Design of one way, two way and flat slabs and detailing of its reinforcement.

Module-2  
**Analysis and Design of R.C.C. Beam (Continuous)**  
Analysis and Design of R.C.C. continuous beam and detailing of its reinforcement.

Module-3  
**Analysis & Design of Portal frame (R.C.C.)**  
Analysis and design of portal frame (Single bay, Single storey) with fixed and hinged base, in R.C.C.

Module-4  
**Analysis and Design of R.C.C. Stairs**  
Introduction, Type of stairs, Effective span of stairs, Loading on stairs, Analysis and design of stairs (dog legged with waist slab) and detailing of its reinforcement.

Module-5  
**Elementary Soil Mechanics**  
Classification of Soil, Properties of Soil, Safe bearing capacity, Active & Passive earth pressure.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student’s exposure to practical aspects of design.

REFERENCE BOOKS

3. P.C. Varghese, “Advanced Reinforced Concrete Design”.
4. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C. Designs”

CRITERIA FOR ASSESSMENT OF SESSIONALS

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TOTAL 35
OBJECTIVES

- To initiate students into theory and practice of Interior Design.
- To familiarize students with modern materials and techniques useful for furniture and interior design.
- To appreciate early interventions in design of furniture

Module-1 Introduction to Interior Design
Definitions related to interior design;
Review of enclosing elements like walls, floors, ceilings, openings, staircases, furniture& design elements such as color, light textures in interior spaces.
Principles of interior design.

Module-2 History of Interior Design & Furniture Design
Concise understanding of evolution from ancient to modern, post-modern ideologies to contemporary (Egyptian, Greek, Roman, Gothic, Baroque, Renaissance, Arts and Crafts Movement, Art Nouveau, De Stijl, Modernism, Post Modernism and Contemporary)
Understanding role of materials and technology in their transformation and various theories associated in their evolution.

Module-3 Study of Materials, Finishes & their applications in Furniture & other Interior Elements
An in-depth understanding of the characteristics and workability of various materials used in interiors.
Their classification could be on basis of elements of usage (floors, ceilings, walls, doors, windows and fabric/upholstery) or materials based like wood, metal plastics and their variants.

Module-4 Understanding innovation in Furniture & Interior Design
Modern materials, Modular furniture, Interior landscaping, Fittings & fixtures.

Module-5 Analysis & Design of Furniture
Analyzing existing designs of selected furniture on basis of ergonomics, user type, economics, material, joinery and maintenance to ascertain their suitability.
Design furniture for specific use complying to the aforementioned formulated design criteria.
Build scaled models of the designed furniture for better understanding of working and materials.

Module-6 Analysis & Design of Small Interior spaces
Analyse small selected interior spaces like study, bedroom, executive/architect office, retail outlet, conference & waiting lobby including toilets and kitchens in detail, for varied aspects like function, ergonomics, materials and establishing detailed design criteria.
Design of selected small interior spaces on specific sites/locations based on formulated design criteria using modern design methodologies.
Develop design details of the afore-designed projects for their furniture and finishing.

APPROACH
1. Course should be covered through lectures and seminars by the students.
2. Attempts should be made for a thorough study of materials and techniques used in interiors and their applicability.
3. Scaled models of design exercises should be encouraged.
4. Regular studio work for total grasp of the subject is essential.
5. Report making for study of furniture and craft styles in India should be done.
BACHELOR OF ARCHITECTURE (B.ARCH)

REFERENCE BOOKS
3. Massey, Anne. Interior design since 1900.
4. Litchfield, Fredrick. Illustrated History of Furniture from the earliest to the present time.
5. Fiell, Charlotte and Peter. 1000 chairs

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 505, WORKING DRAWINGS & DETAILS

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OBJECTIVES
- To understand and making drawing/ details necessary for final execution of a project.
- To integrate all services and structure system in the working drawing project.

Module-1 Working Drawings
Making complete set of working drawings for the residence or any other project designed by the student. The drawings to incorporate all necessary information complete with schedule and all specifications. The Working Drawings to include:
1. Site plan.
2. Foundation layout with details of foundations and D.PC.
4. First Floor Plan.
5. Terrace Plan
6. Sections
7. Elevations.

Module-2 Services Drawings
Making complete set of services drawings for the above said project. The drawings to incorporate services details complete with schedule and all specifications. The Services Drawings to include:
1. Electrical Layout.
2. Plumbing Layout.
4. Drainage Layout.
5. Rain Water Disposal / Harvesting Layout and Details.
6. Toilet details.
7. Kitchen / Pantry Details.

Module-3 Working Details
Making complete set of working details for the above said project. The drawings to incorporate details complete with schedule and all specifications. The Working Details to include:
1. Doors and Windows Drawings and Details.
2. Staircase Details including railings.
3. Details of Grills, Parapet or railings.
4. Typical wall section showing foundation, DPC, skirting, sill, lintel, slab and terracing details.

Module-4 Finishing Drawings
Making complete set of finishing drawings for the above said project. The drawings to incorporate finishing details complete with schedule and all specifications. The Finishing Details to include:
1. Doors and Windows Frame and Shutter details.
2. Flooring & Skirting pattern and fixing details.
3. Dado / Wall tile pattern and fixing details.
4. Wall Cladding pattern and fixing details.
5. Plaster Pattern with Colour schemes.

SUGGESTED STUDIO EXCERCISES
1. Complete set of working drawings as suggested above for a medium sized residence or any other project designed by the student.
BACHELOR OF ARCHITECTURE (B.Arch)

APPROACH
1. Course should be covered through lectures and studio exercises.
2. The students would be familiarized with vernacular terminology as prevalent in this part of the country.
3. The emphasis will be working drawings (as per various codes) and construction details as applicable to Indian conditions.
4. Site visits to understand the importance of working drawings and market surveys to understand modern materials and their manufacturers’ details will be an integral part of sessional work.

REFERENCE BOOKS
- Various codes prevalent.

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 506, ARCHITECTURAL SERVICES – III (AIR CONDITIONING SYSTEMS & LIFT SERVICES)

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OBJECTIVES
- To develop an understanding of the advanced building services such as Air conditioning and lifts and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

SECTION – A, AIR CONDITIONING SYSTEMS

Module-1 Introduction & Principles
Fundamentals of Air Conditioning System Design.
Building Plans, Drawings, and Schematics.
Refrigeration Cycle, Psychometric chart, Cooling load for air conditioning.

Module-2 AC systems
Comfort cooling systems & their working - Unitary air conditioning- window ac & split ac. Package ac system. Evaporative cooling systems.
Central air conditioning their parts- A.H.U., Cooling plant, Cooling tower.

Module-3 Air Distribution Systems
Air Distribution Systems - fans, filters, fan coil units, ductwork, outlets, dampers.

SUGGESTED EXERCISES
- Site visits of buildings where different types of Air-conditioning systems have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of an air-conditioning system and the location of their parts and how they will be connected.

SECTION – B, LIFT SERVICES

Module-4 Introduction & Principles
Fundamentals of lift services System Design.
Building Plans, Drawings and Schematics.
Definitions regarding lifts such as average travel lift carrying capacity, rated load, rated speed, RTT etc. Grouping of lifts and design standards of a lift lobby.

Module-5 Lift types
Types of Lifts. Working of lifts with details of lift section describing various parts of lifts.

Module-6 Escalator
Types of Escalators.
Fundamentals of escalators, Function and working of Escalators.

SUGGESTED EXERCISES
- Site visits of buildings where different types of lifts & escalators have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of these systems and the location of their parts and how they will be connected.

APPROACH
- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCE BOOKS
BACHELOR OF ARCHITECTURE (B.ARCH)

5. Understanding Buildings: A Multi-disciplinary Approach, E Reid, MIT.
8. ASHRAE Publications.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.Arch)

B. ARCH. SEMESTER – V
RAR – 507, HISTORY OF ARCHITECTURE – IV

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<td>Module-7</td>
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OBJECTIVES

- Understanding of the period in terms of its location, climate as well as the socio-cultural, historical, economic and political influences of the time.
- Study of the building ‘types’ and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.
- Understanding the intentions of the period and architects as a solution to the need or demands of the period.

Module-1 Introduction:
Introduction and understanding of ‘Islam’s’ philosophy and its consequent rituals and their interpretation in building type e.g. mosque, tomb, fort and their elements like domes, minarets, arch, squinch, landscape, motif, calligraphy, directionality, symmetry, geometry, material, court, water, patterns etc.

Module-2 The Sultanate Style:
The architecture of early Islamic dynasties that ruled from Delhi like the Slave, Khalji, Tughlaq, Sayyid, Lodhis and ShershahSuri regimes. The formation of ‘Indo-Islamic’ style that was the amalgamation of Islamic space and prevalent Hindu techniques of building and materials.

Module-3 Provincial Architecture:
Development of colloquial styles in various provinces of India like Punjab, Jaunpur, Gujrat, Bengal, Bijapur, Bidar and Deccan.

Module-4 Cities and Citadels:
Morphology of fortified cities of Jaisalmer, fort/ palaces like Mandu, Chittorgarh, Orchha, Datia, Jodhpur etc. with an overview on architectural types like havelis, stepwells, gates, baradaris etc.

Module-5 Mughal Architecture:
The architecture of the Timurids in India- Babur, Humayun, Akhbar, Jahangir and Shahjahan, which was the culmination of the Indo-Islamic paradigm. The proportions, structure systems, landscape, materials, scale and distinct features.

Module-6 The Later Moghuls:
The Oudh architecture, which was a blend of the Mughal style and the British features, in Lucknow and its environs. The manzils, baghs, kothis, imambaras, karbalas: their planning, materials and techniques.

Module-7 Colonial Architecture:
The British architecture of the colonial days in India- the capitol at Delhi and the residency at Lucknow emphasizing on their planning criteria and architectural features. Incorporation of local motifs and materials.

APPROACH:
1. Lectures to be specifically conducted with the visual aids and seminars presented by students.
2. Students will make written assignments and seminar presentations on architectural characteristics that identify the building types and the intentions of the period in response to context and time.
3. Free hand sketches and orthographic drawings could be made by students in the tutorials on specific building examples to familiarize them with the architectural character that identify the works of the particular period.
4. Scaled, sectional models of historical buildings to be encouraged to understand the scale and proportion.
REFERENCE BOOKS
3. Rober Hillenbrand “Islamic Art and Architecture” Tames and Hudson.
4. Rober Hillenbrand, “Islamic Form Function and Meaning”.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.
- To understand the basic methodology of writing a technical paper.
- To be able to write a technical paper of about 2000 words.

Module-1 Introduction

- Anatomy of a technical paper- parts of a technical paper; its chronology

Module-2 Technical Writing

- Intent of the paper
- Structuring the paper; formulating a synopsis
- Identifying sources- categorization into direct and indirect; sequencing them in order of significance.
- Referencing

Module-3 Writing a technical paper

- Writing a paper of 2000 words in following stages:
  - Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope, Methodology.
  - Structuring the body of the paper in detail
  - Ascertaining Primary and Secondary Sources
  - Utilizing the sources to reach to the desired objectives
  - Editing the paper

LIST OF ASSIGNMENTS

1. Writing a paper of 2000 words. This should be broken down stage wise and a feedback be given at every stage.
2. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS

3. Joseph Gibaldi, MLA handbook for Writers of Research Papers

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 509, SOCIOLOGY

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OBJECTIVES
- To expose the students to the relationship between man and environment.
- To familiarize the students with basic concepts, theories and issues of Sociology and its relevance to Architecture.

Module-1 Introduction
Study of Sociology, Sociology and Architecture, Basic concepts – Society, Group, Community (Rural and Urban), Association, Institution.

Module-2 Culture and Society
Concepts of culture, Cultural identity and cultural diversity, Factors of socio-cultural changes.

Module-3 Social Development
Introduction to the concept of development, Types of development - rural, urban and rurban.

Module-4 Demography

Module-5 Social Institutions
Family, Marriage, Religion.

Module-6 Social Infrastructure
Education, Health, Recreation.

REFERENCE BOOKS

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OBJECTIVES

- To understand the constraints of multiple housing units in an urban setting with respect to social norms, climate and client’s expectations.
- To understand design limitations due to authority guidelines and making drawings / details necessary for final execution of a project.
- To integrate services and structure system in the housing design project.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Introduction
Acquainting with the various ways of designing a group housing in urban context i.e. low/medium rise- high density; high rise- high density etc.

Module-2 Study and Analysis
Through literature studies and case studies analyze the constraints, typologies and interventions in housing throughout India and the rest of the world.

Module-3 Design Proposal
Design of a housing project incorporating varied formats of grouping on an actual site with specific bye-laws and regulations.

Module-4 Integration of Services and Structure
Development of the housing proposal to the stage integrating services, structure and other infrastructural facilities necessary for the final execution of the project and making relevant drawing for the same.

SUGGESTED STUDIO EXCERCISES
1. Design of group Housing in varied formats with diverse by-laws and regulations.

REFERENCE BOOKS

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BACHELOR OF ARCHITECTURE (B.ARCH)

**B. ARCH. SEMESTER – VI**
**RAR – 602, CONSTRUCTION & MATERIALS – VI**

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**OBJECTIVES**
- To acquaint the students to usage of building materials such as Metals (Non - Ferrous), Additives & Admixtures and Construction Equipments.
- To understand the use of these building materials in building works.
- To introduce and familiarize the students with the various temporary construction works required for RCC construction works.
- To familiarize the student with the building construction practices on site.

**SECTION – A, BUILDING MATERIALS AND SCIENCES**

**Module-1 Metals (Non-Ferrous)**
- Non Ferrous – Copper & Copper based alloys (Brass & Bronze), Tin, Cadmium, Chromium, Zinc, Lead and Nickel.
- Metal Coatings – Electroplating, Anodizing.

**Module-2 Additives & Admixtures**
- Various additives and admixtures – Cementitious (crystalline) systems, Integral systems, Proprietary systems, Cementitious Coating system.

**Module-3 Construction Equipments**
- Electric hand tools, Vibrators, Pumps, Compactors/Rollers.
- Earth Moving & Excavation – Dozers, Scrappers, Graders, Shovels, Backactor, Dragline, Trenchers.
- Transportation – Lorries, Trucks, Dumpers, Hoist, Cranes (mobile, static, tower).
- Concrete mixers and pumps for ready mix concrete.

**LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)**
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit assembly workshops/shops etc. for better understanding and submit report.

**WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE**

**Module-4 Workshop/Construction Yard Practice**
- Practicing in construction yard by making the examples of components covered under ‘Building Construction Technology’.

**Module-5 Site Exposure**
- Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

**LIST OF ASSIGNMENTS**
1. To study the various tools, equipments used in RCC and temporary construction works.
2. To construct examples of RCC works in construction yard.
3. To survey construction work on site and submit report.

**SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY**

**Module-6 Doors, Windows & Partitions (Aluminium)**

**Module-7 Temporary Constructions**
- Centering, Shuttering and scaffolding
Module-8  **R.C.C. – I**  
(Formwork & Laying)  
Foundations - Isolated, Combined, Cantilever, Eccentric footing. 
Grillage and Raft foundation. Pile foundations – details of pile, varieties of piles, pile caps. 
Understanding of steel reinforcement types, laying, bending and binding. 

Module-9  **R.C.C. – II**  
(Formwork & Laying)  
Columns, Lintel, Projections/Chujjas and Beams. 
Understanding of steel reinforcement types, laying, bending and binding. 

Module-10  **R.C.C. – III**  
(Formwork & Laying)  
Slabs - Simply supported, Continuous & Cantilevered. 
Staircases – Waist and Folded slab. 
Understanding of steel reinforcement types, laying, bending and binding. 

**CONSTRUCTION PLATES**  
1. To understand the application of Aluminium Doors and Windows.  
2. To understand the application of Partitions in Aluminium framework with other suitable panel materials.  
3. To understand the application of temporary construction in buildings.  
4. To understand the construction of RCC Foundations along with its’ steel works.  
5. To understand the construction of RCC Columns, Lintels, Projections and Beams along with its’ steel works.  
6. To understand the construction of RCC Slabs & Staircases along with its’ steel works. 

**APPROACH**  
- The students would be familiarized with vernacular terminology as prevalent in this part of the country.  
- The emphasis will be construction details as applicable to Indian conditions.  
- Site visits and market surveys will be an integral part of sessional work. 

**REFERENCE BOOKS**  
5. Building Construction Mitchell (Elementary and Advanced)  
9. Mitchell’s Structure & Fabric-II  
10. Concrete: Microstructure, Properties and Materials P. Kumar Mehta  
11. Properties of Concrete A. M. Neville  
20. Engineering Material-Roy Chowdary  
25. Testing of Concrete in Structures J H Bungey and S. G. Millard  

**CRITERIA FOR ASSESSMENT OF SESSIONALS**

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OBJECTIVES

- To understand the structural behavior of various structural elements.
- To understand the analysis and design of R.C.C. structures and their use in building industry by LIMIT STATE METHOD.
- To understand the analysis and design of Steel structures and their use in building industry by LIMIT STATE METHOD.

Module-3  Analysis & Design of R.C.C. Column
Introduction, Effective height of column, Assumptions, Minimum eccentricity, Analysis and design of short R.C.C. column under pure axial load as well as under axial load and bending moment and detailing of its reinforcement.

Module-2  Analysis & Design of R.C.C. Foundation &Footing
Introduction, Type of foundation, Depth of foundation, Theory & design of axially loaded isolated square footing and detailing of its reinforcement.
Pile foundation - Introduction, classification and its application.

Module-3  Analysis and Design of R.C.C. Retaining wall
Introduction, Types of retaining walls, Analysis and Design of cantilever retaining walls and detailing of its reinforcement

Module-4  Analysis and Design of Steel Structure
Various types of connections-
Welded connection – Introduction, Types of welded joints, Important specifications for welding as per IS code, Design strength of welded joints. Analysis and Design of various types of members - Tension members – Introduction, Design Strength, Analysis and design of tension member.
Compression members – Introduction, Slenderness ratio, Actual length, Effective length, Design strength, Analysis and design of Compression member.

Module-5  Steel Structure
Understanding of Miscellaneous Structural Elements – Beam and plate girder & its use in building industry. Grillage foundation and its’ components & its use in building industry. Types of roof trusses and nomenclature of its members.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student’s exposure to practical aspects of design.

REFERENCE BOOKS

BACHELOR OF ARCHITECTURE (B.ARCH)
3. P.C. Varghese, “Advanced Reinforced Concrete Design”.
4. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C. Designs”
5. S.S Bhavikatti “ Steel Structures by Limit State Method as Per I.S. 800-2007

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BACHELOR OF ARCHITECTURE (B.ARCH)
BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VI
RAR – 604, DISASTER MANAGEMENT

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OBJECTIVES
- To make the students understand the disaster management cycle.
- To create awareness about natural disasters, factors that cause them, and to foster knowledge about strategies for disaster prevention and management.
- Overview of major natural disaster through case studies.
- Their role in design & planning solutions, for reduction of risk and damages caused.

Module-1 Hazards & Disasters
Introduction to disaster management, Indian scenario, Understanding of disaster, Hazard and its classification, Vulnerability, Capacity, Risk.
Various Types of disasters.
To understand in detail for the cause, adverse effects, distribution patterns, mitigation measures of Earthquake, Tsunami, Cyclone, Flood and Landslide.
Disaster Management cycle.

Module-2 Case Studies
Studies to understand above mentioned disasters (National as well as international) occurred in the past & their inferences.

Module-3 Disaster Preparedness
Disaster Management Act, guidelines NDMA.
Vulnerability Assessment & warning systems for above said disaster types.

Module-4 Disaster Response
Programmes and studies for disaster reduction, Communications.

Module-5 Disaster Mitigation
Pre disaster, emergency, transition, and recovery. Disaster management plan, Natural crisis management committee, State crisis management group.

Module-6 Disaster Resistant Construction Techniques
Risk reduction measures through land use control, site planning and land management, design and construction of structures for above mentioned disaster.

REFERENCE BOOKS
1. Building Configuration and Seismic Design-Christopher Arnold.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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**TOTAL** 35

**OBJECTIVES**
- To initiate the students into theory and practice of estimation and quantity surveying.
- To develop the understanding of specification writing.

**Module-1 Specifications (Materials)**
- Introduction, importance and scope.
- Types of specifications, Correct form and sequence of clauses for writing specifications. Study and uses of standard specifications viz; drafted by C.P.W.D.

**Module-2 Specification (Items of works)**
- Writing detailed specifications for various items of work eg. Earthwork in foundation, Cement concrete, Reinforcement cement concrete work, Brick work in cement mortar, Damp proof course, Wood works (door & windows), Glazing, Plastering (cement & sand), Flooring (cement concrete & tiles), Distempering (dry & oil bound), Painting on wood & iron work, Water proof cement painting, Brick bat coba terracing.

**Module-3 Estimation**
- Introduction, Importance & scope.
- Types of Estimates – Preliminary, Plinth area, Cubical content, Approximate quantity, Detailed / Item rate method estimates.
- Method of Estimation – Separate / individual wall, Centre line methods of estimation.

**Module-4 Estimation Exercises**
- Exercises in estimation using different methods, for small or medium size buildings.

**Module-5 Rate Analysis**
- Labour out turn and norms of consumption of basic materials.
- Principles of analysis of rates, Market / DSR rates of labour and materials.
- Exercises in rate analysis of various items of work mentioned in Module – 2.

**Module-6 Accounting Procedures**
- Introduction to P.W.D accounts procedure, measurement book, daily labour, muster roll, stores, stock, and issue of material from stock, indent form, impress account, cash book, and mode of payment.

**LIST OF ASSIGNMENTS**
1. To study the various types of estimates.
2. To prepare detailed estimate for a small building.
3. To study the importance and correct form of writing specifications.
4. To prepare detailed specifications for various items.
5. To study the principles of analysis of rates and prepare analysis of rates for various items of work.
6. To understand the standard accounts procedure and record keeping.

**APPROACH**
- The course would be covered through lectures and tutorials.
- The students’ seminars will help realize the grasp on the subject matter.
REFERENCE BOOKS
2. Birdie, G. S. Estimating and Costing
3. Chakrab orthi, M. Estimation, Costing and Specifications, Laxmi Publications
12. Standard Schedule of Rates for Delhi, CPWD & UPPWD.
13. Standard Specifications, CPWD & UPPWD
14. I. S. 1200 Parts I to XXV – Method of Measurement of Building and Civil Engineering Works, Bureau of Indian Standards

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OBJECTIVES

- To develop an understanding of the advanced building services such as Fire Protection and Security and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

SECTION – A, FIRE PROTECTION

Module-1 Introduction
 Causes and spread of fire.
 Fire triangle/ tetrahedron. Classes of fire.
 Combustibility of materials and fire resistance.
 Building Plans, Drawings, and Schematics.

Module-2 Fire Detection & Alarm Systems
 Fire Detection Equipments- Heat & Smoke sensors.
 Fire Alarm Systems.

Module-3 Fire fighting & Extinguishing Techniques
 First stage firefighting equipment, Ladders, Snorkel ladder.
 Fire fighting pump and water storage, Hose and hose fittings, Dry and wet risers, Automatic sprinklers.
 Fire Extinguishers - Portable fire extinguisher and other fire fighting equipments.
 Means of escape, Fire escape, Fire doors and Water curtain.

SUGGESTED EXCERCISES

- Site visits of buildings where different types of Fire protection equipments have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-strayed building installation of these systems and the location of their parts and how they will be connected.

SECTION – B, ELECTRONIC SECURITY AND SURVEILLANCE SYSTEMS

Module-4 Perimeter Protection, Intrusion Detection & Alarm Systems
 Perimeter Protection - Barriers, Doors, Gates, Turnstiles and Fences.
 Intrusion Detection Sensors and Systems - Outdoor & Indoor.
 Building plans, Drawing & Schematics.

Module-5 Access Control
 Introduction to Access Control Systems, Locks & Emergency Exits.
 Visitor Management Systems.
 Identification Systems – PIN, Card, Wireless systems and Biometric systems.
 Components of Basic Systems.

Module-6 Surveillance & Recording System
 Security Lighting, Illumination including Infra-red.
 Understanding CCTV cameras - Pan, Tilt & Zoom mechanisms.
 Recording Systems – Digital and Analog Recording.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

PERIODS EVALUATION SCHEME

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BACHELOR OF ARCHITECTURE (B.ARCH)

REFERENCE BOOKS
5. CCTV (Newnes) by Vlado Damjanovski (1999).
9. Building Automation Online by McGowan; McGowan, John J.
10. CCTV by Damjanovski, Vlado; Edition: 3 Publisher: Butterworth- Heinemann.

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B. ARCH. SEMESTER – VI
RAR – 607, HISTORY OF ARCHITECTURE – V

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OBJECTIVES

- Understanding of the period in terms of its location, climate as well as the social cultural, historical, economic and political influences of the time.
- Study of the different building and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.
- Understanding the intentions of the period and architects as a solution to the need or demands of the period.

Module-1 Picturesque and Neo-classical architecture:
Purity and structural honesty of antiquity preferred over ornamentation and exaggeration of Baroque. Representation of ancient Roman monuments in imaginary compositions. Archeological purism and importance of pictorial values in historical settings. Recreation of antique Roman simplicity and splendor for modern living. Study of important palaces and public buildings in Britain and France.

Module-2 Enlightenment and beginnings of Modern:
Belief in creation of ‘new’ and ‘ideal’ world through return to fundamentals, ‘true’ and ‘original’ values. Romanticizing elementary geometrical forms with undecorated surfaces. Iron and glass construction for openness and lightness: Art Nouveau. Repetitive, Orthogonal, skeletal systems for horizontal and vertical expansion. Latter attempts to dissociate references to past styles.

Module-3 Modern Architecture:
Social intentions and search for ideal world. Pluralism in place of past unity of styles. Search for paradigms in historical sources: It return to fundamentals and origins in geometry, nature and paradigms of technology.
Expressions of construction and technology. Equating technology and progress with present. Functionalism and functional appropriateness. Thoughts and works of Frank Lloyd Wright, Walter Groupies, Le Corbusier, Mies van der Rohe, Alvar Aalto, Louis Kahn, Dutch De Stijl Italian futurists and Russian Constructivists.
International style: Oversimplification of the modern Movement into functional, steel and glass, cubes. Monotonous functionalist abstractions and Modernism as a style.
Disenchantment of modern cities and fall of modern Movement.

Module-4 Post Modern Architecture:
Post Modern Architecture as a revision of Modern architecture and resistance to functional containers of 60’s. Objective, representational and emphasis on content. Pluralistic and differing trends.

Module-5 Post Modern – Historicism:
Rooted to place and history. Regards of expression: ornaments, symbolism and context with irony and humour, exemplified through the works of James Stirling, Michael Graves, Charles Moore, Aratalsozaki.

Module-6 Neo- Modern:
Disregard historical imaginary to recapture ideas for modern architecture of 20’s. Hi-tech metal abstractions of Richard Rogers, Normal Foster, showing structure and equipment as implied ornament. References of Russian Constructivists. The early works of New York Five including later works of Richarmier as
BACHELOR OF ARCHITECTURE (B.ARCH)

complicated, exaggerated and sophisticated revival of the modern grid and Corbusier’s geometry. Synthesis of Hi-Tech and Historicism in the works Aldo Rossi, Mario Botta, Cesar Pelli.

Module-7  Deconstructive: Narrative and representational. Sources in Russian Constructivism. Non perfection in the works of Frank Gehry, Peter Eisenman, Bernard Tschumi, Daniel Libeskind, questioning traditional purity of form, geometry and structure.

REFERENCE BOOKS
1. Kenneth Frampton, “Modern Architecture; A Critical History” by, Tames and Hudson
5. Leland M Roth; Understanding Architecture: Its elements, history and meaning; CraftsmanHouse; 1994
6. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,
8. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,
11. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
15. Marvin Trastctenberg, “ Architecture from Prehistory to Post modernism”

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VI
RAR – 608, RESEARCH / SEMINAR / WORKSHOP - V

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OBJECTIVES
- Understanding basic principles of any research with special reference to architectural research and applications.
- To write a technical paper of about 5000 words with original input.

Module-1 Introduction
Module-2 Writing a technical paper

Learning the formulation of research question or hypothesis
Writing a paper of 5000 words in following stages:
- Formulation of an original research issue by ascertaining the gaps in research
- Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope, Methodology.
- Structuring the body of the paper in detail
- Ascertaining Primary and Secondary Sources
- Referencing in Harvard Style
- Utilizing the sources to reach to the desired objectives
- Editing the paper

LIST OF ASSIGNMENTS
1. Writing a paper of 5000 words. This should be broken down stage wise and a feedback be given at every stage.

REFERENCE BOOKS

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B. ARCH. SEMESTER – VI
RAR – 609, BUILDING ECONOMICS

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OBJECTIVES
- To develop an understanding among the students regarding management of physical and human resources including evaluation techniques pertaining to a business organization in general and specific to construction industry.

Module-1 Elementary concepts of Economics
- Introduction to Economics- Definitions, Needs & Wants, Nature & Scope of Economics.
- Division of economics –
  - Macro Economics-Economic system in India.

Module-2 Economics in relation to Architecture, Engineering and other sciences
- Meaning and scope of building economics, Issues and challenges associated with building projects.
- Building Efficiency, BuildingLife-cycle.
- Costs and Benefits of Building – Monetary and Non Monetary.

Module-3 Project Financing
- Types of Mortgage, Lease Arrangements.

Module-4 Economic performance of building
- Decision Making using techniques of economic performance to measure tangible and non-tangible issues - Cost-Benefit Analysis, Incremental Analysis and Multi-criteria Analysis.

REFERENCE BOOKS

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VII
RAR – 701, PRACTICAL TRAINING

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INTRODUCTION

A. TRAINING RULES:

Extracts from Ordinances, Scheme of Examination & Syllabus:
(For the award of the degree of B. Architecture by the Dr. A.P.J. Abdul Kalam Technical University. Lucknow)

Ordinance 16 PRACTICAL TRAINING:

16.1 Each student will be required to proceed on ‘Practical Training’ for the VII semester after appearing at the VI semester examination. The Principal/Head of Department of Architecture of the concerned Institute will approve the office of the ‘Practical-Training’ for the student.

16.2 The marks for ‘Practical Training’ will be awarded to each student in accordance with the Regulations and Guidelines issued separately by the Dr. A.P.J. Abdul Kalam Technical University.

B. AIMS OF PRACTICAL TRAINING:

1. The aim of the ‘Practical Training’ is to enable the students to gain the kind and range of practical experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course.

2. The ‘Practical Training’ should be regarded as an important academic activity. Howsoever good the arrangement of training may be, the trainee student, still, has the responsibility to use his own initiative in making the best use of the opportunities which he/she gets during training period and prepare himself/herself for the profession.

3. The student should try to seek a variety of experiences in his/her ‘Training office’ to acquaint himself/herself with various works, procedures etc. of building trade.

GUIDELINES FOR STUDENT TRAINEE

1. Criteria for selection of a Training Office
   - In case of proprietorship firm, the proprietor shall be an architect; also, the firm shall have at least two or more architects as employee/associates.
   - In case of ‘Partnership’ / ‘Pvt. Ltd.’ Firms, at least one of the partner/director shall be an architect, and the firm shall have at least one or more architects as Partner/director/employee/associate.
   - In case of a ‘Public-sector’ / ‘State or Central Government office/ Academic institute or a multinational organization’, there shall be a separate wing for architectural consultancy works.
   - The said architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 10 years of working experience and the organization should have a variety of projects.

2. Working Relationship between Architect and Trainee
   - The architect shall provide enough jobs to the trainee to keep him/her occupied.
   - The Architect shall expose the trainee to difference aspects of professional practice. The tasks given to the trainee shall include the following-
     - Preparation of
       - Sketch designs, presentation drawings etc.
       - Municipal drawings according to the byelaws.
       - Workings drawings and details.
       - Estimates, bill of quantities & specifications.
- Discussions with
  - Clients.
  - Structural Consultants.
  - Services Consultants.
- Inspection and management of site.
- Preparation of
  - Models, perspectives and photographs.
  - Reports, progress charts etc.
- Other administrative works.

3. Honorarium/Stipend
   - The architects usually pay some amount as honorarium/stipend to meet out of pocket expenditure to the trainee. The Institute/College of the student shall have no objection if the trainees accept/receive such honorarium/stipend.
   - The mode and amount of the honorarium shall depend upon the office and be based upon a mutual agreement between the employing architect and the trainee. However it shall neither be a claim of the trainee nor binding on the architect but in order of professionalism and to maintain the dignity of profession, the training office of architects pay a respectable amount as stipend/honorarium.
   - The Institute/Training and Placement cell of the Institute shall not in any way be responsible for the payment against any sorts of damages, whatsoever.

4. Code of conduct for the trainee
   - He/she shall abide by the rules, regulations and general instructions of the office/firm.
   - He/she shall remain punctual and regular in attendance.
   - He/she shall make all efforts to learn the work involved in the profession, and if so required for work, shall attend the office beyond the scheduled time in the office.
   - He/she shall respect and obey the senior members of the office/firm.
   - He/she shall take up the job with full responsibility and show utmost interest in the work allotted.
   - He/she shall inform the institute/training and placement cell about joining in the training office, its address and contact numbers. He/she shall also inform the address of the accommodation acquired during the training period.
   - He/she shall remain in regular touch with the institute/Training and Placement Cell and shall keep the Training and Placement Cell fully informed about his/her progress in the training office.
   - In case of any complaint or misconduct, the Institute/Training and Placement Cell may take suitable and strict action against the student.

5. Arranging/Fixing-up the Training office
   - The Department / Faculty of Architecture, directly or through the ‘Training and Placement Cell’ of the Institute shall provide a list of offices, along with their addresses of some well-established and recognized architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to ‘Criteria’ as laid down for selection of a training office.
   - After seeking advice from ‘Training and Placement Cell’, the student shall make his/her options available to the Training and Placement Cell.
   - With the help of ‘Training and Placement Cell’, the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.

6. Duration of Practical Training
   - The duration of practical training is equivalent to a semester. The dates to start and finish the practical training shall coincide with the starting and finishing dates of the respective semester, in accordance to academic calendar of Dr. A.P.J. Abdul Kalam Technical University. Lucknow. However, the candidate can start his/her practical training before the said schedule i.e. during summer vacations.

7. Joining and Leaving the Training Office
   - The trainee is expected to join the training office on the scheduled date, and submit his ‘Joining Report’ on the letterhead of the office duly signed by Head of the Training to the Institute in the Performa prescribed for the purpose and contained in the Log Book.
   - The trainee must obtain a ‘No DuesCertificate’ duly signed by Head of the Training and get relived from the office at the end of the training period or before changing the ‘Training Office’. The trainee must submit this ‘No Dues Certificate’ along with the Log Book.
8. Change of Training Office

- In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall inform the Principal/Director/Head of Department/Officer in-charge of the ‘Training and Placement Cell’, and seek prior permission for such a change.
- The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the ‘Duration of Training’ as prescribed in the ‘Ordinances, Scheme of Examination & Syllabus’ of the Dr. A.P.J. Abdul Kalam Technical University.

9. Final Submissions

After completion of practical training, the trainee is required to submit the following to the parent Institute.

- ‘Certificate’ of successful completion of the practical training, from the architect, in two original copies.
- ‘Daily Diary’ with details of the day to day work record, which will be returned to the student after assessment and viva voce examination.
- ‘Log-Book’ in the prescribed format, duly filled up and signed by the ‘Supervisor’.
- ‘Training report’ supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the Training office and shall be duly signed by the ‘Supervisor’.
- Training report shall be submitted in two original copies. One copy shall be returned to the student after assessment of sessional marks and viva voce examination. The second copy shall be retained by the Training and Placement Cell/library. These shall be presented in A-3 size with ring binding.

10. Failures

- In case the student/trainee remains unsuccessful or fails in completing his/her practical training or viva-voce examination, the matter shall be dealt with in accordance with the relevant ‘Rules and Regulations’ of the Dr. A.P.J. Abdul Kalam Technical University.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION / SESSIONAL OF PRACTICAL TRAINING

- Practical training shall be evaluated internally by a panel, by questioning the candidate. The panel shall consist of at least two senior faculty members (Architect) and Practical Training Coordinator in addition. The assessment shall be made out of 300 marks (250 marks for Training report, 30 marks for Log-Book and 20 marks for Daily Diary) by the panel.
- In case of more than one section, in the Institute, there can be equivalent numbers of panel. In this case the panel shall consist of at least two senior faculty members (Architects) and Practical Training Co-ordinator / Asst. Practical Training Coordinator in addition.
- An assessment report (confidential) having a weightage of 100 marks out of the whole sessional marks, shall be obtained on a prescribed format (available on web site), from the training office. The report should be signed by the head of respective office.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF PRACTICAL TRAINING

EXAMINERS –

Each panel shall consist of -

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution /university.
- A faculty member (Architect) of the parent institution /university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution /university.
- An Eminent Architect from the profession with at least 15 years of field experience.

Kindly note that opportunity to evaluate a candidate shall be given once to a faculty member, in the semester i.e. either in jury panel of internal or final evaluation.

Further the Practical Training Coordinator(s) will act as facilitator.
OBJECTIVES

The presentation in this course shall cover, over and above the regular work done (in RAR - 701) by the trainee during the training period. It shall fulfill the following objectives -

- To make trainees understand and feel the importance of observation of Buildings of Importance, Historical places, Areas of prominence etc. within the city and nearby areas of training. The trainees shall present it through travelogue, photographs, measure drawings etc.
- To attend Conferences, Seminars, Workshops, Exhibitions etc. related to field of architecture during their period of training.
- To make students experience the issues related to Site Supervision and Execution through interactive outcomes with masons, site supervisors, vendors and other related professionals.

The trainee is expected to accomplish all the above three objectives during training period along with the period of summer-break.

SUBMISSIONS

After completion of practical training, the trainee is required to present / submit the following to the parent Institute / university.

- All relevant drawings / sketches, site measures etc. as jpeg image incorporated in power point format. The travelogue both in soft and hard copies in two numbers.
- Brochure / Study material etc. of Conferences, Seminars, Workshops, Exhibitions etc. attended in two sets.
- Diary, where interactive outcomes at site is noted down, along with photographs of site visits in one set.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION / SESSIONAL OF SEMINAR / PRESENTATION

Seminar / Presentation shall be evaluated internally by a panel, by questioning the candidate. The panel shall consist of at least two senior faculty members (Architect) and Practical Training Coordinator in addition. The assessment shall be made out of 100 marks by the panel.

In case of more than one section, in the Institute, there can be equivalent numbers of panel. In this case the panel shall consist of at least two senior faculty members (Architects) and Practical Training Coordinator / Asst. Practical Training Coordinator in addition.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF SEMINAR / PRESENTATION

EXAMINERS –

Each panel shall consist of -

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution / university.
- A faculty member (Architect) of the parent institution / university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
- An Eminent Architect from the profession with at least 15 years of field experience.

Kindly note that opportunity to evaluate a candidate shall be given once to a faculty member, in the semester i.e. either in jury panel of internal or final evaluation.

Further the Practical Training Coordinator(s) will act as facilitator.
BACHelor of ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
NAR – 801, ARCHITECTURAL DESIGN - VII

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OBJECTIVES

- Understanding design as a process of problem identification, space standards, formulation of requirements, evolution of design criteria and development of design of buildings in urban context, phasing and development.
- Understanding relationship of buildings amongst themselves and with a given environment.
- Incorporating the agenda of building bye laws, structure, site planning and landscape and services within existing context.

Module-1 Introduction
Understanding the importance of ‘context’ and built urban environment in design and lessons to be learnt in contextual insertions.

Module-2 Study and Analysis
Examining an existing urban environment for establishing parameters that influence contextual insertion within that fabric.

Module-3 Design Proposal
Design of multi-utility buildings / campus / complexes incorporating the constraints derived from the context it is placed in.

SUGGESTED STUDIO EXCERCISES
1. Study of a given urban fabric with underlying context.
2. Urban Intervention Projects: Design of buildings / building complexes in specific urban contexts such as heritage zones, near existing and within built environments.
3. Development of projects containing group of buildings with multiplicity of constraints such as relationship of land uses, space, architectural character, circulation, movement landscape and buildings.
4. The exercises such as redevelopment and urban improvement projects shall be generated after understanding the existing physical, socio-cultural, economic and political context surrounding activities etc.

APPROACH
- Design methodology shall take precedence over design.
- Model of existing site and context shall be prerequisite for design insertions.
- Part of project may be done in groups to develop teamwork and multi-faceted approach to design.

REFERENCE BOOKS
1. Architecture Today.
2. Concept to the manifest.
3. Projects of various Architects of similar nature.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- To introduce and familiarize the students with the usage of various metal/gypsum board partitions and false ceilings construction works.
- To introduce and familiarize the students with the various asbestos cement products for construction works.
- To introduce and familiarize the students with the various water proofing compounds used in construction works.
- To introduce and familiarize the students with the usage of various Plastics and Rubbers in construction works.
- To study the causes and remedies of various defects in existing and new construction.
- To familiarize the student with the advanced building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Gypsum & Asbestos Products
Introduction - Gypsum Board, Suspended Ceiling (Board & Tiles), Gypsum Plaster, Components and Accessories. Jointing and Finishing. Understanding of various Asbestos Cement products available for application in building industry.

Module-2 Water Proofing Compounds
Various waterproofing compounds - Neoprene, Butyl, EPDM, PVC, Polyurethane.

Module-3 Plastics and Rubbers

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)
1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit gypsum, asbestos, plastic factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice
Practicing in construction yard by making the examples of Gypsum board partition & false ceiling, P.V.C. doors and windows.

Module-5 Site Exposure
Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS
1. To study the various tools, equipments used in precast works.
2. To construct examples of precast works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Partitions & False Ceilings
Construction details of Metal Stud Partition (single layer).
Construction details of Suspended Ceilings (Gypsum Board)

Module-7 Water Proofing Works
Basements, Toilets, Kitchens, Terrace gardens. Expansion joints.

Module-8 Joints
Special Construction joints. Seismic joints.

Module-9 Doors & Windows
Door Frame and Shutters. Windows Frames and Shutters.
Module-10 Defects and Remedies

The study of various defects in buildings and their remedies. Defects caused by dampness, applied forces and changes in size.

CONSTRUCTION PLATES
1. To understand the application of gypsum board in metal stud partitions in building.
2. To understand the application of gypsum board in suspended / false ceilings in building.
3. To understand the application of water proofing works in building.
4. To understand the application of construction and seismic joints in building.
5. To understand the application of P.V.C. Doors.
6. To understand the causes and remedies of various defects in existing and new construction.

APPROACH
- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS
5. Building Construction. Mitchell (Elementary and Advanced)
9. Mitchell’s Structure & Fabric-II
10. Prestressed Concrete Structures: P. Dayaratnam
11. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
12. Properties of Concrete A. M. Neville
14. Modern Prestressed Concrete: J. R. Libby
15. Principle & Practices of Heavy Construction: Smith & Andres
18. Mitchell’s Structure & Fabric-II
22. Engineering Material-Roy Chowdary
28. Testing of Concrete in Structures J H Bungey and S. G. Millard
29. Non-destructive testing V. M. Malhotra
30. Learning from failure – deficiencies in Design, Construction and Service R N Raiker
31. Concrete: Repair and Maintenance Illustrated, Problem Analysis, Repair strategy and Techniques Peter Emons & Gajanan Sabnis
32. Construction Failure Jacob Feld, Kennith Harper.
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- To understand the reinforcement cement concrete design of structural elements

Module-1 Analysis & Design of Roof Trusses (Steel)
- Introduction and terminology of Roof Trusses, Types of Trusses, Analysis and design of Roof Truss (Fan Type) in Steel.

Module-2 Analysis & Design of Raft Foundation (R.C.C.)
- Introduction and need of Raft foundation. Analysis and design in R.C.C.

Module-3 Analysis & Design of Shell Structures (R.C.C.)
- Introduction to various types of shell structures. Analysis and design of shell structure (Hemi-spherical Dome) in R.C.C.

Module-4 Analysis and design of Pre Stressed Concrete

Module-5 Multistoried Buildings
- Introduction, Structural systems, Stiffening elements, Need for redundancy, Regularity, Member stiffness, Loads (Dead loads, Live loads, Wind loads), Approximate analysis for vertical loads and lateral loads, Effect of sequence of construction, Partition walls or infill walls, Coupling effect in buildings, Effect of joint width, Beam to column joint. Introduction to various loads resisting system.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student’s exposure to practical aspects of design.

REFERENCE BOOKS

1. Reinforced Concrete Design - AK. Jain.
2. Earthquake Resistant Design of Structures - Manish Shrikhande and Pankaj Agarwal.
4. Structural Design & Drawing Reinforced Concrete & Steel – N Krishna Raju
5. Steel Structures Design & Drawing – Prof. Harbhajan Singh Col. (Retd.)

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 804, TOWN PLANNING

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OBJECTIVES

- To develop an appreciation of the planning issues involved at the scale of a town or a city.
- To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.

Module 1 Introduction to Town Planning & Theories
Definitions of town planning, form of planning, Elements and planning principal of city plan, Shapes of plan in accordance to road networks. Introduction to basic planning theories Indus Valley, Ancient (Vedic) planning systems.

Module 2 Planning Concepts and Evolution
Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broadacre), Garden city (Letchworth), Radburn Theory (Radburn) and Neighbourhood planning.

Module 3 Planning Process & Standards
Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.

Module 4 Roads and Traffic Studies
Awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines.

Module 5 Modern Transportation Systems
New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.

Module 6 Modern Approach in Planning
Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)

REFERENCE BOOKS
1. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
3. Rangwala, Town Planning, Charotar publishing house
4. G.K.Hiraskar, Town Planning
5. Rame Gowda, Urban and Regional planning
6. V.N.Anbedkar, Town and country planning and Housing, orient longman, 1971
7. URDPFI Guidelines for Planning by TCPO.
8. IRC Guidelines.
10. Binode Behari Dutt, Town Planning in Ancient India.

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED) ; A–GRAPHIC DESIGN

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OBJECTIVES
- Demonstrate a thorough understanding of the elements of graphic design.
- Read, understand and communicate in the language of graphic design.
- Use technology such as Photoshop, Illustrator, Corel Draw and Internet Explorer.

Module-1  Introduction to the Graphic Design

Module-2  Basic Design
- Development of aesthetic sensibility towards design. Elements and principles of design.

Module-3  Calligraphy and Typography
- Anatomy of a letter, Typefaces, Typographic measurement, Typographic standards, Typographic guidelines

Module-4  Creating Images for Print & Web
- Formats, Resolution, Raster Vs Vector. Ethics and Copyright laws.
- Use of particular image formats for individual projects to create collages, logos, cd covers, etc. with the help of Photoshop.
- Corel Draw and illustrator software.
- Images scanned from the internet to create projects while learning to cite sources.

APPROACH
- In teams students create a business proposal and create branding for that business including a commercial and magazine ad. They present the product to all students.

REFERENCE BOOKS
2. John Krull, Graphis Design Annual, 2017

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED) ; B–CERAMICS

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OBJECTIVES
- To understand the versatility of clay, as a materials.
- To introduce ceramics, thereby creating various forms/pots while doing hands-on exercises.

Module-1 Study of Various Types of Clay
Clay body making, building shapes by coil & slab.
Practice & throwing on wheel.
Simple glazes.

Module-2 Preparing Different Clay Bodies
Creating three dimensional forms with the help of potter’s wheel.
Methods of Biscuit firing.
Glaze making & glaze firing.

Module-3 Callographs
Round & relief shapes by coil, Slab moulding and wheel work.
Moulding & casting tile making.
Biscuiting and glaze firing.

Module-4 Pottery
Pots and shapes made by coil method.
Pot making by throwing on potter’s wheel (elementary)

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED) ; C–ADVANCED MODEL MAKING

**OBJECTIVES**
- To introduce model making as a generative process, a tool in Design generation.
- To inculcate the dynamic act of model making in thinking process.
- To explore conventional and less conventional techniques of representation in an attempt to creative visualization and to understand drawings as vehicles of thinking.
- To understand the versatility in making models ranging from study to presentation and in varying scales and materials.

**Module-1 Surface Development**

**Module-2 Model Making Techniques**
Generative / geometry, fractals, parametric / material explorations (both in traditional materials like mount, foam, thermacol, clay, plaster of Paris, paper Mache, wood and new age materials like polystyrene, Aerocon blocks, plastics, meshes, and processes like carpentry, casting, moulding, welding, laser cutting, CNC cutting etc.

**Module-3 Use of Advanced Tools and Materials**
Painting model surfaces with various finishes, development of topography and landscape elements, use of materials like cork, polyurethane foam, use of laser, acid etching, stereolithographic (3D printing) for development of building and their envelopes.

**Module-4 Presentation Models**
Skills to use the tools with precision, Techniques for preparation of presentation models. General information and practice with different finishing material. Exercises involving topography, textures, landscapes, human elements etc.

**APPROACH**
- Students are made to explore a variety of tools and software that are available for the design process, which includes form exploration, modeling, and producing drawings. For Project students will be asked to develop digital generative drawings and then encouraged to develop their abilities in modeling their designs.

**REFERENCE BOOKS**

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BACHELOR OF ARCHITECTURE (B.ARCH)

(Outdoor/Indoor) of Module 4

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B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED); D–PHOTOGRAPHY

OBJECTIVES
- To impart the skills of taking aesthetically appealing and creative architectural photographs through the use of appropriate cameras / lenses and lighting conditions.

Module-1 Introduction
- Introduction to architectural photography. Various types of compositions framing, silhouette photography.

Module-2 Types of Camera
- Use of various cameras, lenses and accessories, handling of equipment.
- SLR, DSLR cameras, lenses for different focal lengths for various contexts.
- Use of wide angle, normal, tele, zoom, macro, close up lenses.
- Filters-UV, Skylight, colour filters, special effect filter.
- Shutter speeds - slow, normal and high and their various applications.
- Apertures - use of various apertures to suit different lighting conditions and to enhance depth of fields.

Module-3 Architectural Photography
- Optimizing selection of shutter speed, aperture and ISO. Twilight and night photography.
- Various uses of photography - documentation, presentations, competitions, lecture etc.
- Architectural Photography, Exterior and Interior photography.
- Practical exercises to understand composition.

Module-4 Photographic Documentation
- Creative photography / photo renderings for special effects using software.
- Play of light and shadows to achieve dramatic pictures. Effects of seasons, inclusion of greenery, foliage, clouds, human scale etc.
- Photo documentation of buildings highlighting quality of architectural elements and spaces.

APPROACH
- A teacher should give an intensive introduction to photography including darkroom techniques to develop visual perception through observation, composition, colour and light interaction, shades, as well as positive/negative space relationships.

REFERENCE BOOKS

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BACHELOR OF ARCHITECTURE (B.ARCH)

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**OBJECTIVES**
- To understand the recent development of parametric design in architecture both as a discourse and as a tool.
- To provide a brief yet systematic conceptual framework to parametric design in contemporary architectural practices.
- To develop in students’ basic skills in using parametric tools such as Grasshopper, Dynamo.

**Module-1** Elements of Parametric Design and Design Patterns
- Introduction to Parametric design, Historical development of parametric design, their characteristics and reusable parametric design approaches

**Module-2** Fundamental Concepts of Geometric Modeling
- Spatial coordinates, Projections, Boolean operations, Formal transformations, Freeform surface creation, Surface development and deformations aimed at architecture applications, Discretization and meshing, Digital prototyping and geometry reconstruction. Concepts in computational geometry applied to parametric architectural geometry modeling.

**Module-3** Parametric Modeling Techniques and Tools
- Introduction of tools for model design parametrically to illustrate the construction of geometrical relationships among complex shapes. Focus on hands-on techniques that can be applied to the design process, to extend the efficiency and productivity of work during the process.
- Use of softwares like Rhino, Grasshopper, Kangaroo, Revit and Dynamo.

**Module-4** Digital Fabrication
- Using 3D digital modeling to efficiently produce components without the need for 2D representation.
- Use of Ladybird and honeybee plugins for simulation.

**APPROACH**
- Through the combination of lectures, hands-on workshops and project-based seminars

**REFERENCE BOOKS**

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OBJECTIVES

- To enable the students to understand the alternative building techniques other than conventional ones with relation to economic and environmental outcomes.

Module-1 Introduction

Types of alternative building techniques like, Earth, Flyash, Bamboo, Thatch, Ferro-cement, etc. Advantages of alternative building techniques over conventional methods. Alternative methods of construction related to different materials and their comparison. Upgradation, modification and revision of various methods of construction

Module-2 Earth

Components of earth: gravel, sand, silt and clay. Characteristics, advantages and disadvantages, needs and usage of various methods of construction like walling, flooring and roofing techniques. Composite materials made from earth like rammed earth, compressed stabilised earth blocks, stacked earth, sun dried clay bricks, steam cured blocks, Wattle and Daub. Filler slab, Jack arch roof.

Module-3 Bamboo

Characteristics, advantages and disadvantages, needs and usage of various methods of construction like walling, flooring and roofing techniques. Preservation of bamboo, bamboo tiles, shingles, bamboo joints.

Module-4 Recycled Waste Materials

Types of waste used in construction. Benefits of using recycled waste materials. Materials made out from waste paper, wood, plastic bottles, plastic bags, earthen materials, steel, aluminium, copper, bricks, gypsum, straw, wool, carpets etc, Techniques of using these materials in building construction.

APPROACH

- A workshop should be conducted on any of the above mentioned building techniques.

REFERENCE BOOKS

2. Housing and building in hot-humid and hot dry climate/
3. Low-cost housing in developing countries/ Mathur,

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 806, ARCHITECTURAL SERVICES – V (ACOUSTICS)

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OBJECTIVES

- To understand the basic principles of physics of sound.
- To enable them to apply the knowledge in various buildings.
- To familiarize them with sound system equipments, available in market.
- To familiarize the student with laws as per National Building Code of India/BIS.

Module-1  Building Acoustics  Introduction -

Terminology and unit.
Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness and Intensity.

Common acoustical defects and recommended remedies –

Echo, Sound foci, Dead spots, Sound shadows, Resonance, Insufficient loudness, External noise and Reverberation.
Sabine’s expression for calculation of Reverberation time.
Absorbing and absorption coefficient.

Noise control –

Noise and its types, Noise pollution.
Sources of indoor noise, Indoor noise levels, Planning and design against indoor noise.
Sources of outdoor noise, Traffic noise levels, Planning and design against outdoor (traffic & buildings in built-up area) noise.
Identification of various sources of noise and recommendations to control them in various types of buildings e.g. – Residential, Educational, Hospital, Office, Hotels & Hostels, Industrial, Laboratories & Test houses, Miscellaneous buildings etc.

Constructional measures for sound insulation of buildings –

Materials, Hollow & composite wall construction, Floors & Ceilings.
Properties of good acoustical materials.

Sound system –

Sound reinforcement system, Public address system.
Familiarization and understanding of sound system equipment specification e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.

Acoustical design principles and factors –

Acoustical design principles for Auditoriums, Cinema halls, Conference rooms etc. and factors viz. Site selection & planning, Dimensions, Shape, Seats & seating arrangements, Treatment of interior surfaces, Reverberation & sound absorption.

SECTION – B, APPLICATION
BACHELOR OF ARCHITECTURE (B.ARCH)

Module-2  Acoustical Design  The understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms etc.

Module-3  Field / Market Surveys  Familiarization and understanding of sound system equipment available in market manufactured by various brands e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.

REFERENCE BOOKS
5. Catalogues of leading Audio equipments agencies e.g. Philips, Ahuja etc.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- To provide to students a strong knowledge base on, the various theories and concepts of design and how philosophy and strategies are related to architecture.
- This course aims to evolve a conceptual framework for intelligent appreciation of Architecture and to develop a vocabulary for discussing design ideas at a broader level

Module-1 Pre Modern
Antonio Gaudi; Charles Rennie Mackintosh; Antonio Sant’Elia; Adolf Loos; Auguste Perret; Peter Behrens; Bruno Taut; Gerrit Reitveld; Tatlin

Module-2 Modern
Gropius; Mies Van der Rohe; Frank Lloyd Wright; Le Corbusier; Alvar Aalto; Terragini; Louis Kahn.

Module-3 Post Modern

Historicism: Michael Graves & Robert Venturi, Bernard Tschumi.

Urbanist: Mario Botta, Aldo Rossi, Cesar Pelli.

Classics: Arata Isozaki, Michael Graves, Mario Botta.


Vernacular: Hasan Fathy.

Philosophy: Charles Jencks, Bernard Tschumi, Peter Eisenman, John Hejduk.

Critical Regionalism: Charles Correa, B.V Doshi, Tadao.

Materialist: Peter Zumthor.

APPROACH
Through the presentation of the work of the architects from Pre Modern, Modern and Post Modern, the students have to trace their ideology, their philosophical attitudes and the theories that may have contributed to their evolution. The architect may be associated with a theoretical movement or group, which needs to be highlighted through models, sketches and design assignments emphasizing the philosophy or style.

REFERENCE BOOKS
1. Pattern language-Christopher Alexander
2. The language of post Modern architecture -Charles Jencks
4. Kenneth Frampton, “Modern Architecture; A Critical History” by, Tames and Hudson
5. Colin Davies, “Thinking about Architecture and Introduction to Architectural Theory”
7. Le Corbusier, “Towards a New Architecture”
10. Aldo Rossi, “The Architecture of City”
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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
RAR – 808, DISSERTATION

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OBJECTIVES
- To research on a theoretical topic which may be relevant to the final thesis topic and do the necessary backgrounds work.
- Present the findings in report form

INTRODUCTION
Preparation of an Architectural Dissertation including reference to an extensive study of architectural examples and precedents in the selected field of study. This can be a related study for the final thesis next semester.

Each student is expected to submit one or more synopses for finalization of his/her topic. After finalization of topic, by set of faculty members, the student shall be allotted one or more faculty member(s)/Guide(s)under whose guidance he/she has to carry out his/her dissertation.

Module-1
Dissertation Plan
Marks = 25
Aims, Objectives, Hypothesis, Methodology, Scope & limitations.
Brief literature review.

Module 2
Stage II
Mid-Term Review
Marks = 50
Detailed literature review, Case studies, Data collection & analysis.
Revised dissertation plan.

Module-3
Stage III
Final Stage
Marks = 50
Final presentation of dissertation after incorporating suggestions of jury.
Draft report.

Module-4
Stage IV
Final Report
Marks = 25
Submission of Final report (10 – 15 thousand words) after incorporating suggestions of jury. It shall be duly referenced in standard format.

COMPOSITION OF JURY PANEL FOR EVALUATION OF DISSERTATION AT EVERY STAGE
- There shall be one or more jury panels. Each panel shall consist of the following -
  - Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution.
  - Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution.
  - Thesis Guide(s).
- There shall be three juries/presentations for each student in order to assess Stage I, Stage II and Stage III. The assessment of Stage IV, i.e. Final Report shall be assessed by the same set of jury members as in Stage III. Further the Dissertation Coordinator will act as facilitator.

REFERENCE BOOKS
OBJECTIVES

- This Design Studio attempts to foster an understanding required to handle large scale building projects like campuses and multi-utility building complexes.
- Understanding design as a function of specific agendas of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems.
- Integrating aspects of Sustainability in design and Site planning as essential components of the projects.
- Incorporating active methods for achieving sustainability like Water Harvesting, Waste management, Solar and Wind Energy beside others for achieving a smaller carbon footprint of the project.

Module-1 Introduction
Understand and learn how to solve the Built Environment needs for multi-faceted public activities especially for large campuses. Recognizing and Integrating aspects of Sustainable design and planning.

Module-2 Site Analysis & Case Study
Examining existing case and literature studies of similar nature to develop design criteria. Extensive Site analysis of the proposed site for assessing on-site and off-site potentials and constraints.

Module-3 Design Proposal
Design of large campuses incorporating principles of efficient and sustainable site planning, space planning, circulation and services.

Module-4 Integration of Advanced Services, Structure and Active Sustainable Strategies
Besides design and planning of buildings within the campus the concentrations also needs to be on integration of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems.

SUGGESTED STUDIO EXCERCISES
1. Major design exercise could include large institutional campuses, convention centers, large office campuses having auditoriums and other multi-utility buildings.
2. Small exercises could include design of high-rise buildings like offices, hotels, hospitals etc. incorporating development of advanced structural and service systems.

APPROACH
- Students should develop programs after prototype studies
- Effective Site planning of the campus will be emphasised upon
- Integration of complex services and structure will be deliberated upon.

REFERENCE BOOKS
1. Architecture Today.
2. Concept to the manifest.
3. Projects of various Architects of similar nature.
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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<tr>
<th>S.NO.</th>
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OBJECTIVES

- The understanding for the system to be adopted for the construction of large span & multi storey structures.
- To introduce and familiarize the students with the various roofing products for construction work.
- To introduce and familiarize the students with the various construction equipments required for speedy and effective construction works.
- To familiarize the student with the advanced building construction practices on site e.g. composite construction.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Forms of Steel for Industrial construction & Roofing products

Classification, Availability, Characteristics and Uses of forms of steel and first to fourth generation steel roofing products.

Module-2 Advanced Structural Concretes Materials for Pre-Stressing

Structural Light weight Concrete, High Strength Concrete-Classification, Availability, Characteristics and Uses. Classification, Availability, Characteristics and Uses.

Module-3 Forms & Materials for Speedy Construction

Reinforcement types, RMC. Advanced Formwork systems - Table Form / Flying Form, Column Formwork Systems, Horizontal Panel Systems, Vertical Panel Systems, Jump Form, Slip Form & Tunnel Form. Classification, Availability, Characteristics and Uses.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit P.V.C. factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice

Practicing in construction yard by making the examples of pre stressed components, industrial construction and speedy construction.

Module-5 Site Exposure

Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in Precast and Prestressed works.
2. To construct examples of precast and prestressed works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Industrial Construction

Structural Steel Works - Portal Frame Construction, North-light truss and Lattice girder roof with various roof coverings (corrugated metal sheets as roof panels- first to fourth generation sheets).

Module-7 Pre-stressed Concrete

Introduction, methods of pre-stressing, types of post-tensioning systems. Types of pre-stressed concrete structures- Beams (Short span, medium span, long span), Girders & Joists. Slabs (one way, two way, flat slabs, hollow core slabs, planks), Single & Double T slabs. Channel sections, Folded plate structures. Composite construction.
## Module-8 Prefabrication & Precasting
Systems of pre fabrication – open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.
- Precast RCC Frames - Beams and Column Frames, Wall Frames, Hollow core slabs, Planks and Tee slabs resting on Beam & Column frames and Wall frames. Connections between various components- beam to column, column to column, beam to slab, wall to slab.

## Module-9 Speedy Construction
Methods, Types of floor construction – cast in situ, precast & composite construction.
- One-Way Slabs - Solid slabs, Slabs with wide beams, Ribbed slabs (One-Way Joists), One-Way joists with wide beams, Troughed slabs (ribbed slabs with integral beams and level soffits).
- Two-Way Slabs - Solid slabs, Waffle slabs designed as Two-Way slabs, Waffle slabs designed as Two-Way slabs with integral beams and level soffits, Flat slabs, Flat slabs with drops, Flat slabs with column heads, Waffle slabs designed as flat slabs
- Lift slab construction, Cast-in-situ service & stair cores, Cross wall & Box frame construction.

## Module-10 Modular Coordination
Aims, basis, planning, dimensioning.
- Assembly of components, tolerances, positioning of functional elements – slabs, walls, staircases.

### CONSTRUCTION PLATES
1. To understand large span structural steel works e.g. portal frames and truss-girder frames with various roof coverings products.
2. To understand the application of pre-stressed concrete in buildings – planks, hollow core slabs, single & double tee slabs, beams, columns and composite construction.
3. To understand the joint details in prefabricated buildings.
4. To understand one way and two way slab system in speedy construction.
5. To understand speedy construction techniques in buildings.
6. To understand the modular coordination in buildings’ design and their components.

### APPROACH
- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

### REFERENCE BOOKS
5. Building Construction_Mitchell (Elementary and Advanced)
9. Mitchell’s Structure & Fabric-II
10. Prestressed Concrete Structures: P. Dayaratnam
11. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
12. Properties of Concrete A. M. Neville
14. Modern Prestressed Concrete: J. R. Libby
15. Principle & Practices of Heavy Construction: Smith & Andres
BACHELOR OF ARCHITECTURE (B.ARCH)

22. Engineering Material-Roy Chowdary
28. Testing of Concrete in Structures J H Bungey and S. G. Millard
29. Non-destructive testing V. M. Malhotra
30. Learning from failure – deficiencies in Design, Construction and Service R N Raikar
31. Concrete: Repair and Maintenance Illustrated, Problem Analysis, Repair strategy and Techniques Peter Emons & Gajanan Sabnis
32. Construction Failure Jacob Feld, Kenneth Harper.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 903, PROFESSIONAL PRACTICE - I

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OBJECTIVES

- To acquaint the students with the role of an architect in society; scale of charges; an architect’s conduct in architectural Practice.
- To familiarize a student with requirements of Architectural Competitions and appointment of a contractor through tenders.
- To familiarize the students with Easement rights.
- To familiarize students with Valuation of property.

Module-1 Organization of Profession

Introduction to the professional Organisations e.g. the Indian Institute of Architects, the Uttar Pradesh Architects Association. Their Objectives, working constitution, byelaws, categories of membership, election procedure etc. Detailed Study of the Architects’ Act 1972, Council of Architecture and its role.

Module-2 Professional Conduct, Conditions of Engagement

Conditions of engagement of an architect - Duties: Responsibilities and liabilities of an architect towards the profession and society, Scale of Professional charges and mode of payment etc., Code of professional conduct and ethics, Need and types of competitions, procedures for conducting competitions.

Module-3 Tenders and Contracts

Concept of Contract and essential elements of contract. Tenders, their need and types. Preparation of tender documents and procedure for awarding tenders and award of projects.

Module-4 Office Organisation and Management


Module-5 Valuation of Properties

Fundamental concepts of Valuation, classification and types of valuation, Elements and factors affecting valuation; Valuation of immovable properties, Techniques for valuation of landed and building property.

Module-6 Arbitration


APPROACH:

- The course will be covered through lectures citing practical examples.
- Specialist should supplement the course through extension lectures.

REFERENCE BOOKS

1. Dr. Roshan H. Namavati, Professional practice
3. The Indian Institute of architects, the handbook of Professional Practice.
4. Madhav Devshaktu, Professional Practice.
BACHELOR OF ARCHITECTURE (B.ARCH)

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7|9TH & 10TH SEMESTER SYLLABUS
OBJECTIVES

- To make students aware of plant-scape around them
- To encourage hand drawing & drafting in landscape presentation drawings
- To familiarize students in preparation of simple landscape proposals.

Module 1 Introduction to Landscape Architecture
Role and scope of Landscape Architecture
Factors affecting Landscape:
Climatic / Natural conditions- (soil, water, landforms, vegetation, temperature, humidity, rainfall), Scale, Material, Cost, Time.
Elements of Landscape Design:
Natural elements (Landform, water, plantscape, microclimate)
Design elements: (man-made water bodies, landscape furniture, lighting, hardscape and softscape)
Principles of Landscape Design:
Unity, Symmetry, Balance, Hierarchy, Repetition, Sequence with suitable examples

Module 2 Landscape Graphics
Techniques on making handmade landscape drawings: trees of varied textures, landforms, buildings, paving, foliage patterns, tone contrast, & balance, rock & water and other landscape features. Conventional symbols in landscape presentations.

Module 3 Concise Theory and Evolution of Landscape Architecture
Brief review of different garden styles.

Module 4 Site Planning
Detailed site analysis, identifying potentials and constraints, Site Mobilization, Sequence of site activity, Site protection measures, Site implementation, Contour Sites.

Module 5 Landscape Engineering
Landscape details including-
Road and Parking, Paths and Plazzas.
Wall, Steps, Ramps and Decks.
Planters, Bed edges and Terraces.
Pools and Water bodies.
Terrace landscape and Vertical garden.

Module 6 Planting Design
Classification of Plants in accordance with composite climate: Trees, shrubs, groundcovers, flowering plants, creepers and climbers.

Module 7 Landscape Design
Landscape project: Inventory, Site analysis and Site planning, Conceptual design, Design development and Proposals and relevant constructional details.

APPROACH
1. Emphasis would be in drawing in studios
2. Site-visits to botanical gardens, existing parks & urban spaces
3. Suggested design exercises of traffic islands; small residences, campuses etc.
REFERENCE BOOKS
1. Geoffry& Susan Jellicoe: landscape of Man: shaping the environment from pre-history to the present day.
2. Brian Hackett: planting design
4. Ian Mcharg: Design with nature
5. Simonds: landscape architecture
6. Jay Applaton: Experience of Landscape
7. Paul Bannet: The language of Landscape
8. SimondsSwaffield: Theory in Landscape Architecture
9. Trees of Delhi
10. Landscape Detailing (Vol. 1-4)- Michael Littlewood

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BACHELOR OF ARCHITECTURE (B.Arch)

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); A–BUILDING CONSTRUCTION MANAGEMENT

PERIODS EVALUATION SCHEME

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OBJECTIVES

- To provide an insight into Management of Building/Construction projects involving management of money, manpower and machinery.
- To enhance the professional ability of an Architect about the methodology of executing a Project.
- To expose the students to the currently prevalent techniques in the planning, programming and management of a project.

Module 1 Introduction

- Aim, objectives and functions of construction management.
- Role of Architect & Construction/Project Manager in Construction Management.
- Resources of construction Industry.
- Various stages of construction.

Module 2 Organization

- Organization, types of organization study of organizational structures suitable for building and construction projects, the roles of the various members of a typical construction organization, responsibility & authority, functions in the management process, qualities of an ideal construction organization and ethics in construction industry.

Module 3 Construction Management Techniques

- Construction Planning scheduling and controlling phases. Levels of details & time scale Resource scheduling, Smoothing & levelling, Project execution, Monitoring & progress reporting.

Module 4 PERT and CPM

- Use of Management techniques –PERT and CPM; event, activity, dummy, network rules, graphical guidelines for network, numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis.
- Cost time analysis in network planning using CPM.

Module 5 Mechanization

- Advanced and automated technology in construction
- Introduction to construction equipment, performance, characteristics of equipment. The role of equipment /machinery in construction industry, factors affecting selection of construction machinery, standard versus special equipment, and understanding of the various issues involved in owning, operating and maintaining of construction equipment, economic life of equipment.

Module 6 Resource Allocation & Quality Control

- Planning of temporary services at the site, Safety precautions at construction sites, Security of materials at building site, Stages of inspection and quality control.
- Computer applications in construction management. Introduction to IT in construction industry-software packages.

REFERENCES:

1. Construction Planning, Equipment and Methods by RL Peurifoy
2. Project Management for Architects by S P Mukopadhyay
3. Part and CPM by L S Srinath
4. Project management through network technologies M. Thyagarajah
6. Dr. B.C.Punmia et al. Project planning and control with PERT and CPM, Laxmi Publications, New Delhi

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); B–HOUSING

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|         |         |          |          | 3 HRS. | 3 HRS. |        |        |      |       | 3 HRS. |          |

OBJECTIVES

- To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.
- Understanding of the various issues involved in urban and rural housing and knowledge about the planning and design solutions for low income groups

Module 1  Introduction & Terminology
- Housing Need and Demand in India - Present and Future.
- House, Housing and Settlement. Detached and Attached House Types.
- Net & Gross Residential Density, Perceived Density, Zoning.

Module 2  Settlement Patterns
- Introduction to human settlement, Settlement types and patterns, Relation of housing in present day context with relation to human settlement patterns.

Module 3  Issues Affecting Housing

Module 4  Objectives of Housing Agencies
- Objectives and role of government, urban local bodies and other agencies in housing development: Census, NSSO, HUDCO, State Housing Board, NBO.

Module 5  Housing Schemes
- Understanding of various housing schemes- Rajiv Awas Yojana (RAY), Pradhan Mantri Awas Yojna (PMAY), Site & Services Scheme, Rental Housing Policy, Slum Rehabilitation Policy.

Module 6  Housing Development & Design
- Understanding of various Housing categories through case studies e.g., Condominiums, Co-operative Housing, Affordable Housing, Rural Housing, – Their Advantages and Disadvantages.
- Understanding of Neighbourhood. Exercises of moderate magnitude on Neighbourhood Planning.

REFERENCE BOOKS:
6. Miglani O.P., Urban Housing in Developing Economy.
7. Jain A.K., Urban Housing and Slums.

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); C–URBAN DESIGN

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OBJECTIVES

- The overall goal of the course is to help students formulate an understanding of the urban forms and spaces. City history and theory will be examined.
- The contemporary needs of the society and the role of spaces will be dealt along with the need for design control.

Module-1 Introduction

Emergence of urban design as a discipline, definitions and its ambiguities.

Module-2 Urban Space Study

Historical and contemporary example of urban space.

Piazza del campo, St. Peters, Campidglio, St. Marco.

Yerba Buena garden, San Francisco, Pike place market, Seattle Washington.

Indian cases, particularly towns on bazaars & streets.

Module-3 Urban design Parameters

Space and place, morphology, urban form and structure, fabric, texture, grain, enclosure, human scale, complexity, etc.

Module-4 Basic Principles and Theories of Urban Design

Theories related to visual or perception aspect (Gorden Cullen)

Theories related to physical aspect (Kevin Lynch)

Theories related to social aspect (Jane Jacob)

(after understanding above aspect student will explain above theory on Indian space and context)

Module-5 Urban Design Details

Urban outdoor lighting, urban green infrastructure, acoustic consideration for urban fabric, air quality at street level.

REFERENCE BOOKS

8. Goden Cullen, the concise townscape.
9. Rob krier, urban space
10. Bernard tshumi, Manhattan transcript
11. Deependra Prasad, New architecture and urbanism,
12. John Lang, Architecture and Independence
13. Bill Hiller, Social logic of space
15. Jan gehl , Life between buildings: using public space
16. Jan gehl, Cities for people
17. Christopher Alexander, Public spaces public lifePattern language
19. Lewis mumford – city in history
20. Rapoport, amos history and precedent in environmental design
21. Rapoport, amos the meaning of built environment.
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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**BACHELOR OF ARCHITECTURE (B.ARCH)**
OBJECTIVES

- Sustainable architecture aims to create environment – friendly and energy efficient building by actively harnessing renewable nature sources of energy (solar energy etc.) and utilizing materials that least pollute the environment.
- The objectives include creating awareness of designing energy efficient building envelopes that respond to the climate of a place. Lighting of resource – efficient practices in India, advocating of the application of renewable energy system and the promotion of efficient lighting & HVAC system to reduce energy demand.
- Propose and evaluate strategies for improving the energy performance of buildings.

Module-1
Introduction to Sustainability
Sustainable development: Social, economic, environmental factors, ecological footprint, local and worldwide sustainable benchmarks. Energy consumption of buildings in the India; Need of energy efficient building in India.

Module-2
Sustainable design Principals
Principles and strategies - site design, energy management, renewable energy, Sustainable material selection, water management, indoor air quality, alternative Energy.

Module-3
Solar Energy and Buildings

Module-4
Energy Codes and Rating System
ECBC Code, LEED, IGBC, GRIHA, NBC, Internal load, ASHRAE 90.1 – compliance Paths.

Module-5
Building Envelope
Building envelope components- WALL, ROOF, FLOOR, DOOR, and WINDOW & SKYLIGHT. Role of envelope in building design for Energy efficiency.

Module-6
Energy Simulation – eQuest- Energy Programming and Modelling

REFERENCE BOOKS:
5. Green Building Guidelines: Meeting the Demand for Low-Energy, Resource Efficient
### CRITERIA FOR ASSESSMENT OF SESSIONALS

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**BACHELOR OF ARCHITECTURE (B.ARCH)**
BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); E–CONSERVATION

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OBJECTIVE:
- To understand what is heritage and its importance in terms of Architecture, structure, materiality and its significance in the evolution of the mankind in understanding nature and adapt and make its dwelling units respecting the nature and local climatic conditions.
- The overall goal is to conserve our rich heritage specially built heritage to showcase the richness of our Architecture, culture & society during various period of time and regime and promote conservation of our heritage for our future generations to see and learn evolution in building architecture and technologies during various time periods.
- Our main objective will be to document the heritage of our city and make guidelines, policies, conservation plans for built heritage structures, Heritage precincts and region with respect to its economic viability and spread awareness in the locals and institutions through workshops which will help in sustainable development of the societies.

Module-1 Introduction to Architectural Conservation
Definition of heritage, what is an historic building? Introduction to architectural conservation of buildings of importance – definition, nature, purpose and scope. Values in conservation; Ethics of conservation building conservation legislation etc.

Module-2 Defects in Heritage
Causes of defects and decay of a heritage structure. Natural agents of deterioration and loss.

Module-3 Preparatory Procedures for Conservation.
Preparatory procedures for conservation. Initial inspection, Continuing Documentation, Analysis of the documentation.
Role or need of documentation for the conservation & restoration of the any Heritage built form, Heritage precincts or any sort of tangible and Intangible heritage.
- Listing of the Region or Precincts for generating a data base of the heritage properties.
- Development of regional level maps for various types of heritages. (Heritage site maps, Heritage land-use maps).
- Buildings and Precincts typology study according to is usage, Architectural style, religion (study of demography and its comparison past and present) study.
- Building material, Construction techniques of Heritage structures in various typologies of buildings with respect to time.

Module-4 Introduction to International Charters
Introduction to various charters their significance and their role in guiding our conservation policies and guidelines or regional level and structural level (special reference to Barra and Venice charter).

Module-5 Literature Study and Site Visit
Literature case study of Red Fort (available on ASI web site) and site visit of ASI protected heritage buildings (in local city/town) and along with condition assessment techniques and methods.

REFERENCE BOOKS:
1. An introduction to conservation by Feildon B. M.
2. Conservation of Building by I. H. Harvey.
3. A critical bibliography of Building Conservation by Smith I. H.
## CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); F-PRODUCT DESIGN

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OBJECTIVES
- To give students basic understanding about Product and Industrial design process.
- The emphasis of the course is on group product design projects.

Module-1 Introduction
Definition of product design, design by evolution & design by innovation, essential factors, morphology of design, primary design phases and flow charting

Module-2 Product Strategies & Analysis
Standardization, industrial design organisation, role of aesthetics in product design, functional design practice, strength, stiffeners and rigidity considerations in product design

Module-3 Review Of Production Processes
Primary, machining & non-traditional machining processes, manufacturing requirements in design of machine components, design for forging, pressed components, casting & machining, designing with plastics, rubber, ceramics & wood

Module-4 Economic Factor and Anthropometrics Effecting Design
Product value, design for safety, reliability and environmental considerations, economic analysis, human considerations in product design, anthropometry.

Module-5 Product Development
Product development from concept to product designing for function, production, handling, use and maintenance

APPROACH
- Basic knowledge has to be given by the teacher through presentation or any other technique supplemented by student seminars to make it interactive.
- Product development: Selection of the projects is based on the possibility of user interaction leading to innovation. Projects end with a comprehensive presentation through working/mock up models, design drawing and a report.

REFERENCE BOOKS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 906, ADVANCED SERVICES

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OBJECTIVES

- To develop an understanding of the advanced building services and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

CONTENTS

Module 1 Gas Installation L.P.G / Bio-gas installations, their location and layouts in residential and non-residential buildings.

Module 2 Automated Parking System Introduction, Types, Working and Advantages of automated parking system.

Module 3 Mechanical Ventilation Standard requirements of ventilation for different conditions of living and works. Conditions for comfort. Control of quality, quantity, temperature and humidity of air.

Module 4 Control Room Code of Safety prescribed in NBC.


Module 6 Integrated Building Management System The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

SUGGESTED EXERCISES

- Site visits of buildings where different types of advanced services equipments have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of these systems and the location of their parts and how they will be connected.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCES

4. Building Automation Online by McGowan; McGowan, John J.
### CRITERIA FOR ASSESSMENT OF SESSIONALS

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 907, ADVANCED SURVEYING & GEOMETIC TECHNIQUES

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OBJECTIVES
- To develop knowledge and skills related to advanced surveying, photogrammetry, remote sensing and Geographic Information Systems (GIS) principles and practice.
- To impart knowledge about the basic principles of geomatics engineering techniques for data collection and mapping for planning infrastructural facilities, including various architectural applications.
- To provide basic knowledge of GIS, Remote Sensing, GPS theory and their applications using the existing state-of-the-art GIS software.

Module-1 Total Station Survey
Introduction, Working principle of total station and its use. Use of software for different applications.

Module-2 Photogrammetry
Definition, Principles and application of photogrammetry and stereoscopy in surveying.

Module-3 GIS (Geographic Information System)
Introduction to geographical concepts and terminology, Difference between Image Processing system and GIS, Utility of GIS. Raster and Vector Data - Introduction, Descriptions about Raster and Vector data, Raster Versus Vector, Raster to Vector conversion, Remote Sensing Data in GIS, Topology and Spatial Relationships, Data storage verification and editing. Data preprocessing, Geo-referencing, Interpolation of data, Database Construction, Data Output, GIS analysis functions, Generation of thematic maps, Digital Elevation Model (DEM), Introduction to software.

Module-4 Remote Sensing
Basics concepts of remote sensing, Electromagnetic spectrum, Platforms and sensors, Remote sensing data products, Introduction to visual and digital image interpretation techniques and image processing software, Field verification.

Module-5 GPS (Global Positioning System)
Introduction to GPS surveys, GPS data collection for mapping.

Module-6 Application
Application of geomatic engineering techniques to architecture and planning, Utility of high resolution remote sensing data for infrastructural planning, 3D visualization.

LIST OF ASSIGNMENTS (Practicals, Field Exercises & Drawings)
1. Preparing topographical map of given area using total station.
2. Study various aerial images.
3. Demo on various GIS software and their salient features. Practice on GIS for layers creation.
4. Customized application in GIS.
5. 3D GIS.
6. Use of remote sensing images for Landuse and landcover classification.
7. Use of GPS for taking field measurements.
8. Practice on Image Processing System to use remote sensing images.

REFERENCE BOOKS
1. Surveying Volume I & II by Dr. B.C. Punmia
2. Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
3. Surveying Volume -1 by Dr. K.R.Arora.

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23 | 9TH & 10TH SEMESTER SYLLABUS
OBJECTIVES

- To prepare a student to conduct in-depth study of one focus area of thrust emerging from architectural domains like structure, climate responsiveness, vernacular, architecture theory/philosophy, low cost construction techniques, parametric design and simulation, universal design, disaster management, green and intelligent buildings, advanced construction, services and materials etc. and form it as the basis of designing his/her thesis project proposal.
- To educate the student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
- To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.

INTRODUCTION

- The multiple challenges of ‘built environment’ offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a ‘live’ programme, as long as the topic can result in tangible ‘built environment’ solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic’s relevance to serve the laid down specific objectives inherent in the philosophy of the institution.
- For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution.
- Thesis I in 9th semester shall comprise of the research part of thesis in form of report part while the 10th semester shall carry forward the design stages in form of drawings.
- The Thesis report shall also consist of thrust area studies/research and all relevant contextual studies: of user, place and time to enable the formulation of design criteria and should be spiral bound for the thesis I submission.

Module-1 Stage I
Marks = 50

Selection and research of thrust area
Identification & brief Description of Literature/library/case studies to form background study.
Thesis Plan: Identifying aims and objectives (for implementing thrust area in subsequent design proposals), methodology, scope and limitations.

Module-2 Stage II
Marks = 50

Detailed Literature Review of selected Thrust Area/Issue forming the Design Criteria for Thesis Project.
All Literature and Library studies including prescribed standards for selected Thesis Project.
Selection of Site(s) for implementation of Thesis Project.
Selection of case Studies, along with criteria.

The Students will be expected to complete all Background Study for the Selected/Proposed Thesis Project before leaving for winter break when he/she will conduct extensive site studies and visit case / prototype studies for submission of Stage I in next semester.
BACHELOR OF ARCHITECTURE (B.ARCH)

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION OF THESIS AT EVERY STAGE
- There shall be one or more jury panels. Each panel shall consist of the following -
  ▪ Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution/ university.
  ▪ Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution/ university.
  ▪ Thesis Guide(s).
There shall be **two** juries/presentations for each student in order to assess Stage I and Stage II. Further the Thesis Coordinator(s) will act as facilitator.

COMPOSITION OF JURY PANEL FOR FINAL (EXTERNAL) EVALUATION / EXAMINATION OF THESIS.
- There shall be one or more jury panels. Each panel shall consist of the following -
  ▪ An Architect Director / Principal / Head of the Department / Professor of the parent institution / university.
  ▪ An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
  ▪ An eminent architect from the profession with at least 15 years of field experience.
  ▪ Thesis Guide(s) as member, but not part of evaluation.
Further the Thesis Coordinator(s) will act as facilitator.
OBJECTIVES

- To prepare a student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
- To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.

INTRODUCTION

- The multiple challenges of ‘built environment’ offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a ‘live’ programme, as long as the topic can result in tangible ‘built environment’ solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic’s relevance to serve the laid down specific objectives inherent in the philosophy of the institution.
- For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution.
- The Thesis report shall consist of all relevant contextual studies: of user, place and time to enable the formulation of design criteria.
- The design solution shall be in the form of drawings and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail.
- The report, in duplicate, shall be submitted in bound form together with prints/photographs of all the drawings and model/s.
- All relevant/pertinent drawings, sketches, models from previous stages to be put up for the jury to show evolution of design.

Module-1 Stage III Marks = 100
Summary of previous stages, Revised Design Criteria.
Detailed Case Studies identified for Thesis Project.
Detailed Site Studies and Analysis for implementation of Thesis Project.
Concept and Sketch Design through drawings and models.

Module 2 Stage IV Marks = 100
Finalised Sketch Design through well drafted double line plans, sections, elevations and models.

Module-3 Stage V Marks = 100
Design development in form of Site Plan(s), floor Plan(s), Sections and Elevations, Views and Working Models fully explaining the design, Structural Systems, Services Compliance.
Selection of Elective; Criteria, Objectives, Methods, Scope and Limitations.

Module-4 Stage VI Marks = 75
Developed working Drawings incorporating all structural systems, services and electives.

Module-5 Final (Internal) Marks = 75
Finalized Detailed Drawings complete with electives, 3Ds views, walk throughs and models with Final Thesis report

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION OF THESIS AT EVERY STAGE
- There shall be one or more jury panels. Each panel shall consist of the following -
  - Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution / university.
  - Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution / university.
BACHELOR OF ARCHITECTURE (B.ARCH)

- Thesis Guide(s).
There shall be five juries/presentations for each student in order to assess Stage I to Stage V. Further the Thesis Coordinator(s) will act as facilitator.

COMPOSITION OF JURY PANEL FOR FINAL (EXTERNAL) EVALUATION / EXAMINATION OF THESIS.
- There shall be one or more jury panels. Each panel shall consist of the following -
  - An Architect Director / Principal / Head of the Department / Professor of the parent institution / university.
  - An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
  - An eminent architect from the profession with at least 15 years of field experience.
  - Thesis Guide(s) as member, but not part of evaluation.
Further the Thesis Coordinator(s) will act as facilitator.
BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – X
RAR – 1002, PROFESSIONAL PRACTICE – II

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OBJECTIVES
- To familiarize the students with elementary knowledge of various instruments of legislation to safeguard the professional interest of architects as also societal interest.

Module-1 Law related to Land
Introduction to the Land Acquisition Act - 1894 and its subsequent amendments through Act of 2013 and 2015, a study of the LAND ACQUISITION AMENDMENT BILL 2018. Notification to acquire land under various sections, concept of public purpose, and compensation apportionment etc.
The Uttar Pradesh Urban Buildings (Regulation of Letting, Rent and Eviction) Act, 1972- Its important provisions and effect on the urban development.

Module-2 Urban Development Law
Introduction to the UP Urban Planning and Development Act-1973- Concept of Urban Development Authority its power authority and Role in regulating the urban development, Salient features of the provisions of the act.
The Uttar Pradesh Slum Areas (Improvement and Clearance) (Amendment) Act- 1981 and its important provisions for achieving.

Module-3 Law of Easement
Concept of Easement and essential elements of valid easement, creation of easement – types of Easement, Easement by prescription, Easement by necessity and quasi easement. Termination, suspension and revival of easement and other related concepts.

Module-4 Mercantile Law

Module-5 The Law of Environment
A general understanding of purpose, provisions, and the impact of various components of the environmental law e.g. The National Green Tribunal Act-2010; The Air (Prevention and Control of Pollution) Act- 1981; The Water (Prevention and Control of Pollution) Act- 1974; The Environment Protection Act, 1986; The Hazardous Waste Management Regulations, etc.

Module-6 Real Estate (Regulation and Development) Act, 2016 (RERA)
Concept of real estate, Need of the RERA and its impact on real estate, RERA authority, registration under the Act, Role and responsibilities and liabilities of architects under the provisions of the RERA.

APPROACH
- The spectrum of lectures will be covered through lectures citing practical examples. Specialist should supplement the courses through extension lectures.

REFERENCE BOOKS
1. Dr. Roshan H. Namavati, Professional practice
4. Madhav Devshaktu, Professional Practice
5. Governance of Societies under Multistoried buildings/housing

**CRITERIA FOR ASSESSMENT OF SESSIONALS**

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OBJECTIVES

- Seeking Responsive Forms of Pedagogy in Architectural Education.
- To develop students’ critical thinking abilities about the role of community involvement in different phases of the design process.
- To enhance students’ understanding of the core concepts, methods, and techniques that pertain to community design as they relate to different phases of the design process (programming, design, post occupancy evaluation), and as they relate to different types of environments.
- To understand the techniques of teaching a specialized course like architecture.
- The course would attempt encouraging students to evolve individual, creative yet pragmatic thought process.

Module-1 Introduction To Architectural Pedagogy
Understanding Pedagogy, Importance of Pedagogy, Role of Pedagogy in Architecture.
Nature of Interaction between teacher and students, Level of participation / involvement of both Educators and Students in various subjects / experiences. The routines of students and educators. The rules that govern the relationship between students and teachers.

Module-2 Instructional Methods and Techniques
Instructional Methods - Lecture method, Demonstration method, Case Study method, Project method, Programmed Instruction/ Learning, Studio method.
Instructional Media - Meaning, Need and importance, Projected media, Non-projected media, Computer Based multimedia.

Module-3 Field Studies in Architecture
Learning of various aspects of architecture through site visits. Understanding the methods of learning, observing and experiencing these aspects.
Preparation of report of the particular case study.

Module-4 Hands – on - Studios as a Tool for Learning
Development of exercises for various subjects in Architectural Studios.
Learning about programme making for the various studios and workshops.

REFERENCE BOOKS

REFERENCE WEBSITES
2. www.architectural-review.com/...pedagogies...architectural...

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BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – X
NAR – 1003, ELECTIVE – III (MISCELLANEOUS); B–MANAGEMENT& MARKETING SKILLS

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OBJECTIVES:
- To impart the students latest and relevant knowledge from the field of management theory and practice.
- To provide opportunities to the students for developing necessary managerial skills.

Module-1 Basic Concepts of Management
- Definition, Need and Scope, Introduction to Management Science, Theory & Practice, Environment of Management, Managers & Entrepreneurs, Managerial Roles & Skills, Manager's Social & Ethical Responsibilities.

Module-2 Functions of Management
- Planning – Concept, Nature, Importance, Steps, Limitations, Management by objectives

Module-3 Financial Management
- Cost of project, Means of finance, Estimates of sales and production, Cost of production, Working capital requirement and its funding, Profitability projections, Break Even Point(BEP), Projected cash flow statement, Projected balance sheet, Project profitability at market prices, Techniques of financial appraisal, Financial risk and over-all financial viability of the project through Internal Rate of Return (IRR)

Module-4 Marketing Management and Skills

Module-5 Marketing Environment and Planning
- Promotion decisions, Integrated Marketing communications concept, Communication tools, Contents of Marketing Plan, Developing Marketing Plan for variety of goods and services, Promotion decisions, Integrated Marketing communications concept, Communication tools, Personal selling & Sales management

REFERENCE BOOKS
1. Essentials of Management – Koontz – TMGH
2. Essentials of Management- Thomson Southwestern, Andrew J. Dubrin
4. Modern management: concepts and skills- Samuel C. Certo and Tervis Certo,
5. Principles and Practices of Management - Shejwalkar and Ghanekar
9. Principles of Marketing - Philip Kotler and Gary Armstrong
10. Fundamentals of Marketing - Stanton
11. Marketing Management – Rajan Saxena
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**OBJECTIVES:**

- To have an overview of the innovative concepts for future in terms of design, infrastructure and latest technology.
- To understand the limitations in terms of energy and area to build and sustain.

**Module-1 Theoretical and Imaginative Ideas**
Overview of the theoretical texts and drawings of the ideas by architects over the ages, who have imagined beyond today. E.g. Scholari, Archigram (Peter Cook), Raimund Abraham, Boullee, Ledoux etc.

**Module-2 Alternate Sustainable Ideas through Design and Technology**
Enumerating the varied innovative energy alternatives and their harnessing through design ideas, materials, techniques and functions.
Prefabrication as a basic module for building.

**Module-3 Social and Practical implications of a new world**
Comprehending the new social order, modes of transport, physical dimensions of an alternate world.

**Module-4 Futuristic Geometry**
Understanding a higher geometry (minimal surfaces) and its eventual spatial order.
Fractals, Fuzzy Logic in architecture.

**APPROACH:**
- Presentations would be made by the teacher. The students are expected to do library studies and seminars on varied topics to supplement the information base and make it more interactive.

**REFERENCE BOOKS:**
1. Fantasy Architecture: 1500-2036 [Neil Bingham, Clare Carolin, Rob Wilson, Peter Cook]
3. Futuristic : Visions of Future Living, Caroline Klien (Editor), Stefanie Lieb (Text by)
4. Future Architecture by Eduard Broto

**CRITERIA FOR ASSESSMENT OF SESSIONALS**

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BACHELOR OF ARCHITECTURE (B.ARCH)
B. ARCH. SEMESTER – X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); D–ARCHITECTURAL JOURNALISM

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OBJECTIVES
- To make students aware about Architectural Journalism
- To encourage them for Architectural writing, Documentation and Page Composition
- To familiarize students in preparation of Book Reviews and Articles.

Module-1 Introduction To Architectural Journalism
What is Journalism and why it is important?
Relation between Architecture and Journalism.
Looking at the ways design and the built environment are covered in the media today
Reading a broad range of contemporary and historical writings by journalists and critics and discuss how these stories reveal different approaches, attitudes, and biases in covering design.

Module-2 Introduction To Architectural Writing
Writing on different kinds of articles - from news stories to critical essays on particular buildings and social issues.
Sometimes students will report on buildings under construction and other times they will reflect on and criticize projects that are completed.
Learning how to gather information and do research for stories and then write various kinds of articles about built environment in Architecture, which will help them to understand the built environment and express their ideas on it.

Module-3 The state of Architectural Criticism
Introduction to Criticism and Importance of Criticism.
Relationship between Architecture and Criticism.
Reading the various articles from the magazines, newspapers and websites about the built environment to understand the criticism and social commentary. Failures of Architectural Criticism.
Analysis of various critical themes, and their comparison and learn how to criticize a built environment in various aspects and writing about criticism.

Module-4 Structure of Architectural Journals & Photo Journalism
Learning of documenting the collected information.
Formatting, page composition, editing write-ups, content writing.
Learning the techniques of clicking photographs through specific angles of built environment and their editing and modification.
Learning the technique of how the photographs are supporting the write-ups about built environment, to help them understand the expression of pictorial, verbal and visual relationship of architecture journalism.

Module-5 The Built Environment & How We Live Today?
Looking at and explaining a building in today’s scenario.
What’s happening now and what should be the future.
Read article and write an essay on recent projects.
Writing about the new technologies in today’s architecture and new construction techniques.

APPROACH
- Each week, students will have a reading and a writing assignment. Usually, readings will come from a newspaper, magazine, or website and students will have to respond with their own piece of writing. In class, everyone will discuss the readings and present their ideas about the topic in question.
- Students will be assessed by the quality of their writing, the level of understanding they bring to the readings and topics, and the quality of their in-class presentations and participation.
BACHELOR OF ARCHITECTURE (B.ARCH)

- Writing is a critical skill for all architects, one that they can use to communicate with clients, the public, and other Architects.

**REFERENCE BOOKS**
5. Architecture and the Journalism of Ideas by Bender, Thomas
6. Architectural Criticism and Journalism by Mohammad al-Asad w/ Majd Musa
7. Nieman Reports: *Architectural Criticism: Dead or Alive* by Blair Kamin.

**REFERENCE WEBSITES**
1. [http://niemanreports.org/articles/architecture-criticism-dead-or-alive/](http://niemanreports.org/articles/architecture-criticism-dead-or-alive/)
3. Architectural website, such as [archrecord.com](http://archrecord.com); [archpaper.com](http://archpaper.com); [archdaily.com](http://archdaily.com); and [dezeen.com](http://dezeen.com)
4. Grace Farms designed by SANAA, article in Architectural Record by [Naomi R. Pollock](http://archrecord.construction.com/)

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OBJECTIVES

- The knowledge and understanding of the universal and timeless qualities that identify all great art.
- To introduce the students to the importance of art in today’s world and the purposes art has served from pre-historic through modern times in a variety of cultures both western and oriental.
- To understand artistic intent and expression through basic element of art and architecture and to increase appreciation of art in today’s society.

Module-1  Introduction & Terminology

Module-2  Ideologies of Aesthetics in Art

Module-3  Development of Art
Development of art over the period of time. Tracking the progress in art in aspects of the Functional diversity of styles, Art as form of social consciousness, Impact of Cultural and Religion on art, Understanding the role of art in contemporary society.

APPROACH

- Presentation would be made by the teacher. The students are expected to do library studies and seminars (Reports, Tutorials and PPT’s) on varied topics to supplement the information base and make more interactive.

REFERENCE BOOKS
1. What Is Art For? (June 1, 1990) by Ellen Dissanayake.
5. Learning to Look at Modern Art by Mary Acton.
7. Art: Over 2,500 Works from Cave to Contemporary Hardcover – October 20, 2008 by Iain Zaczek and Mary Acton.
8. Aesthetics- YURI BOREV.
9. Approaches to Art in Education- LAURA H. CHAPMAN.
10. Panorama of the Arts- RUDEL.

CRITERIA FOR ASSESSMENT OF SESSIONALS

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OBJECTIVES

- To study the Evolution and Growth of Human Settlements
- To expose students to the development of Human Settlements in the Indian Context
- To Critically analyse learnings from development of informal and formal Human Settlements
- To discuss new and emerging concepts, methods and tools to face new challenges in built environment in Developing countries.

Module-1 Evolution and Development of Human Settlements
Origin and Growth of Human Settlements, River Banks as carriers to growth of Human Settlements; River valley Settlements: Greek, Roman, Medieval, Renaissance and Modern.

Module-2 Human Settlements in India
Human Settlements in India since the ancient to Medieval and Modern periods. Factor affecting their development and extinction: Socio-Cultural, Disasters and Environmental Aspects.

Module-3 Study and Analysis of Informal and Formal Settlements
Detailed Analysis of selected informal and formal human settlements in the world and India for deriving learnings for contemporary usage especially in the context of Efficient management of Resources, Solid Waste Management, Sustainability, Preservation of Cultural Practices.

Module-4 Establish criteria for contemporary Sustainable human settlements
A critical evaluation and discussion of new emerging concepts methods and tools, and cases like Masdar City, Auroville for upcoming challenges in human settlements for developing countries.

APPROACH

- Focus shall be on learning from growth and development of traditional human settlements.
- Aspects affecting their evolution and socio-cultural and other related aspects.
- Learning through case studies and literature studies along with relevant site visits shall be preferable.

REFERENCE BOOKS

3. The Evolution of Human Settlements from Pleistocene Origins to Anthropocene Prospects by Bowen, William M., Gleeson, Robert E.
5. Evolution of human settlements in India by S.P. Chatterjee

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OBJECTIVES
Students should be able to:
5. Apply energy and mass conservation principles in the analysis of energy performance of buildings;
   • Conduct design day and annual analysis of energy use in residential and commercial buildings;
   • Develop detailed building energy simulations using state-of-the-art building energy simulation software packages;
   • Propose and evaluate strategies for improving the energy performance of buildings.

Module-1 Introduction
Overview: Energy consumption of buildings in India; Need of energy efficient building in India

Module-2 Energy Simulation softwares
Software programs for energy simulation modeling (Ecotect, Energy Plus, Open Studio & Sketch Up, eQuest, Trnsys, IES/VE, DOE, TRACE).

Module-3 Energy Codes and Standards
ECBC Code, LEED, IGBC, GRIHA, BEE. ASHRAE 90.1 – compliance paths

Module-4 Internal loads in buildings
Plug loads, lighting, people, equipment. Schedules. Data resources for building sector energy use. Energy Use Intensity (EUI)

Module-5 eQuest- Energy programming and modelling

REFERENCE BOOKS
• Energy Simulation in Building Design, by J. Clarke
• Computerized Building Energy Simulation Handbook, by Waltz and Waltz
• Green Building Guidelines: Meeting the Demand for Low-Energy, Resource Efficient
• Contrasting capabilities of building energy performance simulation programs. Research Paper by Drury B. Crawley