

**B. Arch II SEM III
COURSE AR 301**

STUDIO III – Architectural & Basic Design

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| - | - | 10 | - | - | 250 | 250 | 10 | 500 | 500 |

Architectural Design SEM III

Emphasis: Developing an understanding of architecture as a process of creating an integrated functional, structural and spatial system

Contents: Design parameters like site context, functional requirements and inter-relationships, environmental conditions, evolution of form based on structural modules, Structure as an ordering mechanism, resolutions of built form with functional requirements as a major determinant, relevant case studies and their analysis, critical analysis of form-function of simple objects, application of colour psychology, understanding of light and shadows

Projects: Design of a small institutions of uni-functional nature eg. Café, Display gallery etc., relevant case studies and their analysis, literature review, detailed models as analytical tools, abstract sketches to represent basic nature of thought

References:

1. Ching, Francis D. K. – Form, Space and Order
2. Rasmussen, Stein Eiler – Experiencing Architecture
Ching, Francis D. K. – Visual dictionary of Architecture

B. Arch II SEM III
History of Architecture I (AR - 302)

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 3 | - | - | 2 | 50 | 30 | 20 | 3 | 50 | 100 |

Emphasis: Evolution of the built environment or human habitat as a complex and multilayered synthesis of 'culture, climate and construction'

Contents: Study of spatial order, structure and materials, articulations, symbols and meanings in the built forms at various scales of settlements, institutions and dwellings in the following time period:

Since the beginning of the civilization to 3rd Century AD

1. Introduction to History of Architecture
 - What is History? History as a social science or just a historiography?
 - Introduction to terminologies – folk, traditional, classical, vernacular etc.
 - Introduction to architectural terminologies – form, space, elements, structure, order, character, vocabulary etc.
2. Introduction to Vernacular Architecture as timeless ways of building
 - Shelter as a human need – Ascent of Man
 - Components of Vernacular – Architecture without architects
 - Synthesis of Culture, Climate, Construction – House Form & Culture
3. Ancient Civilizations: Indus Valley & Vedic Period, Mesopotamian, Japanese, Chinese, Mayan, Egyptian
4. Major Architectural Traditions in the West till the 3rd Century AD
 - Greek Architecture
 - Roman Architecture

Projects: Model making, Literature reviews, Assignments, Debates

References:

- A History of Architecture – Sir Banister Fletcher
- A History of Architecture – David Watkin
- A History of Architecture Vol 01 & 01 – James Fergusson
- Early India: From the origins to AD 1300 – Romila Thapar
- House form and Culture - Amos Rapoport
- Ascent of Man – Bronowski
- The Living House - Roxana Waterson
- Architecture without architects: A short introduction to non-pedigreed architecture - Bernard Rudofsky
- Living Architecture Series – Architecture of the World: Mayan, Egypt, Greece, Ancient Mexico, The Roman Empire

B.ARCH -II SEM-III
COURSE- AR-303
Building Material & Construction- III

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | 02 | 3 | 100 | 60 | 40 | 04 | 100 | 200 |

Emphasis: Understanding the construction technology involved in building components.

Content:

- Roofs:
 - Introduction to basic types of roofs such as flat, pitched and curved.
 - Basic understanding of flat roofs and its coverings.
 - Construction details & materials involved in various types of pitched roof system.
 - Types of roof coverings and their application.
 - Basic understanding of curved roof structures.
- Floors:
 - Construction details & materials involved in various types of floors
 - Different floor finishes and their application.
- Walls:
 - Different types of walls and their Construction details
 - Various types of wall finishes, like plastering, painting, cladding, jointing, & pointing etc and their applications.
- Staircases:
 - Types & construction details of staircases in different materials.
- Openings:
 - Different types of doors, windows, ventilations and skylights in different materials. and their operational and fixing details.
- Types & details of building elements like weather shed, balcony, canopy & pergolas.

Projects: Study through practical site visits, presentations, case studies & workshop based on the application of theory to construction field.

Reference:

1. Mackey W.L -Building Construction, Vol –I,II,III,
2. Arora S.P. & Bindra S.P. -Building Construction
3. Barry .R - The Construction of Building
4. Cowan Henry J -Handbook of Architectural Technology
5. Allen Edward -Fundamentals of Building Construction
6. Roof construction Manual

YEAR – II, SEM - III

Structure -III , (Course : C 304)

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 03 | - | 02 | 3 | 100 | 60 | 40 | 05 | 100 | 200 |

Emphasis : **Analysis & Design of structures.**

Contents : **1. Bending stress :**

Theory of simple bending, Assumptions, calculation of bending stresses for simply supported beams & cantilever beam of various cross sections. Flitched beams, calculation of bending stress for flitched beam, beams of uniform strength.

2. Shear stress :

Calculation of shear stress for simply supported & cantilever beams of various cross sections like T, L, I, O, Rectangle, Hollow sections etc.

3. Deflection :

Introduction, Definition, importance, Deflection of a simply supported, cantilever & continuous beams using various methods of analysis.

4. Effect of seismic force on bending, shear & deflection :

Understanding of Reversal of stresses due to earthquake.

5. Direct & bending stress :

Combined direct & bending stresses, eccentric loading, middle third rule, Core & kernel, application, stability of masonry wall, dam etc.

6. Column :

Theory of column under axial loading, behaviour of column, Slenderness ratio, short ,medium & long column, buckling of column, effective length, ,Calculation of load carrying capacity using Euler's & Rankine's formulae.

7. Moment distribution method :

Concept of method, Assumption, stiffness , carry over & distribution factor, Analysis of fixed & continuous beams by moment distribution method, Drawing of moment diagram.

8. Load bearing structure with & without effect of seismic force :

Introduction to load bearing structure & Frame structure, understanding of various parameters like material, size, slenderness ratio, effective height & length, opening etc. governing the strength of structure, Use of nomogrammes to find the thickness of load bearing wall.

Effect of earthquake on load bearing structure, Earthquake engineering, basic terms & definition like amplitude, frequency, natural frequency, resonance, oscillation, focus,

epicentre, behaviour of structure under earthquake, Effect of mass, understanding of basic principal $F = ma$, IS code provision for load bearing structures subjected to earthquake forces, detailing of masonry load bearing structure.

- Project** : 1. Tutorial based on course contents.
2. practical in lab based on course contents.

- Reference** : 1. Junarkar & H.J. Shah, "Mechanics of structures , vol – I & II."
2. E.P. Popov, "Mechanics of materials."
3. R.K. Bansal, "A text book of strength of materials."
4. R.S. Khurmi, "Strength of materials."
5. S. Ramamrutham, "Strength of materials."
6. B.C.Punamia, "Analysis of structure."
7. IS 13828-1993, "Improving E.Q. resistance of low strength Masonry building-Guidelines."
8. IS 13827-1993, "Improving E.Q. resistance of earthen buildings, Guidelines."
9. National Building code of India.

B. ARCH – II SEMESTER – III
COURSE – AR 305
History of Culture III

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|-----------|-----------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: Study of social, political and religious orders; articulation in built forms, socio – cultural milieu, scales of settlements, institutions and dwelling.

Contents:

A. World History:

- African Civilization.
- Japanese traditions and Civilization.
- Medieval Period in Europe.
- Rise and Spread of Renaissance.
- Rise and Expansion of Islam.

B. Indian History:

- Gupta Period.
- Temple Architecture and Hindu Cosmology, Iconography.
- Islam as a political, religious force in India.
- Religion and its articulation in architecture and sacred building forms with special emphasis on Christianity and Islam.

References:

1. World Religions – The Illustrated Guides, General Editor – Micheal Coogan, DBP, London.
2. Cambridge History and Culture of the Indian People, Vol. – VI and VII.
3. A History of Architecture, Spiro Kostof, Oxford University Press, New York.
4. Domestic and Public Architecture of Italy, D. M. Robinson, Baltimore.
5. History of Indian Architecture; Christopher Tedgell.
6. Ascent of Man; J. Bronowski.

**B.Arch. II SEM III
Climatology (AR 306)**

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|-----------|--------------------|-------|-------------------|--------------------------------|-----------|-----------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | 01 | 2 | 50 | 30 | 20 | 03 | 50 | 100 |

Emphasis : Climatology and its influence on built environment.

Contents : 1) Study of various Climate and issues of ecological balance
 2) Study and analysis of Climatic forces (sunlight, wind, precipitation, heat, Sound, etc.)
 3) Climatology and Site analysis, microclimate, urban Climate.
 4) Properties of building materials in relation to climatic forces.
 5) Thermal Control and Climate Control device.
 6) Various applications related to climatic consideration for architectural design.

Exercises : Study of traditional/ vernacular built environment and its efficiency with respect to climate.

References :
 1. Manual in tropical Architecture, O. Koinesberger

B. ARCH – II SEMESTER – III

Surveying and Leveling (C 307)

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | 01 | 2 | 50 | 30 | 20 | 03 | 50 | 100 |

Emphasis:

General understanding of various methods of surveying.

Contents:

1. Introduction, term, definition and general terminologies, classification and Division of survey, units of measurements.
2. Chain Surveying: Linear measurement, principle, frame work, instruments, field work, booking correction for chain, plotting a survey.
3. Compass Survey: Travers, principle, theory, instrument, commutation of angles from beating, local attraction.
4. Theodolite: Fundamental lines, terms, definition, essential parts, horizontal and vertical angles.
5. Plain Table Survey: Instruments and methods.
6. Area Measurements: trapezoidal, Simpson's formula, use of planimeter.
7. Levelling: Terms, definition, theory, instruments, calculation of RL by HI and rise and fall method, introduction of various methods of leveling.
8. Contouring: Terms, characteristics of contour, method of locating and interpolating contours, study and use of contour map.
9. Volume Measurements: Prismoidal formula, trapezoidal formula, using contours, study and use of contour map.
10. Methods for setting out buildings by horizontal and vertical control.

Project:

Field Work:

1. Plotting of building, boundary and other details by chain survey, compass survey, plain table survey, theodolite.
2. Determination of RL by leveling exercise.
3. Area measurement by planimeter.
4. Study of contour map and earth work calculation.

Reference:

1. Surveying, Dr. B. C. Punamia
2. Surveying, Kanetkar and Kulkarni

B. Arch II SEM IV COURSE AR 401

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| - | - | 10 | - | - | 200 | 200 | 10 | 400 | 400 |

STUDIO IV – Architectural Design

Architectural Design SEM IV

Emphasis: Evolving an appropriate design for specific users and context

Contents: Program formulation on the basis of functional needs and users' requirements, understating site context, environmental conditions, social life and cultural values as determinants of architectural design, developing conceptual positions based on the interpretations of the program, developing systems of construction and material details relevant to the conceptual positions, development of functional and aesthetical construction details and fenestration design

Projects: Design of a dwelling unit based in a specific context, relevant case studies and their analysis, area volume diagrams, literature review, exercises and time problem to develop innovative thinking, exercises related to relevant or appropriate construction details and materials

References:

1. Lieklider, Health – Architectural space
2. Analysis of the Precedents
3. Todd, Kim – Site, Space and Structure
4. Miers , Pierr Von – Elements of Architecture from form to place
5. Blaser, Werner – Tadao Ando: Architecture of silence

B. Arch II SEM IV History of Architecture II (AR 402)

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 3 | - | - | 2 | 50 | 30 | 20 | 3 | 50 | 100 |

Emphasis: Evolution of the built environment or human habitat as a complex and multilayered synthesis of 'culture, climate and construction'

Contents: Study of spatial order, structure and materials, articulations, symbols and meanings in the built forms at various scales of settlements, institutions and dwellings in the following time period:

3rd to 13th Century AD

India

- Evolution of Hindu/ Jain Temple
- Architecture of Palaces/ Forts

West

- Early Christian
- Romanesque
- Gothic

Others

- Introduction to Middle East
- Buddhist Architecture : Japan, China, India

Projects: Model making, Literature reviews, Assignments, Debates

References:

- Meaning in Western Architecture – Christian Norberg-Schulz
- A History of Architecture – Sir Banister Fletcher
- Architecture Through the Ages – Talbot Hamlin
- A History of Architecture : Settings and Rituals – Spiro Kostof
- Architecture : From Prehistory to Post-Modernity – Trachtenberg and Hyman
- Early India: From the origins to AD 1300 – Romila Thapar
- The Hindu Temple (Vol 01 and 02) - Stella Kramrisch
- Hindu Architecture – Henri Sterlin
- Indian Architecture – Adam Hardy
- The History of Architecture in India - Christopher Tadgell
- Indian Architecture (Hindu and Buddhist) - Percy Brown
- Living Architecture Series – Architecture of the World: Hindu India, Romanesque, Gothic

B.ARCH -II SEM-IV
COURSE- AR-403
Building Material & Construction- IV

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 2 | - | 2 | 3 | 100 | 60 | 40 | 4 | 100 | 200 |

Emphasis: Soil property and specialized foundations.

Content:

- Soil investigation, its properties & its application to foundation design.
- Study of specialized deep foundation including raft, piles ,caissons & cofferdams
- Study of retaining walls.
- Shoring, shuttering, scaffolding & underpinning.
- Study of various construction equipments and formwork relevant to the components.
- In depth study of construction stages and application of technology as a whole for any building.

Projects: Study through practical site visits, presentations, case studies & workshop based on the application of theory to construction field.

Reference:

1. Mackey W.L -Building Construction, Vol –I,II,III,
2. Arora S.P. & Bindra S.P. -Building Construction
3. Barry .R - The Construction of Building
4. Cowan Henry J -Handbook of Architectural Technology
5. Allen Edward -Fundamentals of Building Construction

YEAR – II, SEM - IV
Structure -IV , (Course : C 404)

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|-----------|---------------------|-------|-------------------------|-----------------------------------|-----------|------------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 03 | - | 02 | 3 | 100 | 60 | 40 | 05 | 100 | 200 |

- Emphasis** : **Design & detailing of R.C.C. elements.**
- Contents** :
- 1. RCC as a material :**
Introduction to R.C.C., different grades of concrete & steel, factors affecting strength of concrete i.e. strength of material, water to cement to ratio, workability, compaction, types of aggregates, methods of curing, introduction to mix design.
 - 2. Introduction to IS code :**
Introduction to various load & load combinations, Use of IS code for loads, Introduction to 456-2000 for design of RCC element
 - 3. Methods of design:**
Introduction to limit state, working stress & ultimate stress methods, Determination of Moment of resistance of homogeneous beams of rectangular under reinforced, over reinforced & balanced sections by limit state method.
 - 4. Analysis & design of Doubly reinforced beam :**
Analysis & design of doubly reinforced section -T & L type of beams.
 - 5. Other limit states :**
Design criteria for deflection, shear, development length & anchor length.
 - 6. Design of Slabs :**
Design of slabs spanning in one & two direction for various support conditions
 - 7. Design of Waist Slab :**
Staircases of different types, Design of waist slab for a simple dog legged stair, behaviour & detailing of other types of staircase slabs .
 - 8. Designing a structural grid for a simple small house with ductile detailing:**
Understanding of supporting various elements- slabs , beams & columns as per architectural drawing, study of grid pattern for deciding column position, designing various elements for earthquake force, Calculation of Earthquake forces, ductile detailing of flexural elements as per IS 13920-1993.
- Project** : 1. Design of various elements with drawing based on course

content.

2. site visits & case studies.
3. study of structural grid.
4. Material study :
 - Casting & testing of concrete cubes by varying water to cement ratio & grades.
 - Study of various parameters affecting strength of concrete.
 - Basic tests for cement , i.e. setting time test, consistency test etc.
5. Design of a small building using software for the various load combinations.(Dead load, live load, wind load, earthquake load)

Reference :

1. H.J.shah, “ Reinforced concrete, Vol- I.”
2. S. ramamrutham & S. Narayan, “ Design of reinforced concrete structures.”
3. Sushil Kumar, “Treasure of R.C.C. Design.”
4. Shah & kale, “ R.C.C. Theory & design.”
5. A.M. Neville, “ Properties of concrete.”
6. IS 456-2000, “ design of RCC elements.”
7. IS 13920-1993,“Ductile detailing of RC structures subjected to seismic forces”
8. IS 875 –1987, Part I to V.

B. ARCH – II SEMESTER – IV

**COURSE – AR 405
History of Culture IV**

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|-----------|-----------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: Society, culture and their expansion of Arts; development of order, thought and Philosophy; Resultant changes in society; material and non - material cultures.

Contents:

A. World History:

- Ideology and Social orders in 18th and 19th Century Europe.
- Industrialization / imperialism and resultant upheavals in society and culture.
- Inter War year, advent of modernism.

B. Indian History:

- The Delhi Sultanat.
- The Mughal Period.
- Early Colonial.

A. Introduction to Movement / Genres in Art, architecture, Literature.

- Italian High Renaissance.
- Baroque – Spain, Flanders.
- Romanticism.
- Symbolism.
- Realism.
- Inter War Culture.
- Rise of Modernism.

References:

1. The Seven Cities of Delhi.
2. The Third War.
3. Art and Civilization, Edward Smith, Lawrence King.

B-Arch-II Semester-IV
Course AR 406
Building Services-I

| Teaching Scheme (No. of Contact hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------|--------------------------------|---------|-------|-------------|
| Theory | Tutorials | Studio | Theory Exam | | Practical | | | | |
| | | | Duration - Hours | Marks | End Semester Exam | Continuous Internal Evaluation | | | |
| 02 | - | 02 | 3 | 100 | 60 | 40 | 04 | 100 | 200 |

Emphasis: Introduction to all basic building services:
Water supply, Sanitation, Electrification

Content: **1. Water Supply:**

- Sources of water, Water treatment techniques, requirements of water supply to different types of buildings, modes and methods of conveyance of water, fixtures and appurtenances, distribution of water, methods of distribution, different distribution systems and their principles of layout, design of water distribution systems in a campus and in the building, underground and overhead water tanks.
- Brief description of rainwater harvesting and water table recharging techniques.

2. Sanitation:

- Refuse, different form of refuse: garbage/solid waste, sullage, toilet waste, storm water, their collection and disposal systems. General principles of drainage.
- Drainage layout for building premises, kitchen, utility and toilet layouts, fixtures and fittings; W.C. flushing valves, flushing tanks, wash basins, bathing accessories.
 - Types of traps: floor traps. Gully traps etc; manholes, grease chambers, curb inlets and gutter inlets, inspection chambers, intercepting traps.
 - Ventilation of drains and sewers, principles of design of sewer lines, longitudinal sections of drains.
 - Rain water drainage pipes, spouts, sizing of rain water pipes, storm water drainage system.
 - Drainage in nonmunicipal areas, soak wells septic tanks

- Sewage treatment techniques: biogas plants
- Specialized water supply and drainage requirements: swimming pools, basement level, terrace gardens etc.

3. Electrification:

- Lighting in buildings, light and its sources, lighting criteria, the visual field, day lighting prediction methods
- Artificial lighting levels for various activities, calculations for lighting levels, illumination.
- Lighting accessories, protective devices, different types of lamps.
- Electrical distribution system in building, mains and sub-distribution switches and controls. Layout for lighting, fans, telephones, intercoms, T.V; video etc.
- Underwater lighting (swimming Pools, fountains etc)

Projects:

1. On site studies
2. market surveys of different water supply and drainage pipes, fittings and fixtures, electrical accessories.

References:

1. Elements of public health engineering by Duggal
 2. Text Book of sanitation by R.S. Deshpande
 3. Text Book of sanitary engineering by S.R.Kshirsagar
 4. National Plumbing Code (AWWA)
 5. Water supply and drainage by Bhide
 6. Time saver standardsfor architectural design data by Calaendar
 7. Heating cooling, lighting by Norbert Lechner
- Electrical wiring estimating and costing-Uppal

B.Arch. II Sem IV
Elective I
Ar 407A - Passive Solar Architecture

| Teaching Scheme (No. of Contact Hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------------|--------------------------------------|---------|-------|----------------|
| Theory | Tutorials | Studio | Theory Exams | | Practical | | | | |
| | | | Duration- Hours | Marks | End Semester Exam | Continuous internal evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: Understanding the implications of Solar Energy on the built environment and how can it be used positively in the built form design to reduce energy consumption and produce an energy efficient design.

Content:

1. Solar Radiation, Solar Energy, solar gains and thermal mass.
2. Principles of Passive Solar architecture –
3. Advanced Passive Solar techniques – Direct Gain, Thermal storage wall, Thermal storage roof, roof radiation trap, Solarium, Isolated gain,
4. Passive cooling concepts- Evaporative cooling, Nocturnal radiation cooling, Passive desiccant cooling, Induced Ventilation, Earth sheltering, Wind tower, Earth-air tunnels, Curved roofs and air vents, insulation.
5. Day Lighting
6. Application and examples from the traditional architecture.
7. Design Considerations / Guidelines for various climatic zones.
 1. Orientation
 2. Lighting
 3. Thermal Comfort
 4. Materials and construction techniques

Project:

1. Case studies and analysis of a site specific built form with regard to passive solar architecture.
2. Design exercise – To design/ redesign/ incorporate passive solar architecture in a built form.

References:

1. Manual on Solar Passive Architecture; Energy Systems Engineering, IIT Bombay, Mumbai & Solar Energy center, Ministry of Non-conventional energy sources, GOI, New Delhi
2. Passive Solar House Book, the Hawkweed group
3. Solar Dwelling Design Concepts, by AIA Research Corporation, Washington, DC.
4. Improving Energy Efficiency in Buildings -A Management Guide, Dennis R. Lensberg & Ronald Sturat

B.Arch. II Sem IV
Elective I
Ar 407B – Application of Computers in Architecture

| Teaching Scheme (No. of Contact Hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------------|--------------------------------------|---------|-------|----------------|
| Theory | Tutorials | Studio | Theory Exams | | Practical | | | | |
| | | | Duration- Hours | Marks | End Semester Exam | Continuous internal evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: Development of skills in Using computer as a tool for architectural drawing and presentation environment

Content: Introduction to software useful to prepare technical as well as presentation drawings with broad perspectives of 2D and 3D visualization.

Project:

1. Preparation of presentation drawings and measure drawings (dimensioning)
2. 3D perception of drawings

References: - Virtual Architecture, Zampi Giulians & Morgan Conway L.
 - Software Users Guide

B.Arch. II Sem IV
Elective I
Ar 407C – Advanced Photography

| Teaching Scheme (No. of Contact Hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------------|--------------------------------------|---------|-------|----------------|
| Theory | Tutorials | Studio | Theory Exams | | Practical | | | | |
| | | | Duration- Hours | Marks | End Semester Exam | Continuous internal evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: To create understanding and know how for various practical and professional use of photography techniques to explore the potential application in the field of architecture.

Contents:

1. Landscape Photography
2. Material Photography
3. Architectural Photography
4. Use of computer tools / software for photographic presentation

Projects: 1. On site Photography of a building / landscape / materials to understand the use of natural and artificial light

References: 1. The Handbook of Photographic equipment & techniques, Adrian Holloway
 2. Photo Topics and Techniques, Eastman Kodak Company
 3. Masters of Photography, Beaumont And Nancy Newhall
 4. Architectural Photography, Joseph W. Molitor
 5. The world of Henry Cartier Bresson, Henri Cartier Brasson

B.Arch. II Sem IV
Elective I
Ar 407D –Graphics in Architecture

| Teaching Scheme (No. of Contact Hours) | | | Examination Scheme | | | | Credits | Total | Grand Total |
|---|-----------|--------|--------------------|-------|-------------------------|--------------------------------------|---------|-------|----------------|
| Theory | Tutorials | Studio | Theory Exams | | Practical | | | | |
| | | | Duration- Hours | Marks | End Semester Exam | Continuous internal evaluation | | | |
| 02 | - | - | 2 | 50 | 30 | 20 | 02 | 50 | 100 |

Emphasis: To develop graphical presentation skills in the students and understanding of compositions and presentation skills.

Contents:

1. Materials and Medium Exploration for graphics
2. Presentation techniques through reproducing drawings master architects' works
3. Art-isms – A history of art to comprehend Art and Architecture.
4. Colour Theory- To understand the application of colours in space perception as well as presentation

Projects:

1. Reproduction of Master Architect's works with different Media
2. Mono Printing on Papers / Textures
3. Composition / presentation exercises in various Medias.

Reference:

1. The art of color, Johannes Ihen
2. Architectural Graphics, Francis D.K Ching
3. Design Drawing, Francis D.K Ching
4. Drawing- Creative Process, Francis D.K Ching
5. History of Modern art, H.H. Arnason
6. Art Today, Edward Smith
7. Monotype, Julia Ayres.