

SYLLABUS CONTENT OF I SEMESTER B. ARCH.
21AT11 ARCHITECTURAL DESIGN – I (PC)

Contact Periods / week: 8 (02 lecture + 6 Studio)	CIE (Continuous Internal Evaluation): 50
Credits: 6	SEE (VIVA): 50

Objective:

To develop the ability to translate abstract principles of Design into Architectural solutions for simple problems

Outline:

- About Architecture education, profession and its relation to other fields, such as engineering, science, mathematics, philosophy, religion etc. ----- (3 Sheets)
- Understanding local architecture through observation, sketching silhouettes, experiencing the local monuments in terms of space, enclosures and materials. ----- (3 - 5 Sheets)
- Forms and space exercises to understand its various outcomes through organization of forms such as Additive forms, deductive forms, rhythmic, balancing, symmetrical, grid, clustered forms. ----- (Models)
- Concepts of volume & scale width to height ratio – various ratios ----- (2 Sheets + Models)
- Anthropometry – Human body and function relation ----- (1 - 2 Sheets)
- Understanding the relation between human function & space requirement movement & activity placement, spatial interpretation through design of activity rooms. Such as living room, Bedroom, Kitchen, Dining room, bus stop, watchman kiosk, lawyer's office, doctor's clinic ----- (6 Sheets + 3 Models)

Assignment:

Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

Course Outcome:

With the application of basic principles of design the student will be able to design a mono function space for comfortable use.

Reference:

1. 'Principles of Three Dimensional Design' by Wucius Wong
2. 'Principles of Two Dimensional Design' by Wucius Wong
3. 'Principles of Color Composition' by Wucius Wong
4. "Form, Space and Order" by Francis D.K.Ching
5. "Design Fundamentals in Architecture" by Parmar VS
6. Manual of graphic techniques Vol I, II, III by Tom porter & Bob Green Street
For Architects Graphic Designers & Artists

21AT12: BUILDING CONSTRUCTION & MATERIALS – I (BS&AE)

Contact Periods / week: 5 (2 lecture + 3 Studio)	Continuous Internal Evaluation: 50
Credits: 4	SEE (Theory Exam 4 hrs. duration) marks: 50

Objective:

To understand the different components of building & basic materials, and construction techniques.

Module1.

Introduction

- Introduction to various components of building, their definition and functions.
- Introduction to the conventional methods adopted in construction drawing and use of scale.
- Simple strip foundation brick & stone wall.
- Simple strip (continuous) foundation in brick for different wall thickness (half, one and 1½ brick thick walls).
- Simple strip (continuous) foundation in stone for different soil bearing capacity.
- Foundations: Types of foundations (Conventional), trenches (Earthwork) for excavation, dry soling, foundations for different types of soils and functions of foundations.

Module2.

Bricks & Stone:

- Types, properties and manufacturing methods & uses of bricks for aesthetic & structural purpose.
- Types, properties and uses of stone for aesthetics & structural purpose
- Lime: Properties and uses in building
- Cement: Types of Cement, their applications, manufacturing process, laboratory and field tests.
- Sand: Properties and uses in buildings.

Module3.

Brick Wall

- Brick wall- wall construction in English and Flemish Bond in half, one and one & half Brick thick wall.
- L- joint, T- joint, piers, coping, buttresses.
- Introduction to Cavity Walls, types.

Module4.

Stone & other Walls

- Rubble stone masonry walls – UCRS, CRS, Ashlar.
- Composite wall – Combination of brick and stone wall.
- Concrete block and light weight concrete aerated block wall.
- Stone retaining Walls.

Module5.

Arches & Lintels

- Basic terminology used in arches
 - Types of brick arches, stone arches & lintels.
 - Detailed drawing of following brick & stone arches
- a. Flat arch

- b. Semi- circular arch
- c. Segmental Arch
- d. Elliptical arch
- e. Equilateral arch

Studio Work: Sheets on

- Components of building, Convention and scale used in construction, Brick wall, stone wall, concrete wall, Foundation in brick and stone, Different type arches in brick and stone

Course outcome:

- The course will enable the student to understand the actual execution of buildings on the site, practically and also enable the students to learn detailing of foundation, masonry work & also represent them in the form of drawing.

Reference:

- "Building Construction" by W.B.Mackay
- "Construction Technology" by Chudley
- "Construction of Building" by Barry
- "Building Constructon" by Rangawala
- "Building Constructon" by Punmiya

21AT13: GRAPHICS – I (PC)

Contact Periods/week: 5 (2 lecture + 3 Studio)	Continuous Internal Evaluation: 50
Credits: 4	SEE (Theory exam, 4 hrs duration) marks: 50

OBJECTIVE:

To introduce the students, the fundamental techniques of architectural drawings by practice on drawing board by conventional method.

OUTLINE:

Module - I

Introduction to the basic principles of drawing, sign conventions & Line types.

Lettering used in architectural drawings as per Bureau of Indian standards.

Practice in Lettering, its importance & different fonts.

Use of standard lettering and styled lettering. ---- (2 Sheets)

Module - II

Graphical presentation on architectural drawings of – Building Materials, Landscape elements, Furniture etc. ---- (2 Sheets)

Measure Drawing of Simple Furniture ---- (2 -3 Sheets)

Module - III

Plane Geometry:

Introduction to Plane geometry: exercises in lines & angles, construction of triangles, quadrilaterals & regular polygons. ---- (2 Sheets)

Construction of plane curves: Ellipse & Oval & methods of drawing them ---- (1 Sheet)

Arches: typical arch forms (ex: segmental, semicircular, three centered, four centered arches) & methods of drawing them ---- (1 Sheet)

Module - IV

Orthographic Projection: (first angle projection):

Principles of orthographic projection & projection of the following in different positions with respect to HP & VP

- points,
- lines,
- planes &
- Solids ---- (3 - 4 Sheets)

Module – V

Three-dimensional representation of Solids:

Isometric projection of solids-

- Simple Objects – Cube, Pyramid, Cone, Sphere & Cylinder
- Combination of Simple Objects ---- (3 - 4 Sheets)

Assignment: Module wise Assignments need to be given after completion of each module and to be evaluated immediately.

Course Outcome: The Student will be able to visualize the Objects in both 3-D & 2-D form and represent the same in Architectural drawings.

Reference:

1. IS 962 for Architectural graphics standards
2. “Engineering Drawing” by N D Bhat
3. “Geometrical Drawing for Arts Students” By IH Morris
4. “Engineering Drawing Vol. I and II” by KR Gopalkrishna
5. “A primer on computer aided engineering drawing” by VTU
6. Architectural Rendering techniques of contemporary presentation by Albert o Halse

21AT14 - HISTORY OF ARCHITECTURE - I (PC)

Human Settlements–Ancient Civilizations

Contact Periods / week: 3 (3 lecture)	Continuous Internal Evaluation: 50
Credits: 3	SEE (Theory Exam, 3 hrs duration): 50

Subject Objective: To provide an insight into the architecture of prehistoric period and early civilizations. Social, religious and political character, construction methods, building materials and how they influenced their built form and settlement patterns shall be explained with suitable examples. Combined influence of geology, geography, climate, beliefs, religion and culture on the architecture must be highlighted so as to appreciate how architecture embedded in places specific context. The student must enable students to do a comparative evaluation of various civilizations, appreciate chronological developments along the timeline and across geographies.

Module-I.Prehistoric/Primitive Architecture

Primitive people, shelters, settlements, burial systems, megaliths and memorials. Eg: Oval huts near Nice, Dolmen tomb, Gallery grave, Passage grave, Cairns, Tumulus, Houses at Catal Huyuk, Stonehenge etc.

Module-II.NileValleyCivilisation

Study of socio-cultural, religious and political systems, people's beliefs, climate and other factors influencing Architecture, character of human settlements, typology of Shelters and buildings, Religious burial systems and Cult temples of Egypt, construction methods and materials used.

Module-III.IndusValleyCivilisation

Contributions of Archaeologists, Timeline, socio-cultural, religious and political systems, settlement planning pattern, typology of Shelters and civic buildings, Citadel-Granary-Great baths, civic utility systems.

Module-IV.Aryan/VedicCivilisation

Timeline with reference to Indus Valley Civilisation, settlement planning pattern and Town forms by planning pattern (Dandaka, Nandyavarta etc.), typical Vedic village, shelter types by shape and material used, Torana and Sacred railings.

Module-V.EuphratesandTigrisValleyCivilisations

Architectural character as a reflection of climate and geology, planning of Palaces of Assyria and Persia, Ziggurats and corbelled drains of Assyria, Staircases of Persepolis, physical planning of Babylonia, Ur-Sumer. eg. evolution of Pyramids, pyramid of Cheops, ziggurat at UR.

Course outcome:

Students are able to understand the origin, evolution and enable to do a comparative evaluation of various civilization & developments & principles of Architecture in historical periods.

References:

1. "History of Architecture" by Sir Bannister Fletcher
2. Prehistory to post modernism by Marvin & Isabel
3. Brown, P. (2010). *Indian Architecture: Buddhist and Hindu period*. Mumbai: D.B. Taraporevala Sons and Co.
4. Bhabbar, D.K. (2005). *The Spirit of Indian Architecture*. New Delhi: Rupa & Co.
5. Copplestone, T. and Lloyd, S. (1971). *World Architecture: An Illustrated History*. London: Verona Printed.
6. Crouch, P.D. (1985). *History of Architecture: Stonehenge to Skyscrapers*. London: McGraw-Hill.
7. Kimball, F. and Edgell, G.H. (2012). *A History of Architecture*. Amazon: Ulan Press.

8. Faulkner, H.T. (1953). *Architecture through the Ages*. New York: Putnam Adult.
9. Fletcher, B. (1996). *A History of Architecture on the Comparative Method*. 20th Ed. 11. London: B.T. Batsford Ltd.
10. Grover, S. (2003). *Buddhist and Hindu Architecture in India*. 2nd Ed. New Delhi: CBS Publishers.
11. Harris, M.C. (1977). *Illustrated Dictionary of Historic Architecture*. New York: M. Courier Dover Publications.
12. Ingersoll, R. And Kostof, S. (2013). *World architecture: a cross-cultural history*. Oxford: Oxford University Press.
13. Pramar, V.S. (2005). *A social history of Indian architecture*. New Delhi: Oxford University Press India.
14. Roth, M.L. (2006). *Understanding Architecture: Its Elements, History, and Meaning*. Columbia: West-view Press.
15. Sen Gupta, B.K. (2006). *Reading material on History of Human Settlements*. New Delhi: ITPI.
16. Singh, U. (2009). *A history of ancient and early medieval India: from the Stone age to the 12th century*. Delhi: Pearson India.
17. Watkin, D. (2005). *A History of Western Architecture*. 4th Ed. London: Laurence King Publishing.

21AT15 – STRUCTURES – I (BS & AE)

Contact Periods / week : 3 (3 lecture)	Continuous Internal Evaluation: 50
Credits: 3	SEE (Theory exam, 3 hrs duration): 50

Objective: - Introduction to Structural systems. Structural materials, Principles of mechanics and different force system.

Module-1

Structural systems Overview: Study of function, purpose, behavior of elements and advantages of advantages of various structural systems like Load bearing structure, Framed structure, Arch structure, Shell, Folded plate, Cable, Space frames, Geodesic dome, Parabolic structure, Pneumatic structure, Membrane structure.

Module-2

Structural Materials: Study of Structural materials with emphasis on mechanical properties, suitability, Advantages and disadvantages viz. steel, wood, concrete, glass, aluminum, Fabric.

Loads on structures: Study of various types of loads, the structure is being subjected to as per IS 875 Part I and Part II and load combinations considered for structural design.

Module-3

Mechanics - Classification of mechanics, Scalar and vectors, force, characteristics of force, classification of force system, Composition and resolution of forces, Principles of transmissibility, law of superposition, Resultant of coplanar concurrent force system, and Free body diagrams.

Module-4

Moment of force, couple and its characteristics, Varignon's principle, Resultant of coplanar non-concurrent force system,

Module-5

Equilibrium of Forces: Equations of equilibrium, Conditions of equilibrium, principles of equilibrium for different force systems, equilibrant, Law of superposition, Lamis theorem, Numerical problems on equilibrium of forces.

Course outcome: -Students will be able to understand various structural systems, materials, loads and basic principles of mechanics

REFERENCES:

- 1) R.K.Bansal, " A Textbook of Engineering Mechanics", Laxmi Publications, 2008
- 2) S.S. Bhavikatti, " Engineering Mechanics", New Age International, 1994.
- 3) S. Ramamrutham, " Engineering Mechanics ", Dhanpat Rai Publishing, New Delhi, 2016
- 4) Structure in Architecture, the building of buildings, by Mario Salvadori
- 5) Structure and design, by G.G Schierle

21AT16 BASIC DESIGN

Contact Periods / week: 5 (1 lecture + 4 Studio)	Continuous Internal Evaluation: 50
Credits: 4	SEE (Viva marks): 50

OBJECTIVE:

To develop an understanding Elements and principles of design in abstract and to train the Mind and hand, for perception and to develop a series of compositions eventually terminating to a design study.

OUTLINE:

To understand the design elements and principles like -

- Point:
- Line:

2D & 3D exercises on line ----- (1 Sheet & 1 Model)

- Shape:

Compositions on regular & irregular shape ----- (2 Sheet & 2 Models)

- Role of Texture in Composition:

Study of texture from nature, composition on handmade textures and textured materials ----- (2 Sheets & 1 Model)

- Color:

Color wheel - primary, secondary, tertiary color, Tints and shades & natural colors

Warm, Cool, Masculine, Feminine, Tranquil color etc ----- (3 Sheets)

- Volume: Exercise on plane manipulated to a form ----- (3D Model study – 2 Models)

Design principles like -

- Harmony & Contrast: in shape size and color and texture.
- Symmetry & Balance: symmetrical and Asymmetrical balance
- Anomaly: Exercise to break monotony & create a focal point
- Radiation: composition on superimposition and radiation- center of radiation, multiple centers
- Rhythm
- Datum
- Solids & Voids
- Proportion & Scale
- Concentration:

Exercises on both negative and positive spaces ----- (only Models on above principles)

ASSIGNMENT: Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

COURSE OUTCOME:

The student will be capable to think out of the box & achieve beauty through its principals.

REFERENCES:

1. Principles of form & design by Wucius wong
2. Arts and ideas by, Flemming William
3. Foundation of Art and design by, Ar. Pranav Bhatt, Ms. Shanita Goenka

21AT17 - ARCHITECTURAL MODEL MAKING (PC)

Contact Periods / week: 3 (1 lecture+2studio)	Continuous Internal Evaluation: 50
Credits: 2	SEE (Practical marks): 50

OBJECTIVE:

To train the students in basic skills of Architectural model making with different scale, material and proportion

OUTLINE:

1. Model making of geometrical objects such as cube, cuboids, pyramid, cone dome, by using wax, box board, soap, pop, foam board etc.
2. Preparing space models and tensile forms or membrane structures using steel wires, plastic or wooden sticks, etc. Use of wax, metal wire, fiber, cloth and Plaster of Paris
3. Preparation landscape elements such as trees, shrubs lawns, rocks, water bodies out of different materials –Sponge, wool, cotton and paper etc
4. Making forms out of paper through origami, kirigami
5. Model coloring using sprayer, brush or any other aid
6. Block model making and elevations in paper print attached to wall to suitable scale along with landscape
7. Interior model making of 2 to 3 rooms with furniture, wall, flooring, lighting colored and made to detail to suitable scale.

ASSIGNMENT: Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

COURSE OUTCOME:

Skill of model making will be developed in the student.

REFERENCES:

1. Ching F. D. K (2009), Architectural Graphics, John Wiley & Sons
2. Chriss B. M (2005), Designing with models, A Studio guide to Architectural Process Models, John Wiley & Sons
3. Werner M. (2201), Model Making, New York, Princeton Architectural Press

21AT18 – COMMUNICATION SKILLS (SEC)

Contact Periods / week: 2 (2 lecture)	Continuous Internal Evaluation: 50
Credits: 2	SEE (Viva marks): 50

Objective:

To enable the students to develop skills in effective communication both in written & verbal.

Outline:

Module - I

- **Introduction:** Meaning, Definition, Importance & Purpose of Communication, Process of Communication, Types of Communication, Communication network in an organization, 7c's of communication, Barriers to Communication & Essential of good Communication.
- **Oral Communication:** Meaning, Principles of successful oral communication, barriers to communication. Modes of oral communication – listening as a communication skill, Non-verbal communication. Grapevine Communication – Meaning & Types.

Module - II

- **Effective writing:** Purpose of Writing, Clarity in writing, Principle of Effective writing, writing personal Experiences – Describing a person, situation, memorable events etc.
- **Drafting of Letters:** Writing different types of letters - writing for employment, joining letter, complaints & follows up, Enquiries, representation etc. Official Communication – e-mail & social media.

Module - III

- **Presentation Skills:** What is a Presentation? – Element of Presentation – Designing & delivering Presentation. Public Speaking, Effective Power Point presentation, body language, Non-verbal facial expressions, Eye Contact, audience research, questions from the audience, communication of emotional intelligence, creativity in oral communication. Communication through telephonic, video conference & Skype.

Module - IV

- **Employment Communication Skills:** Writing Curriculum Vitae (CV), Interview – Types of interview, Candidates Preparation, Interviews Preparation, Time Management, Grooming & Just A Minute (JAM). Speaking for better communication – speaking about yourself.

Module - V

- **Interpersonal Communication Skills:** Advantages & Disadvantages of utilizing the team work, Characteristic of Successful teams, Stages of the development of a team, team roles, challenges in team working, forms of Non- Team behavior.

Assignment: Assignments need to be given after completion of each chapter and to be evaluated immediately.

Course outcome:

The students will be able to communicate effectively using verbal, visual and electronic modes and media.

References:

1. Prasad P, Communication Skills, S. K. Kataria & Sons.
2. Business Communication – K. K. Sinha, Galgotia Publishing Company, New Delhi.
3. Murphy – Effective Business Communication, Mc Graw Hill
4. Mc. Grath- Basic Managerial Skills, New Delhi, Prentice Hall India learning pvt. Ltd.

21AT21 – Architectural Design – II (PC)

Contact Periods / week: 8 (2 lecture+6 Studio)	Continuous Internal Evaluation: 50
Credits: 6	SEE (Viva marks): 50

Objective:

To understand the grammar of creation of space and form with its variables.

Outline:

- Understanding the relation between space, form, light, colour, skin & structure.
- Circulation / movement as consideration in setting the function
- Influence of above elements on space & form and its further transformation to suit to the function
- Representation of resultant form in Architectural language in two dimensional drawing. Design based on different Professions such as student's own residence, Doctors, Painters, or Lawyers residence or weekend form house, Tree house, Boat house may be taken.
- More emphasis to be given to understanding the creation of form & space through models and its further transformation

Assignment:

Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

Course outcome:

Student will be capable of designing a simple house with consideration of variables

Reference:

1. "Time Saver Standards for Architectural Design Data" by John Hanock,
2. "Architectural Graphic Standard" by Ramsay and Sleeper.

21AT22 - BUILDING CONSTRUCTION & MATERIALS - II (BS&AE)

Contact Periods / week: 5 (2 lecture + 3 Studio)	Continuous Internal Evaluation: 50
Credits: 4	SEE (Theory Examination 4 hrs): 50

OBJECTIVE:

To acquaint the students with different types of doors and windows and contemporary construction practices pertaining to roofing System.

Module I:

- Doors – Types & joinery details of wooden Doors, i.e., paneled, flush and glazed doors, study of joinery details.
- Mesh Doors.

Module II:

- Windows – Types & joinery details of wooden windows i.e., paneled, glazed, French window, dormer window, bay window.
- Mesh Windows.
- Ventilator – Glazed, wooden ventilators.

Module III:

Roofs in timber

- Study of different types of wooden roofs, definition and function of different parts.
- Simple trusses in timber, construction details, fixing of roofing materials i.e., A. C sheets, G. I sheet, clay-tiles etc.)

Module IV:

Timber staircase and flooring.

- Types of staircases (Wooden)– Dog -legged, open well and circular staircase with details.
- Timber flooring – construction details of timber flooring.

Module V:

Wood and Glass

- Introduction to wood, types , uses and application in buildings.
- Uses of wood: Commercial wood in building i.e. plywood block boards, particle boards, veneers and laminates and other types, manufacturing process in brief, their properties and application.
- Introduction to glass, manufacturing process in brief, properties, types, uses & application in buildings.

Assignment:

Module wise Assignments need to be given after completion of each module and to be evaluated immediately.

Course outcome:

Student will be able to design doors, windows, roofs flooring & staircase of timber for any given project with all details pertaining to timber.

Reference:

1. "Building Construction" by W.B. Mackay
2. "Construction Technology" by Chudley
3. "Construction of Building" by Barry
4. "Building Construction" by Rangawala
5. "Building Construction" by Punmiya

21AT23: GRAPHICS – II (PC)

Contact Periods/week: 5 (2 lecture + 3 Studio)	Continuous Internal Evaluation: 50
Credits: 4	SEE (Theory exam, 4 hrs duration) marks: 50

OBJECTIVE:

To introduce the students to the fundamental techniques of architectural drawings and to enhance their visualization skills by practice on drawing board by conventional method

OUTLINE:

Module I:

Section of solids of simple geometric objects (like prism, pyramid, cone & cylinder) in different positions & true shapes of sections ---- (3 Sheets)

Module II:

Development of surfaces of simple geometrical objects (of prisms, pyramids, cylinder and cone) ---- (3 Sheets)

Module III:

Inter-penetration of geometric solids of simple geometrical objects (prism with prism, cylinder with cylinder, cone with cylinder, cylinder with prism) ---- (3 Sheets)

Module IV:

Perspective – principles and visual effects of three-dimensional objects

Study of picture plane, station point, vanishing point, eye level, ground level, their variation and their resultant effects.

One point & two-point Perspective drawings of simple geometrical objects (like pyramids, cubes prisms, cylinders, cones and their combinations) & built forms. ---- (5 Sheets)

Module V:

Sciography Study of Shades and shadows

Principles of drawing shade and shadow with source of light is sun.

Sciography for simple geometrical forms on vertical, horizontal and inclined planes

Applications on Simple geometrical objects (like cube, cube with a niche, prisms and pyramids etc. and their combinations) built form & perspective views---- (5 Sheets)

Assignment:

Module wise Assignments need to be given after completion of each module and to be evaluated immediately.

Course Outcome:

Ability to capable of imagination of the object in 3-dimensional form in different angles shade & shadows.

Reference:

- 1 “Engineering Drawing” by N D Bhat
- 2 “Geometrical Drawing for Arts Students” By I H Morris
- 3 “Engineering Drawing Vol I and II” by KR Gopalkrishna
4. “Perspective” by SH Mullik

21AT24 - HISTORY OF ARCHITECTURE - I (PC)
Human Settlements-II: Classical & early Medieval period (700 BCE–1000 CE)

Contact Periods / week: 3 (3 lecture)	Continuous Internal Evaluation: 50
Credits: 3	SEE (Theory Exam, 3 hrs. duration): 50

Subject Objective: To provide an insight into the architecture of Classical antiquity & early Medieval period. Social, religious, political and architectural character, construction methods, building materials and settlement planning shall be explained with suitable examples. To provide an understanding of the evolution of Classical architecture in the west, Indian Architecture in its various stylistic modes characterized by technology, ornamentation and planning practices. Combined influence of geology, geography, climate, beliefs, religion and culture on the architecture must be highlighted so as to appreciate how architecture is embedded in place-specific context. The student must enable students to do a comparative evaluation of developments in a chronological manner along the timeline and across different geographies. Also, students must be enabled to appreciate tangible and intangible aspects of heritage associated with history.

Module-I. Classical Architecture-Greek Architecture and Roman Architecture

Study of principles of design, proportion, Optical corrections and Classical Orders. Building types viz.

Classical-Greek architecture –Doric, ionic, & Corinthian orders, optical corrections,, Temple of Parthenon.,

Roman architecture-Tuscan & composite orders, Temple of Pantheon, Sanctuaries, Thermae, Amphitheatres, Circus, Aqueducts etc. Study of planning principles adopted, Agora, Forum and their effect on settlement planning

Module-II. Early Christian Architecture

Study of Architectural character, evolution of Church form, building typologies, and building elements, polychrome architecture, Baptisteries, early Basilican churches; settlement planning, and fortifications systems.

Module-III. Buddhist Architecture in India

Study of religious philosophy, resultant evolution of building typologies, building elements and associated forms during Hinayana and Mahayana phases. Types of structures and elements developed eg: Stupa at Sanchi, Chaitya hall at Karli, Vihara at Ajanta, Stambhas, Toranas, sacred railing etc. in India. Study of form variations across various countries.

Module-IV. Indo Aryan Architecture

Development of fortification, walled towns, settlement patterns and the causative factors. Role of Shilpaśāstras and Arthaśāstras in settlement planning. Study of worshipping places in Indo Aryan/Nagara style, design of buttressed shikharas, rock-cut and structural examples of temples.

Evolution of Hindu temple - Both Indo Aryan & Dravidian

Ex: Early temples at Udaygiri & Sanchi

Module-V. Early Dravidian Architecture

Development of fortification, walled towns, settlement patterns and the causative factors. Role of Shilpaśāstras in settlement planning. Study of worshipping places in Dravidian

anstyle[, Early Chalukya,Pallava, Chola, Pandya etc.),designofGopuramandShikhara,Hindu,BuddhistandJaincaveandrock-cuttemplearchitecture.

Hindu Architecture- Early Chalukyan

Experiments at Badami, Aihole & pattadakal

Ex: Badami Caves. Durga Temple & Ladkhan temple at Aihole, Virupakshatemple at pattadakal;

Pallavas – *Ex: Rathas & Shore temple at Mahabalipuram,*

Cholas - *Ex: Brihadeshwar temple at Tanjore*

Pandyan – Gopurams

Jain Architecture: salient features

Ex.chaumuka temple at Ranakpur

Course outcome:

Students are able to understand early civilization & religious architecture of India. Also, students must be enabled to appreciate tangibleandintangibleaspectsofheritageassociatedwithhistory

References:

- 1.“Indian Architecture, Buddhist & Hindu Period” by Brown, Percy
- 2.“Architecture of India-Buddhist & Hindu” by Grover, Satish
- 3.“History of Architecture in India” by Christopher, Tadgell
- 4.“Hindu India” by Sterlin, Henri
- 5.Brown,P.(1983).*IndianArchitecture(IslamicPeriod)*.Bombay:TaraporevalaandSons.
- 6.Catherine,A.(2001).*ArchitectureofMughalIndia*.CambridgeUniversityPress.
- 7.Faulkner,H.T.(1953).*ArchitecturethroughtheAges*.NewYork: PutnamAdult.
- 8.Grover,S.(2002).*IslamicArchitectureinIndia*.NewDelhi:CBSPublications.
- 9.Harris,M.C.(1977).*IllustratedDictionaryofHistoricArchitecture*.NewYork: M.Courier Dover Publications
- 10.Hillenbrand,R.(1994).*Islamicarchitecture- form,functionandmeaning*.Edinburgh:EdinburghUniversityPress.
- 11.Ingersoll,R.AndKostof,S.(2013).*Worldarchitecture:across-culturalhistory*.Oxford:OxfordUniversityPress.
- 11.Mitchell,G.(1978).*ArchitectureoftheIslamic world-itshistoryand socialmeaning*.London :ThamesandHudson.
- 12.Nath,R.(1985).*HistoryofMughalArchitectureVolsI-III*.NewDelhi:AbhinavPublications.
- 13.Tadgell,C.(1990).*TheHistoryofArchitectureinIndia*.NewDelhi:PenguinBooks.

21AT25 – STRUCTURES – II (BS & AE)

Contact Periods / week: 3 (3 lecture)	Continuous Internal Evaluation: 50
Credits: 3	SEE (Theory exam, 3 hrs. duration): 50

Objective: - Introduction to concept of support reaction, friction, centroid and moment of inertia of different geometrical figures.

Module-1

Beams and support reactions: Types of supports, loads and beams, free body diagram, Numerical problems on support reactions.

Module-2

Truss: Types of trusses, concept of triangulation, Common truss configuration, calculation of dead weight of the truss and roof cover and support reaction loads.

Module-3

Friction- Introduction, Definition, types of friction, Co-efficient of friction, angle of response, Laws of dry friction, numerical problems on friction.

Module-4

Centroid of Plane figures: Centre of gravity, centroid, Centre of gravity of a plane figure, Axis of reference, derivation of centroid of regular figures viz. Rectangle, square, triangle, semicircle, quarter of a circle, Numerical problems on calculation of centre of gravity of simple combinations and cut-out or punched out areas.

Module-5

Moment of Inertia of plane areas: Introduction, Polar moment of inertia, radius of gyration, parallel axis theorem, perpendicular axis theorem, derivation of moment of inertia of regular figures viz. Rectangle, circle, triangle, semicircle, quarter circle, numerical problems on calculation of moment of inertia of simple combinations and cut-out or punched areas.

Course outcome: - Students will be able to understand the concept of support reactions ,friction and also capable of calculating centroid and moment of inertia of different geometrical figures.

REFERENCES:

- 1) R.K.Bansal, " A Textbook of Engineering Mechanics", Laxmi Publications, 2008
- 2) S.S. Bhavikatti, " Engineering Mechanics", New Age International, 1994.
- 3) S. Ramamrutham, " Engineering Mechanics ", Dhanpat Rai Publishing, New Delhi, 2016
- 4) Structure in Architecture,the building of buildings, by Mario Salvadori
- 5) Structure and design, by G.G Schierle

21AT26 SURVEYING AND LEVELLING (BS&AE)

Contact Periods/Weeks: 3 Hrs. (1 Lecture+2 Practical)	CIE Marks: 50
Credits: 2	SEE Marks: 50 (Practical)

Objective: - To develop the knowledge and skill relative to surveying and levelling principles and practice

Module-1

Introduction to surveying: Definition, classification, Principles and objective of surveying,

Chain Surveying: Chain and its types, instruments used in chain surveying, field book Practical's to be conducted on types of ranging and construction of geometrical figures.

Module-2

Compass surveying: Definition of bearing, types of bearing, local attraction, prismatic compass and its parts

Practical's to be conducted on different methods of traversing

Module-3

Plane table survey: Accessories used, advantages and disadvantages, different methods of plane table surveying

Practical's to be conducted on radiation and intersection method of plane table surveying.

Module-4

Levelling and Contouring: Definition, types of levelling, temporary adjustments of dumpy level, calculation of RL by HI method and Rise and fall method. Characteristics of contours, methods of contouring, uses of contours.

Practical to be conducted on simple levelling, profile levelling, differential levelling, calculation of height of chejja.

Module-5

Practical to be conducted on Setting out of center line marking of a simple building for excavation.

Course outcome: -Students will be able to understand the basic principles of surveying and different methods of surveying in terms of theory and practice.

REFERENCES:

- 1) B C Punmia, " Surveying Volume I", Firewall Media, 2005
- 2) K R Arora,"Surveying " Standard Book House,7th edition.
- 3) R. Subramanian, " Fundamentals of Surveying and Levelling", Oxford Uni. Press., 2014.
- 4) S K Duggal," Surveying", Vol 1, 14th Edition, McGraw Hill Education, 2013.
- 5) TP Kanetkar, SV Kulkarni, "Surveying and Levelling (Part-1)", PuneVidyarthi Griha Prakashan, 2014.

21AT27 Computer Applications in Architecture-I (SEC)

Contact Periods/Weeks: 3 Hrs (1 Lecture+2 Practical)	CIE Marks: 50
Credits: 2	SEE Marks: 50 (Practical)

Objective:

To develop Architecture drafting skills using computer

Outline:

- Role of computer in Architecture, preparation of 2D drawings using digital media use of software such as Auto Cad or Rivet.
- Learning commands
- Line weight scale, forming layers, blocks and references etc.
- Proper filing & organization of drawings

Assignment:

To prepare 2D, simple architectural problem using software.

Course Outcome:

The student will be capable of drafting architectural drawing using computer/ digital media.

Reference:

1. Reference manual of Auto Cad

21AT28 Visual Arts (PC)

Contact Periods/Weeks: 3 Hrs. (1 Lecture+2 Studio)	CIE Marks: 50
Credits: 3	SEE Marks: 50 (Viva)

OBJECTIVE:

To give an artistic orientation to the students to enable the transition from their purely scientific background and to develop fundamental artistic skills for application in architectural drawings.

OUTLINE:

Part A

- Freehand drawings and simple perspective in object drawing and drawing use of various drawing and sketching tools like pencils, ink pens, charcoal pencil etc. drawing, shading etc.
- Exercises in freehand drawing of household furniture, street furniture, human beings and automobiles, trees etc.
- Study of object drawing and nature with light and shade
- Rendering – use of rendering tools and materials like easels, brushes, paper (handmade, drawing sheet), water color etc.

Part B

- Working of art, type of arts – visual, performing, pop etc.. appreciation of art form
- Relationship of Architecture with arts like, painting, sculpture, mural, color, fine arts, performing arts, folk art etc.

Assignment: Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

Course Outcome:

It helps the students in transforming the 2D shape into 3D form with the use of different techniques & materials of Art. The student will be capable of relating art with architecture in their projects.

Reference:

Visual Art: A Basic Study by Gajanan Bhagwat, Arvind Desai
Visual Design: A problem solving Approach by Lillian Garrett