

## SECOND SEMESTER

### AR 17B2.1C ARCHITECTURAL DESIGN – I

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L/s: 9/Wk Int: 200 End Exam: 200 Total: 400 End Exam: 5 hrs Cr: 9

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#### Course Overview:

This course is intended to provide framework for understanding design as a process.

#### Objectives of the Course:

Simple space organization starting with single activity to multifunctional spaces.

Spaces responding to human anthropometrics

#### Expected Outcome:

To understand principles of design. To develop the ability to translate abstract principles of design into architectural solutions for small problems.

#### Course Contents:

##### Unit - I

Anthropometrics: Basic -average measurements of human body in different postures-its proportion and graphic representation, application in the design of simple household and street furniture. Use of mannequins in defining spatial parameter of design.

##### Unit - II

Study of functional spaces and the issues like clearances, lighting and ventilation, furniture arrangements; Minimum and optimum areas for various functions; Detailed study of spaces such as living, dining, bedrooms, kitchen, toilet, etc.

Study of the human considerations like, privacy, convenience, comfort, etc.; Case study of a house and a critical appraisal of the spaces.

##### Unit - III

Introduction to design process. Pre- Design Studies: Preparation of design brief, the user requirement and their implications, Study of the site and the context;

Design Response: Development of concept, Graphic tools like circulation diagrams, Figure Ground studies, etc. Integration of form and function in the design of an enclosed object/space using the materials studied. e.g. Security cabin, grocery store, caravan, bus shelter, milk booth, traffic police kiosk, flower stall, ATM Center, etc.

##### Unit – IV

Listing of important local buildings and understanding the reasons for their importance.

Listing and Drawing silhouettes of favourite buildings or places.

Observing the built environment around and experiencing enclosures (field trips)

Local stories on architecture.

Introduction to basic development of forms: additive form, deductive form, rhythm, contrast, balance and symmetry.

Concepts of volume and scale, width to height ratio.

Study models to explore the design principles. Multiple sectional drawings of study models.

At least two major exercises and two minor design/time problems should be given. The final submission shall necessarily include a model for at least one of the two main problems.

*To give the learning in this subject a more practical orientation seminars by industry or trade related organisations or field/site visits should be organized. A weightage of 5% in the overall Internal Assessment in the subject should be reserved for students attending these seminars/site visits and maintaining the records/observations as required by the subject faculty.*

**Reference books:**

**Chiara Joseph de and Others.** Time Savers Standards of Building Types. McGraw – Hill, 1980.  
**Kirk, Paul Hayden and Sternberg, D. Eugene.** Doctors Offices and Clinics, 2<sup>nd</sup> ed. Reinhold Pub., USA, 1960.  
**Neufert, Ernst.** Ernst Neufert Architects Data, Granada Pub. Ltd., London, 1970.  
**Pevsner, Nikolaus.** A History of Building Types. Thames and Hudson, London, 1976.  
 Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub. Co., New Delhi, 1996.

**AR 17B2.2C ARCHITECTURAL DRAWING AND GRAPHICS – II**


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*L/s: 4/Wk    Int: 50    End Exam: 50    Total: 100    End Exam: 5hrs    Cr: 4*

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**Course Overview:**

The course is intended to develop the techniques of architectural drawing pertaining simple and complex solid geometrical forms of Building geometry Sciography and Documentation.

**Objectives of the Course:**

To impart the skills of three dimensional visualization and presentation.

**Course Contents:****Unit – I**

Orthographic Projections (first angle projection): Principles of orthographic projection; projections of points, lines, planes –all combinations; Orthographic projection of solids; Orthographic projection of architectural built elements and built forms: (with increasing complexity)

Building Geometry: Study of points, lines, and planes leading to simple and complex solid geometrical forms; Representation of 3D elements in Plan and Elevations

Use of circle in mouldings and arch forms - Ovolo Covetta, Ogee, Lancet, Horse shoe, Moorish, Stilted and Rampant, Tudor, three

centered and drop. Exercises on Ionic volute, Entasis of column etc., working with models to facilitate visualization.

**Unit –II****Sciography:**

Simple and composite forms, shadows on horizontal, vertical planes and on their own surfaces. Study of shade and shadows of simple geometrical solids of various forms and groups of forms.

Shade and shadow techniques leading to advanced practical examples: shades and shadows on buildings or parts of buildings. Relative changes in building shades and shadows with sun angle, time, building height. Introduction to sciography in perspective.

**Unit-III****Architectural Documentation:**

Detailed measured drawing and documentation of any interesting historical or modern building – preparation of maps, plans, elevations, sections, views etc.

**Reference books:**

**Thoms, E. French.** Graphic Science and Design, New York: MC Graw Hill.  
**Nichols, T.B. and Keep, Norman.** Geometry of Construction, 3rd ed. Cleaver – Hume Press Ltd., London, 1959.  
**Bhatt, N.D. and Panchal V.M.** Engineering Drawing: Plane and Solid Geometry, 42nd ed. Charotar Pub., Anand, 2000.  
**Gill, P.S. T.B.** of Geometrical Drawing, 3rd ed. Dewan Suhil Kumar Kataria, Ludhiana, 1986.  
**Shah, M.G., Kale, C.M. and Patki, S.Y.** Building Drawing: with an integrated approach to built environment, 7th ed. Tata McGraw Hill Pub., Delhi, 2000.  
**Claude Batley:** Design Development of Indian Architecture  
**Ernest Burden:-**Architectural Dilineation

## AR 17B2.3C BUILDING CONSTRUCTION – II

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*L/s: 4/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 5hrs Cr: 4*

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### Course Overview:

The course introduces to the methods and techniques of construction of doors and windows, stairs and partitions of a building using different materials.

### Objectives of the Course:

To understand the elementary and simple construction methods like joinery details in wood, fixing of hardware.

### Expected Skills / Knowledge Transferred:

To understand the techniques of constructing doors and windows, staircase and partitions using different materials

### Unit – I

Carpentry and joinery: Terms defined; mitring, ploughing, grooving, rebating, veneering. Various forms of joints in wood work, such as lengthening joints, bearing joints, halving, dovetailing, housing, notching, tusk and tenon etc;

### Unit – II

Doors: Definition of terms, types of doors: wooden, ledged, ledged and braced, paneled, flush door. Hinged, single and double shutters, sliding, folding, revolving, pivoted.

### Unit – III

Windows: Casement, top and bottom hung, pivoted and sliding sash, UPVC doors and windows.

Hardware: fixtures, locks, hinges, fastenings for doors and windows.

### Unit – IV

Steel: windows, rolling shutters and grills. Aluminium doors and windows.

### Unit – V

**Partition Walls:** Various types of glazed and wooden partitions and paneling; Sound proof and light weight partitions; Brick partition, reinforced brick partition, brick nogged partition, lath and plaster partition, pre-cast concrete partition, glass block and glass create partition, common wooden partition, trussed partition.

### Unit – VI

Staircases: Principles of staircase construction and its elements; Terms defined, Tread, riser, stringer, nosing, flight, landing, head room, handrail, balusters, newel post etc., types of stairs i.e., straight, doglegged, open well, geometrical, circular, spiral, bifurcated, wooden stairs, stone stairs, metal stairs and elementary knowledge of R.C.C. stairs. Details of various staircases in wood, stone, steel and RCC.

### Unit – VII

Flooring & Flooring finishes: Various natural and manufactured materials: Types of Stone flooring: Granite, Marble, Kota, Shahbad (Limestone), Flagstone, Wooden Flooring, Ceramic and Vitrified Tiles. Concrete floors, Brick on edge, Indian patent floor, granolithic, terrazzo, pitch mastic, Magnesium Oxide, Chloride.

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### Reference Books

**Barry, R.** The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.

**Bindra, S P. and Arora, S P.** Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.

**Hailey and Hancock, D.W.** Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.

**Moxley, R. Mitchell's** Elementary Building Construction, Technical Press Ltd.

**Rangwala, S.C.** Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.

**Sushil Kumar. T.B.** of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

## AR 17B2.4C BUILDING MATERIALS – II

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*L/s: 2/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 3hrs Cr: 2*

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### Course Overview:

The course is intended to provide information on the properties, uses, installation and costs of building materials. The course highlights on Mechanical and physical properties of various materials. Influence of various factors on these properties. Causes of defects, their prevention and remedies. Testing of materials.

### Objectives of the Course:

To provide knowledge on the various types of building materials used while highlighting the current innovations and trends.

### Expected Skills / Knowledge Transferred:

Knowledge required for specifying appropriate materials for various spaces in buildings.

### Course Contents:

#### Unit – I

**Laminates and Veneers:** Resin bonded ply wood, types of laminates, laminated wood, insulating boards and other

miscellaneous boards, veneers from different varieties of timber, their characteristics and uses MDF& HDF Boards.

#### Unit – II

**Paints and Varnishes:** Protective coating, paints, constituents of paints, their functions, water paints, distempers, and cement based paints, emulsion paints, selection of paints, and storage of paints.

**Types varnishes** (oil and spirit): characteristics and uses of varnishes. French polish, anti-corrosive paint, damp proofing finishes.

#### Unit – III

**Glass and glass products:** Composition and fabrication of glass, types of glass, wired glass, fiber glass, rock wool, laminated glass, glass-crete blocks, structural glass, their properties and uses in buildings.

#### Unit – IV

**Plastics:** Polymer types, thermo setting and thermo plastics, resins, common types of moldings, fabrication of plastics, polymerization and condensation, plastic coatings.

Composite materials, classification, properties and uses - linoleum, plastic coated paper, polythene sheets, reinforced plastic, plastic laminates and PVC.

Properties and architectural uses of plastics – structural plastics – Reinforced plastics and Decorative laminates-plastic coatings, Adhesives and sealants – Modifiers and

Primary plastic building products for walls, roof and partitions. Secondary building products for rooms, windows, roof lights, domes, gutters and handrails.

#### Unit – V

**Floorings:** Introduction, essential requirements of a floor, factors affecting selection of flooring material, Various natural as well as artificial flooring materials like brick, flag stone, tiled, cement

concrete, granolithic, terrazzo, marble, shahbad stones timber flooring, timber floor supported on RSJ, flag stone floor resting on RSJ,, vitrified tiles, ceramic tiles, , Mosaic, rubber, Linoleum, and PVC and PVA flooring

### Unit – VI

**Roof Coverings:** Introduction, requirements of good roof, technical terms, classification, types of roof coverings for pitched roof. : Roofing tiles and roofing with cement products like A.C. sheet roofs, G.I. Sheets roofs, slates.

### Unit – VII

**Miscellaneous Materials and treatments:** Properties and uses of Asbestos, cork, felt, mica, adhesive, Bakelite, china clay, fiber glass, leather, canvass, jute, rubber, Asphalt and Bitumen

**Materials for Special Treatments:** Fire resistant, waterproofing, and anti-termite treatment. Damp proofing: Hot applied and cold applied – Emulsified asphalt, Bentonite clay. Butyl rubber, silicones, Vinyls, Epoxy resins and metallic water proofing materials, their properties and uses. Water proofing: waterproofing membranes such as rag, asbestos, glass felt, plastic and synthetic rubber- vinyl, butyl rubber, neoprene, polyvinyl chilnide – prefabricated membranes sheet lead, asphalt their properties and uses.

Application: application of the above in basement floor, swimming pool, and terraces.

Thermal insulation: Heat transfer heat gain/ loss by materials - vapour barriers and rigid insulations, blanket, poured and reflective insulation – properties and uses of spun glass foamed glass, cork, vegetable fibers Gypsum, plaster of Paris, hydride gypsum properties and uses.

Acoustics insulation: porous, baffle and perforated materials such as Acoustic plastic, Acoustic tiles, wood, partition board, fiber board, cook, quilts and mats – their properties and uses – current developments.

Applications: Applications of the above insulations in seminar hall, theater and cold storage.

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#### Reference books:

**Chowdary, K.P.** Engineering Materials are used in India, 7th ed. Oxford and IBH Pub. Ltd., New Delhi, 1990.

**Moxley, R. Mitchell**'s Elementary Building Construction, Technical Press Ltd.

**Rangwala, S.C.** Building Construction: Materials and types of Construction, 3rd ed. John Wiley and Sons, Inc., New York, 1963.

### AR 17B2.5C STRUCTURAL MECHANICS –II

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*L/s: 3/Wk Int: 50 End Exam: 50 Total: 100 End Exam: 3hrs Cr: 3*

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#### Course Overview:

Gives an in-depth understanding of the concepts associated with different Elements of Structures.

#### Objectives of the Course:

To provide knowledge of behavior beams, columns stress behavior due to applied forces.

**Expected Skills / Knowledge Transferred:** Basic principles of mechanics and behavior of elements of structures.

#### Unit-I

Theory of simple bending Introduction, pure bending & ordinary bending, Assumptions derivation of flexure formula section modulus Numericals on flexure equation.

### Unit-II

Shear stresses in beams Introduction, derivation of shear stress formula, shear stress distribution for standard shapes like rectangle circle triangle I, T L, C Section Numericals.

### Unit-III

Direct & bending Stresses Introduction, stress distribution of eccentrically loaded column, middle third rule, core or Kernal of Section, stress distribution for column with one axis eccentricity, two axis eccentricity, Numericals.

### Unit IV

Deflection-I-Introduction of slope & deflection, slopes & deflections for cantilever beams with point load & udl's using double integration method & moment area methods

### Unit V

Deflection-II- Introduction of Macaulay's method, slopes & deflections simply supported beams with point load & udl's double integration & Macaulay's methods

### Unit-VI

Fixed beams Introduction Advantages and disadvantages of fixed beams over simply supported beams, SFD & BMD for fixed beams with combination of point loads & udl's (No formula derivations)

### Unit-VII

Propped Cantilevers Introduction, Reaction of a prop, Cantilevers with Udl's, point loads, prop at end & at intermediate positions, slope & deflection

### Unit-VIII

Welded joints: Introduction, Advantages and disadvantages of welded joints, types, strength of fillet weld, design of welded joint for plates and unsymmetrical sections for axial loading

### Reference Books:

**Khurmi. R.S.** Engineering Mechanics, S. Chand and Co.Ltd., New Delhi, 1999.  
**Ramamrutham. S.** Engineering Mechanics, 7th ed. Dhanpat Rai Pub. Co. Ltd., Delhi, 2004.  
**Timoshenko. S. and Young, D.H.** Engineering Mechanics, McGraw-Hill International Editions

## AR 17B2.6C HISTORY OF ARCHITECTURE - I

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*L/s: 3/Wk    Int: 50    End Exam: 50    Total: 100    End Exam: 3 hrs    Cr: 3*

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### Course Overview:

History of Architecture to be studied as development of building forms in response to social, religious, aesthetic and environmental factors. The study should focus on the three dimensional forms, plan forms, façade organization, structural solution, construction methods and ornamentation. The study should focus on the general trends and not on specific examples of buildings

### Objectives of the Course:

- To expose the students to a wide spectrum of architectural styles ranging from pre-historic to modern times.
- To explain to the students the evolution of architecture in relation to time with special emphasis on social, religious and environmental factors.
- To make the students understand the developments in the construction technology in different periods.

### Expected Skills / Knowledge Transferred:

- 1) Acquire knowledge to identify the common characteristics among the monuments of a particular style.

- 2) Acquire graphic skills to present a building, analyze its elements and explain the composition.
- 3) Acquire knowledge on good practices of architecture in the past.

### Course Contents:

#### Unit – I

Architectural development in the ancient civilizations in Indus valley, Egypt and Mesopotamia, Study of Pyramids, Temples, Mastabas, Ziggurats.

#### Unit – II

Architecture in the Classic Greek periods, different orders, optical correction and appreciation of perfection.

#### Unit – III

Architecture in Roman period; Grand scale, application of Greek orders; Construction of vaults; study of different typologies of buildings; development of roads and aqueducts;

#### Unit – IV

Architecture in the early Christian, Byzantine, Romanesque, Gothic periods in Europe and rest of the world excluding Asia.

#### Unit – V

Architecture in Renaissance and Baroque: revival in architecture, study of building typologies.

#### Unit-VI

The other architecture styles preceding the advent of Industrial revolution in Europe - Mannerist architecture, Jacobean architecture, Elizabethan architecture, Victorian architecture and Moorish architecture.

### Reference books:

- Fletcher, Sir Banister.** A History of Architecture, 19th ed. CBS Pub., Delhi, 1992.  
**Yarwood, Doreen.** A Chronology of Western Architecture. B.T. Batsford Ltd., London, 1987.  
**Schulz, Christian Norberg.** Meaning in Western Architecture, 2nd ed. Rizzoli Intl. Pub., New York, 1981.  
**Copplstone, Trewin and Others.** World Architecture: An Illustrated History, 11th ed. Hamlyn, London, 1979.  
**Bindoo. D.D,** History of Architecture, Milind P Lakshana, Hyderabad – 2006.  
 Wittkaner R Architectural Principles in the Age of Humanism, Chichester :Academy Editions 1998

### AR 17B2.7C SURVEYING AND LEVELING

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*L/s: 3/Wk    Int: 50    End Exam: 50    Total: 100    End Exam: 3hrs    Cr: 3*

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#### Course over view

To explain the different techniques and instruments used in survey of land tracts

#### Objectives of the Course:

To explain the techniques and instruments used in survey of land tracts.

#### Expected Skills / Knowledge Transferred:

Surveying skills and related theory.

#### Course Contents:

##### Unit – I

Introduction – Definitions – Basic Principles of Surveying; Classification of Survey; Uses of Survey - Scales and Symbols- Sources of errors in Survey – Linear Measurement: accurate and approximate methods, duties of Surveyor.

## Unit – II

Chain Surveying – Introduction – Types of chains and tapes. Instruments for chaining and taping – ranging-cross staffs – offsets – obstacles in chain surveying – errors and corrections (standardization, temperature and pull) composition of Areas (Trapezoidal rule – Average ordinate-Simpson rule).

## Unit – III

Compass Surveying: Introduction – Prismatic Compass and Surveyors Compass – Types of Bearings-Designation of bearings – Fore bearing and back bearing – Types of Traverse – Temporary adjustments of prismatic compass, local attraction, Corrections, precautions, errors.

## Unit – IV

Plane Table Survey: Introduction – Types of Plane Tables and their Accessories – Setting up the plane table – traversing – Radiation Method – Intersection Method – Resection Method (two point problem). Three point problem

## Unit – V

Leveling – Introduction –Definitions of terms used in leveling – Principle of leveling – Classifications temporary adjustments of dumpy level, RL's by height of Instrument and rise and fall method, Contouring and their characteristics, uses, – errors in leveling.

## Unit – VI

Theodolite – Introduction – vernier Theodolite – uses of Theodolite - Temporary adjustments – Traversing.

## Unit – VII

Automated Surveying – Introduction to use of Digital Surveying – Instruments such as distomat – total station, Electronic Theodolite, G.P.S.

## Unit – VIII

Site Studies – Plot, site, land and regions, size and shape of site, Analysis of accessibility, Topography, Climate, land forms, Surface Drainage, Soil, Water, Vegetation, Ecology and Visual aspects.

### Reference books:

**Arora, K.R. Surveying Vol. I, 6<sup>th</sup> ed.** Standard Book House, Delhi, 2000.

**Lynch, Kevin.** Site Planning. MIT Press, Massachusetts, 1962.

**Punmia, B.C.** Surveying Vol. 1, 13<sup>th</sup> ed. Laxmi Publications Pvt. Ltd., New Delhi, 1996.

## GN 17B2.1A COMMUNICATION SKILLS

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*L/s: 2/Wk    Int: 50    End Exam: 50    Total: 100    End Exam: 3hrs    Cr: 2*

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**Course Overview:** To prepare students to acquire understanding and fluency in English for professional work

**Objectives of the Course:** To provide an adequate mastery of technical and communicative English Language training primarily, reading and writing skills, and also listening and speaking skills.

**Expected Skills / Knowledge Transferred:** To prepare students for participation in seminars, group discussions, paper presentation and general personal interaction at the professional level.

**Unit I:** Communication: Importance of Communication; Elements of good individual communication; organizing oneself; different types of communication; Barriers in the path of Communication

**Unit II:** Listening skills: Listening to conversation and speeches (Formal and Informal)

Reading: Techniques of reading, skimming, Scanning, SQ3R technique



**Unit III:** Creative Writing: Scope of creative writing; Writing skills  
Signposting, Outlines, Rephrasing  
Writing a report/ format of the report; Paragraph, Letter Writing,  
Essay writing, Memo, Circular, Notice, Cover Letter, Resume,  
Writing with a thesis, Summary, Précis, Product description –  
Description of projects and features  
Oral Report; Periodical Report; Progress Report; Field Report  
Preparation of minutes; Video conference; Tele conference / Virtual  
meeting

**Unit IV:** Speaking: How to converse with people, How to  
communicate effectively; Language and grammar skills;  
Pronunciation drills, Phonetics, vowels, Diphthongs, consonants,  
Stress, Rhythm and intonation, Conversational skills  
Features of effective speech - practice in speaking fluently –role  
play – telephone skills – etiquette.  
Short Extempore speeches – facing audience – paper presentation  
– getting over nervousness – Interview techniques – preparing for  
interviews – Mock Interview – Body Language.

**Unit V:** Impact of internet on communication; communication  
through computers; voice mail; broadcast messages; e-mail auto  
response; etc.

**Reference books:**

1. **Krishna Mohan & Meera Banerji:** Developing Communication Skills  
Macmillan India
2. **C S Rayudu:** Principles of Public Relations, Himalaya Publishing  
House
3. **K. Ashwathappa:** Organizational Behavior, Himalaya Publishing  
House
4. **Daniel Colman:** Emotional Intelligence,