



FIRST SEMESTER AR17B1.1C

BASIC DESIGN

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

Course Overview:

Basic Design provides the framework for understanding design by sensitizing students to the conceptual, visual and perceptual issues involved in the design process, through exercises in simple two dimensional and three dimensional compositions.

Objectives of the Course:

- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises to develop expression and creative thinking.
- Introduction to design - problem-solving, elements of design, principles of design, 2-D designs in different mediums, colours and textures for articulation of abstract ideas.
- Learning in the subject to be strengthened by conducting at least two workshops (preferably conducted by fine arts faculty), one of which should focus on visual art.

Expected Skills / Knowledge Transferred:

The Course prepares ground for the students to gain an understanding into the fundamental issues in design and develop the skill to create solutions for simple elements of building.

Course Contents:

Unit – I

Introduction to design – importance of design; Study and appreciation of design examples from forms in nature and analysis with respect to their colour, form, texture and structure. Exercises involving these natural forms and various



approaches to art such as – Representation, Abstraction, and Non-Representational/ Non-Objective compositions.

Analysis of Simple Objects: Critical analysis of simple man-made objects and environments to understand the underlying concepts in their design. Studies to understand function - Aesthetic Relationship, and Anthropometrics.

Unit – II

Elements of design: point, line, shape, form, space, texture, value, colour and material; Introduction to the principles of composition: unity, balance, symmetry, asymmetry, proportion, scale and proportion, hierarchy, rhythm, contrast, harmony, focus, movement, direction, gradation, repetition, etc; Application of the principles of composition in two dimensional compositions;

Unit - III

Compositions in two dimensions: shapes and patterns; use of grids in creating repetitive patterns; Principles of composition- using grids, symmetrical /asymmetrical, rule of thirds, center of interest etc.

Form generation through addition & subtraction, Anomaly, Positive & Negative spaces, Solid and Voids.

Developing compositions in two dimensional designs like- logos, cover page, collage, mural, floor patterns, grills, railings, gates etc.

Unit - IV

Concepts of geometry –different three dimensional forms, primitive forms and understanding the behavior when combined- Transformations to three dimensional forms; Explorative exercises in three dimensional compositions.

Making three dimensional sculptures involving the basic platonic solids and abstract sculptures using various techniques/ materials. (Ex: POP, wire/ matchstick, soap, clay etc.)



Unit - V

Colour theory, color wheel, primary, secondary, tertiary colors, color schemes, color value and intensity, colour coding systems and psychological factors governing the choice of colour schemes in architecture. Theoretical inputs to be followed by exercises to develop the ability to translate abstract principles into two and three dimensional compositions.

UNIT VI

Design of non-enclosed object. eg. park seat, push-cart, built-in furniture etc. Developing compositions in of semi-enclosed spaces- entrances, gateways, portal, compound walls etc.

Unit - VII

Study of ornament in architectural design: documentation and comparison of different types of ornamentation in historical and contemporary buildings, to understand their design features as studied in the previous units.

Reference books:

- Wucius, Wong. Principles of two Dimensional Design. Van Nostrand Reinhold 1972. Maier Manfred Basic Principles of Design, Vol.1, 2, 3 & 4, Van Nostrand Reinhold, NY. (1977)
- Ching, Francis D.K. Architecture: Form, Space, and Order, 2nd ed. Van Nostrand Reinhold, New York, 1996.
- Hanks, A. David. Decorative Designs of Frank Lloyd Wright, Dover Publications, Inc. New York, 1999.
- Hepler, E. Donald, Wallach, I. Paul. Architecture Drafting and Design, 3rd ed. McGraw-Hill Book Company, New York, 1977.
- Itten, Johannes. Design and Form: The basic course at the Bauhaus, Thames and Hudson Ltd., London 1997.
- Krier, Rob. Architectural Composition, Academy Editions, London, 1988.
- Meiss, Pierre Von. Elements of Architecture: From form to place, E and FN Spon, London, 1992.
- Pipes, Alan. Drawing for 3-Dimensional Design. Thames and Hudson Ltd., London 1990.
- Shibikawa, Ikuyoshi and Takahashi, Yumi. Designers Guide to Colour.
- Smithies, K.W. Principles of Design in Architecture. Chapman and Hall, 1983.



AR17B1.2C ARCHITECTURAL DRAWING AND GRAPHICS – I

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

Course Overview:

The course introduces the fundamental techniques of architectural drawing and develops the appropriate skills for visualization and representation.

Objectives of the Course:

To introduce architectural drawing techniques and to facilitate effective visual communication.

Expected Skills / Knowledge Transferred: Freehand, scale drawing, conventional architectural representations in drawings and graphics.

Course Contents:

Unit – I

Introduction: Fundamentals of drawing and its practice, introduction to drawing equipment, familiarization, use and handling. Drawing sheet sizes, layouts and composition. Simple exercises in drafting, line types, line weights; dimensioning, use of scale

Unit – II

Typography –anatomy of Type, Styles, Roman and Gothic style lettering; freehand lettering, title panels and legends.

Unit – III

Geometrical Construction: Constructing simple and complex geometrical shapes involving various drafting techniques; regular shapes using T-squares, set-squares; straight lines, triangles, quadrilaterals, circles, tangents, regular polygons, polygons inscribed in circle.

Description of Plane Curve: Ellipse, Parabola, Hyperbola and Ovals.



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Unit – IV

Architectural Symbols: Representation of building elements, openings, materials, furniture and accessories; human postures; vegetation; vehicles; terminology and abbreviations used in architectural representation.

Unit – V

Measuring and Drawing to Scale: Scales and construction of scales, scaled drawings of simple objects, dimensions; scaled drawings of furniture, rooms, doors and windows etc., in plan, elevation and section. Reduction and enlargement of drawings.

Unit – VI

Free Hand Drawings: Line strokes, light and shade techniques of simple, natural and 3D geometric forms. Study of proportions and scale; structure and axes of objects; Indoor and Outdoor sketching of built and natural forms: Still life, furniture, etc.

Note: This is a studio subject and students should be made to prepare drawings as studio exercises along with the theoretical inputs. The studio work should be supplemented with appropriate site visits.

Reference books:

Moris, I.H. Geometrical Drawing for Art Students.

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.

Bies, D. John. Architectural Drafting: Structure and Environment. Bobbs – Merrill Educational Pub., Indianapolis.

Nelson, A. John. H.B. of Architectural and Civil Drafting, Van Nostrand Reinhold, New York, 1983.



AR17B1.3C BUILDING CONSTRUCTION- I

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

Course Overview:

The course introduces to the methods and techniques of construction of basic elements of a simple building.

Objectives of the Course:

To understand the elementary and simple construction methods, explaining basic principles and considerations in the construction of one roomed rectilinear building with verandah.

Expected Skills / Knowledge Transferred:

To understand the techniques of construction of a simple load bearing structure with simple material like brick, stone etc.

Course Contents:

Unit I

Basic building components: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs parapet & weathering course

Walls: Details of walls section across the opening (door & window) Roofs: simple configurations and details of various forms of roofs (flat, slope pyramidal & dome)

Unit – II

Brickwork: Various types of bonds, stopped ends, junctions, piers, jambs, footings, foundations, corbelling, damp proof course, window sills, thresholds, copings, mortar joints and pointing.

Unit – III

Stone masonry: stone walls, rubble work, ashlar work, masonry joints, window sills, plinth, cornices, surface finishes.



Unit – IV

Composite masonry: Brick backed ashlar, rubble backed ashlar, concrete backed masonry, ashlar faced concrete walls, marble faced masonry; tile faced concrete, hollow block masonry.

Cladding: Cladding of various materials-marble, granite, slate, tiles, metal etc.

Unit – V

Lintels: Lintels of wood, stone, brick.

Arches: arches; terms defined; various forms of arches like segmental, semi-circular, elliptical, three-centered, flat and relieving arch, etc.

Unit – VI

Building Foundations: Definition, safe bearing capacity of soils; brick and stone foundations, simple, steeped, combined and cantilevered footing, RCC footing.

Basement: Damp proofing, different types of damp proof materials, their compositions and application, Constructional details of walls, floors, foundations etc. with respect to their damp proofing and natural ventilation.

Unit – VII

Construction techniques of the past: Ground and upper floors: solid floor, brick flooring, floor finishing and floor coverings, Basement floor.

Wooden ground and upper floors: Terms defined, bridging joists, binding joists, binders, beams and girders, solid and herring bone strutting, floor boards, ceiling joists, trimming floors to accommodate fire place. Details of fire place. Flat roofs: Madras terrace, Jack arch, elementary knowledge about R.C.C roof and floor slabs.

This unit to be taught with the objective of giving a historical perspective. A broad orientation may be given without preparation of drawing plates.

To give the learning in this subject a more practical orientation seminars by industry or trade related organizations or field/site visits should be organized. At least two exercises to be done in the construction yard. A weight age of 5% in the overall Internal Assessment in the subject should be reserved for students



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attending these seminars/site visits and maintaining the records/observations as required by the subject faculty.



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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.



AR17B1.4C BUILDING MATERIALS – I

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

Course Overview:

The course provides information on the properties, use, installation and costs of basic building materials.

Objectives of the Course:

To impart knowledge on the various building materials,

To highlight the current trends and innovations in the usage of building materials.

Expected Skills / Knowledge Transferred:

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

Course Contents:

Unit –I

Brick as a building material: Types, properties, uses and manufacturing methods. Brick: Composition of earths, standard, market and ISI. size properties, as per ISI brick manufacturing processes, requirements and tests for good bricks. Fire clay bricks - varieties; sand lime bricks;

paving bricks; Terra-cotta-its varieties: ordinary, glazed, porous, polished and fine; sun dried brick, Special types of bricks, uses and properties Different uses of brick in construction.

Building Tiles: Roof, floor and wall tiles.

Unit –II

Stones: Classification of stones: granite, laterite, quartzite, marble and slates -properties and uses; stone units - khandki, rubble, black stones, stone metal, flag stones. method of quarrying of building stones, types of stone dressings defects in stone, stones used in



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construction, uses in construction, aggregates. tool used, Preservation of stone work.

Unit –III

Sand : Pit, river sea sand, gravel, bulk age of sand, impurities in sand their removal, tests for silt and organic contents different grades of sand with respective to size and their application. I.S.I. standards, use in mortar and concrete.

Unit –VI

Cement: Ingredients and properties of cement, Types of cement, Grades of cement, Initial and final setting time, Test of cements, ISI Standards, Pozzolana material and its properties.

Unit –V

Mortars: Types, proportioning, mixing and grinding, mortar, cement mortar, lime mortar, methods of preparing, handling and uses of mortars, Surkhi-mortar, light weight mortars i.e. cinder, sawdust and fibrous plaster, gypsum plaster, Plaster of Paris and application.

Concrete: Concrete and its constituents, aggregate: coarse and fine, properties of concrete, strength, durability, etc. Effect of age on strength.

Grading: importance, fineness modulus, combined aggregate, water cement ratio. Mixing and Curing.

Unit –VI

Timber: Building timber types and its properties, sawing of timber, shrinkage and distortion, wastage, methods of sawing. Drying and seasoning, moisture contents, purpose of seasoning, natural and artificial. Defects in timber. Use and application of timber in construction.

Processed woods: Plywood and Synthetic boards properties and application. Use of alternative materials as substitute to wood. ISI standards

Unit –VII



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Ferrous Metals - Pig iron, cast iron, wrought iron, steel, manufacturing processes and casting. Characteristics form and uses of cast iron, wrought iron and steel.

Alloys steel, stainless steel, steel-treatment, steel tempering, annealing, normalizing, and case hardening, their objectives and effect on alloy steels. Galvanizing, oxidation and casting of metallic products, corrosion of iron and their prevention. Metallic protective coatings.

Non ferrous Metals: Basic idea of important ores, properties and uses of Aluminum, Zinc, Copper, Tin and Lead

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.

Students should be exposed to Lab tests in the context of the listed materials.

Reference Books:

Hailey & Hancock, D.W. Brick Work & 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.



AR17B1.5C STRUCTURAL MECHANICS – I

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

Course Overview:

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

Objectives of the Course:

To provide knowledge of different forces, force systems, Beams types sectional Properties behavior of different members due to applied forces.

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

Course Contents:

Unit – I

Introduction: Forces, system of forces, resultant, equilibrant Parallelogram law, Triangle law, Lamis Theorem, polygon law, resultant of coplanar, concurrent force system, couple, characteristics of couple, moment, Equilibrium, Varignon's Theorem.

Unit – II

Analysis of trusses, types of stresses, Loads on trusses, 2-D truss analysis using method of joint (Cantilever & Simply Supported)

Unit – III

Stress, Strain, type of stresses, stress-strain curve for ductile Material, Hooke's law, Modulus of Elasticity, Bars of Varying Section, Bars of Composite Section.

Unit – IV

Shear stress, types of Strain, poissons Ratio, Shear modulus Bulk Modulus Relation between the three Elastic Constants members subjected to 3 mutually perpendicular forces

Unit – V



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Types of Beams, types of loads, calculation of reactions for simply supported beam (Using Point loads & Udl's) definition shear force & Bending Moment SFD& BMD for Cantilever beams.

Unit – VI

Shear force & Bending Moment diagrams for simply supported & over hanging beams for point loads & UDL, point contra flexure & its location, Relation between loading, SF & BM

Unit – VII

Definition of centroid, line of symmetry ,centroid for some standard shapes, calculation of centroid for shapes like L,T,C,I Sections etc., moment of inertia, Derivation of M.I formula for Rectangle, circle, Triangle, calculation of M .I for L,T,C,I Sections etc.,

Unit VIII

Types of joints, lap joint & butt joint, failure of riveted joints, strength of the joint, efficiency of joint, Unwins formula, chain riveting & Diamond Riveting

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.



AR17B1.6C INTRODUCTION TO ART AND ARCHITECTURE

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

Course Overview:

Introduces fundamental ideas, methodologies and terminologies in art and architecture, shedding light on why certain works were produced, what meanings they communicated, and how they are important to our contemporary society. Emphasis will be placed on styles and the unique historic contexts and circumstances that shaped them.

Objectives of the Course:

To analyze various art forms, and understand the techniques involved in creative thinking.

Expected Skills / Knowledge Transferred: Understanding various art forms, appreciate art and architecture.

Course Contents:

Unit – I

Purpose and relevance of art, Art consciousness: Aesthetics, perception, symbolism, expression, style, fashion, appropriateness and values. Understanding works of art.

Its role meaning and purpose in terms of basic characteristics and development as an expression of culture

Unit – II

Development of art; A survey of history of art forms; pre-historic period to the present times; Changing nature of art through time in terms of content; form and material

Unit – III

Exploration of art forms - Role and meaning of art-various types of arts - fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art etc.



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Nature and characteristics of art forms such as Painting, Sculpture, Architecture, Photography, Almost Art; Nature and characteristics of
of



art forms such as Dance, Drama, Music, The Film,
Literature Relationship between art and architecture from
earliest times.

Unit – IV

Definitions and general understanding of architecture, role of architect in a building project. The changing role of architects, his relation with other consultants, contractors and client, technical knowledge and other skills required as inputs. Various subjects to be learnt by architecture students, their relevance to practice.

Unit – V

Various factors influencing the architecture of a region, architecture as a response to social, technological and environment forces. Evolution of shelter forms in regions of the world and examples of vernacular architecture in the world, with particular reference to India.

Reference Books:

- Craven, C. Roy. Indian Art a Concise History.
Kumar, Raj (Ed.). Essays on Indian Art and Architecture. Discovery Pub., New Delhi, 2003.
Fisher, E. Robert. Buddhist Art and Architecture. Thames and Hudson, London, 1993.
Ghosh, A (Ed.). Jain Art and Architecture Vol. 1-3. Bharatiya Jnanpith, New Delhi.
James C. Snyder, Introduction to Architecture, New York: Mc Graw Hill.
Christopher Alexander, Pattern Language, New York: Oxford University Press
Thomas Mitchell, Redefining Designing: From to Experience,
James snyder and Anthony Y catanse, Introduction to Architecture, Mc Graw-Hill Book company, New York, 1979.
Rapoport, Amos, House form & Culture.



AR17B1.7C WORKSHOP- CARPENTRY & MODEL MAKING

L/s: 4/Wk Int: 50 End Exam: Nil Total: 50 End Exam: Nil Cr: 4

Course Overview:

The course provides the foundation and capability to represent the concepts three dimensionally.

Objectives of the Course:

To introduce various fabrication skills and techniques necessary to produce scale-models and to encourage preparation of models as an essential phase in design development and evaluation.

Expected Skills / Knowledge Transferred: Dexterity; Knowledge of materials and their properties; craft skills; visualization skills;

Course Contents:

Unit – I

Introduction to model-making: Need; role of scale-models in design; general practices; Digital models.

Unit – II

Essentials of model-making: understanding of various tools and machines employed, best practices involved in operating the tools and the techniques.

Unit – III

Survey of various materials available for model making such as papers, mount boards, wood, plastics, films, plaster of paris, acrylic, Styrofoam, wax, metals, glass, FRP, etc. and exploring their potential in model-making. Chamfering at 45 degrees in mountboard.

Unit – IV

Techniques of Scale-modeling: Use of different scales; templates; measuring aids; conventions followed.



Unit – V

Techniques for preparation of presentation models, mock-ups, simulation of various materials and textures such as wood, glass, aluminum, steel, bricks, roofing tiles, flooring, corrugated sheets, upholsteries etc.

Unit – VI

Carpentry: Introduction to the use of different types of tools and different types of joints used in carpentry. Joinery details which are commonly used in timber construction. Application of surface finishes such as polish, varnish, lacquer on wood.

Unit—VII

Photography in built models, using lighting and natural background.

Assignments.

At least three major assignments involving the individual students to fabricate

- a. Scale model of a piece of furniture
- b. Presentation of models
- c. mock-up of an everyday object
- d. Three-dimensional forms etc.

Documentation of the important phases of fabrication is must which shall become the basis for internal evaluation.

Reference books:

Bernald, S and Copplene, Myers. History of Art.

Craven, C. Roy. Indian Art a Concise History.

Krier, Rob. Element of Architecture. Academy Editions, London, 1992.

Lang, Jon. A Concise History of Modern Architecture in India. Permanent Black, Delhi, 2002.

Magnet, Jacques. The Aesthetic Experiences: An anthropologist looks at the Visual Art.

Preble, Duame. Art Forms.

Snyder, C. James and Catanese, J. Anthony. Introduction to Architecture. Tapert, Annette. Swid Powell: Objects by Architects.

Rizzoli, New York, 1990. Thyagarajan. Basic practical photography

Ching Francis D.K: Architecture: Form, Space, and Order.



GN 17B1.2A COMMUNICATION SKILLS

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

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



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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,



SECOND SEMESTER

AR 17B2.1C ARCHITECTURAL DESIGN – I

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

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, 2nd 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.



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Shah, S. Charanjit. Architects Hand Book Ready Reckoner.

Galogotia Pub. Co., New Delhi, 1996.

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

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

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 Covezza, 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,



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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



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

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.

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

- 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.



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AR 17B2.4C BUILDING MATERIALS – II

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

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, chlnide –
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.

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:

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

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

Course Overview:

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

Objectives of the Course:



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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:



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

KAKINADA – 533 003, Andhra Pradesh, India

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



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

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.



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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

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

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



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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, 6th ed. Standard Book House, Delhi, 2000.
Lynch, Kevin. Site Planning. MIT Press, Massachusetts, 1962.
Punmia, B.C. Surveying Vol. 1, 13th ed. Laxmi Publications Pvt. Ltd., New Delhi, 1996.



GN17B2.1A ENVIRONMENTAL STUDIES

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

Course Overview:

A compulsory subject for all the undergraduate students of various discipline highlights significance of maintaining balance and sustainability of various components of the environment.

Objectives of the Course:

To sensitize the students towards sustainable environment.

Course Contents:

Unit – I

Environmental studies – Introduction: - Definition, scope and importance, Measuring and defining environmental development indicators.

Unit - II

Environmental and Natural Resources: Renewable and non-renewable resources - Natural resources and associated problems - Forest resources - Use and over - exploitation, deforestation, case studies - Timber extraction - Mining, dams and other effects on forest and tribal people - Water resources - Use and over utilization of surface and ground water - Floods, drought, conflicts over water, dams - benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer- pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.



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Unit - III

Basic Principles of Ecosystems Functioning: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit - IV

Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values *Biodiversity* at global, National and local levels. - India as a mega-diversity nation - Hotspots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit - V

Environmental Pollution: Definition, Cause, effects and control measures of:

- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

Unit - VI

Social Issues and the Environment: From unsustainable to sustainable development -Urban problems related to energy -Water conservation,



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rain water harvesting, watershed management
-Resettlement and rehabilitation of people; its problems and concerns. Case Studies - Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. -Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

Unit - VII

Human Population and the Environment: Population growth, variation among nations. Population explosion - Family Welfare Programme. - Environment and human health. -Human Rights. -Value Education. - HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

Unit - VIII

Field work: Visit to a local area to document environmental assets River /forest grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. -Study of simple ecosystems pond, river, hill slopes, etc.

TEXT BOOK:

Erach Bharucha, A Text Book of Environmental Studies for Undergraduate Courses, University Grants Commission.