

++  
**DEPARTMENT OF ARCHITECTURE, COLLEGE OF  
ENGINEERING,  
ANDHRA UNIVERSITY.**

**DETAILED SYLLABUS**

(Effective for the students studying 1st year from the  
Academic year 2006-2007 and onwards)

**FIRST YEAR**

**06.1.1.1: INTRODUCTION TO ARCHITECTURE &  
BASIC DESIGN.**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		12	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

**Course Overview:**

Basic Design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process.

The Course provides with knowledge of the principles of design and design elements. Exercises complement the lectures and ensure that the students learn to develop a series of compositions in two and three dimension.

The Course also prepares ground for the students to gain an understanding into the fundamental issues in architectural design and develop the skill to create architectural solutions for simple problems.

**Course Content:**

- Introduction to design: Meaning of design, importance of design.
- Fundamental elements of design and their definitions-point, line, shape, form, space, texture, value and colour.
- Introduction to the principles, of design-unity, balance, symmetry proportion, scale, hierarchy, rhythm, contrast, harmony, focus etc. use of grids, creating repetitive patterns.

*Revised Academic Regulations,  
Course Structure and  
Syllabus 2006-2007*

Colour theory, color wheel, primary, secondary, tertiary colors, color schemes, color value & intensity. Theoretical inputs to be followed by exercises to develop the ability to translate abstract principles into compositions in 2D & 3D.

Study of ornament in architectural design. Different types of ornamentation in buildings. Study of historic examples.

Basic anthropometrics-average measurements of human body in different postures-its proportion and graphic representation, application in the design of simple household and street furniture.

- Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions. User data-Bubble and circulation diagrams.
- Detailed study of spaces such as living, dining, bedrooms, kitchen, toilet, etc. including the furniture layout, circulation, clearances, lighting and ventilation, etc.

**References:**

1. Francis, D.K.Ching – Form Space & Order
2. Wong Wucius – Principles of two dimensional design
3. Von Mesis – Elements of architecture
4. Robkrier – Architectural Composition
5. Johannes Itten – Design & Form
6. Donald E. Helper, Paul I. Wallach – Architecture Drafting & Design
7. David A.Hanks: The Decorative Design of Frank Lloyd Wright.
8. K.W.Smithies Principles of Design in Architecture.
9. Alan pipes – Drawing for 3 – dimensional design.
10. Ikuyoshi Shibikawa and Yumi Takahashi – Designer s Guide to Colour.

**06.1.1.2: ARCHITECTURAL DRAWING & GRAPHICS –I**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		Internals	50	
Studio	3	Externals	50		
Total	5	Total	100		

**Course Overview:**

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

**Course Content:**

Scale and measured drawing: introduction to drawing instruments their use and handing, simple exercises in drafting, dimensioning of lines and place figures. Architectural presentation of materials on drawings, terminology and abbreviations used in architectural presentation. Use of scale in drawings. Scaling and measuring of simple objects and representing them in plan, elevations and sections.

Measuring and drawing to scale the following: furniture pieces, rooms, doors and windows, etc., reduction and enlarging of drawings, tracing in pencil, ink from simple drawings, use of tracing cloth. Lettering for titles and annotation of drawings.

Freehand drawing: explanation of fundamentals of drawings and its practice. Object drawing (two exercises in the drawings), studies in light and shade of simple, natural and geometric forms (two exercises). Outdoor sketching of simple building forms (two exercises).

Architectural representation of the following on drawings: trees, hedges, foliage, human figures in different postures, cars, etc.

Solid geometry: study of points, lines, planes leading to simple solid geometrical forms in different positions (first angle projections).

Building geometry: study of isometric, axonometric and oblique views, use of circle in buildings – Ovule Covetta, Ogee, Lancet, Horseshoe, Moorish, Stilted, Rampant, Tudor, Three centered and Drop. Ionic volute (by Gibbs Rule), Entasis of column (by conchoid of Nicomedes Method). Reduction and enlarging of large forms such as site plans, etc.

- **Sciography:** Practical examples in the study of shade and shadows, points, lines, surfaces, geometrical solids of various forms and groups of forms leading to advanced examples of shades and shadows on buildings or parts of buildings.
- **Perspective:** advance examples in one point or parallel perspective, two point or angular perspective, introduction to three-point perspective.

**Rendering:** introduction to the rules of composition and perspective in architectural rendering, color study, values, tones and general approach to rendering. Various colour schemes, water colour and poster colour rendering, pencil rendering and monochrome and wash rendering etc. treatment of sky, clouds, landscape elements, human figures, foreground and surroundings, shadow projections in renderings

**References:**

1. N.D.Bhat, V.M.Panchal “Engineering Drawing” – Plane and Solid Geometry.
- 2.Moris.I.H. “Geometrical drawing for Art students”.
- 3.Nelson J.A. – Hand book of Architectural & Civil Drafting.
- 4.P.S.gill – A text book of Geometrical Drawing.
- 5.John D.Bies – Architectural Drafting: Structure & Environment.
- 6.Thoms. E. French – graphic Science & Design.
- 7.T.B.Nichols and Normal keep – Geometry of Construction.
- 8.Shah: Building Drawing.
- 9.Drawing architecture – Paul Hagarth
- 10.Drawings by architects – Claudius Conli
- 11.Perspective – H. Pranchlay
- 12.Pencil techniques in modern design – Alkin, Urbelleth and Lione
- 13.Perspective – space and design – Lance Bowen Bellings

**06.1.1.3: BUILDING MATERIALS – I**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

**Course over view:** This course looks at the different materials that are available naturally, their properties, functions, grading and protective measures to be taken.

Classification of stones: granite, laterite, quartzite, marble and slates –properties and uses; stones, paving sets.

Preservation of stonework, quarrying of building stones, quarry dressing tool used.

Clay bricks: constituents, harmful constituents, and selection of clay, requirements and tests. Fire clay bricks – varieties; sand lime bricks; paving bricks; Terra-cotta-its varieties; ordinary, glazed, porous, polished and fine-uses and properties. Building Tiles: Roofing Tiles, flooring and wall tiles.

Sand: sources, classification, functions, properties, tests for silt and organic contents, size of sand and grading.

Mortars: Types, proportioning, mixing and grinding, mortar mills.

Surkhi mortar, cement mortar, methods of preparing, handling and uses of mortars, light weight mortars i.e. cinder, sawdust and fibrous plasters, gypsum, plaster, composition and uses, Plaster of Paris.

Portland Cement: Raw materials, functions of cement ingredients, Setting action of cement, tests for strength and setting time.

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; curing.

Timber Advantages of timber construction, exogenous and endogenous trees, hard wood and and soft wood, growth of tree and its structure: wood and heart, felling of trees, conversion of felled logs, storage, sawing of timber, shrinkage and distortion, wastage, method of sawing. Drying and seasoning, moisture contents, purpose of seasoning, natural artificial.

Defects in timber: Natural defects, seasoning defects and defects due to fungal action. Causes of decay, factors affecting decay, preservation of timber by applying preservatives like tar, oil, water soluble and organic solvents.

**References:**

1. Brickwork and Associated studies – Hailey and D.W. Hancock
2. Engineering materials as used in India – K.P.Chowdary
3. Hanold.J Rosen Architectural Materials for Construction.

**06.1.1.4: BUILDING CONSTRUCTION-I**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		6	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

Elementary construction methods explaining basic principles of Load bearing and Framed structures.

Walls –stone (in walling, rubble work, joints, plinths, lintels) clay bricks (brick work –English and Flemish brick bonds, stopped ends, quoins, piers, jambs, mortar joints).

- **Composite Masonry:** Brick lacked ashlar, rubble backed ashlar, concrete backed masonry, ashlar faced concrete walls, tile faced concrete, hollow block masonry, and marble faced masonry.
- **Partition walls:** Brick partition, reinforced brick nogged partition, lath and plaster partition, precast concrete partition, glass block and glass Crete partition, and common wooden partition.

Lintels and Arches: lintels of wood, stone, brick; arches: terms defined, forms of arches, i.e. segmental, semi – circular, elliptical, three centered, flat and relieving arch, etc. rough and gauged arch.

Openings – wooden doors and windows (ledged and braced) with simplest and basic hardware.

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

Windows: Ordinary casement, top and bottom hung, pivoted and sliding sash. Hardware: fixtures, locks, hinges, fastenings, etc.

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.

The class and assignment work should include appropriate site visits by the students, and students will have to maintain field observation/record books. Three to four exercises to be done in the construction yard.

**References:**

1. **Elementary Building Construction – Mc. Kay**
- li. **Elementary Building Construction - Mitchell**
- 2 **Building Construction – Rangwala.S.C.**
- 3 **The Construction of Buildings – Barry**
- 4 **A text book of Building Construction – Sushil Kumar**

**06.1.1.5: HISTORY OF CULTURE AND ARCHITECTURE**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		3	Internals	
Studio	0	Externals		50	
Total	3	Total		100	

Part A

**Course overview:**

The Course is intended to provide brief background knowledge of Culture and Art in different parts of the world.

Course Content:

Evolution of mankind-its impact – on primitive arts and crafts in various countries and in India in particular.

Evolution of shelter forms in different regions (deserts, thick forests, mountains, delta etc.)

Growth of Human settlements and cultural influences with emphasis on India.

Influence of religion and culture on domestic and civil architecture with special reference to India, Egypt, Europe.

Industrialization and its impact on Art and Architecture.

Present day trends in Visual arts and Architecture.

**Reference: Story of Architecture.**

Part B

**Course overview:**

History of architecture to be studied as history of development of building forms (3D) ornamentation, structural solutions, construction methods, plans and building façade, organization in relation to aesthetic / religious/social philosophy and environmental factors.

The study should focus on the general trends and not on specific examples/ buildings.

**Course content:**

- Architectural development in the ancient civilizations in Egypt and Mesopotamia, study of pyramids, temples, mastabas, ziggurats, etc.

- Architecture in the classic Greek and roman periods, temples, agoras gateways, circuses, amphitheatres, basilicas, etc.
- Architecture in the early Christian, Romanesque gothic, Byzantine, periods in Europe and rest of the world excluding Asia.

Internal evaluation will be through tests and/ or a seminar to be presented by each student using maps, plans, section/ elevations/ views and other diagrammatic and graphic means.

**References:**

1. A history of architecture – Sir Banister Fletcher
  2. Introduction to architecture – Stephen Gardner.
  3. A chronology of western architecture – Doreen Yarwood
  4. The great ages of architecture – Bodo Lichy
  5. Meaning in western architecture – Christian Noberg Schulz
- World architecture – an illustrated history – Trewin Copplstone and others

**06.1.1.6: ENGINEERING MECHANICS**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	50	
Studio	0	Externals	50		
Total	4	Total	100		

- Introduction: forces, composition, resolution, moments and couples; transformation of couple; resolution of force into force and couple.
- Concurrent and non-concurrent co-planar force systems, resultant and equilibrate analytical and graphical solutions.
- Equilibrium of bodies acted upon by concurrent and non-concurrent co-planar force systems, forces and members of trusses by method of joints and method of sections.
- Simple stresses and strains, elasticity, stress, strain, types of stresses, elastic limit, modulus of elasticity, composite sections. Stresses due to change in temperature.
- Elastic constants, linear strain, lateral strain, Poisson’s ratio, volumetric strain, relation between E, N, and K.
- Beams: bending moment and shear forces; simply supported, cantilever and overhanging beams for various loads, relation between bending moment and shear force.

- Moment of inertia and section modulus for various structural shapes. Theory of simple bending;  $M/I=f/y=E/R$  application of flexural formula.
- Shearing stresses in beams-distribution of shear stress over different sections.
- Deflection of beams: cantilevered and simply supported with different loading, relation between slope, deflection and curvature, double integration method, moment area methods.

**References:**

- a. Engineering Mechanics\_Ferdinand L.Sing
- b. Applied Mechanics\_S.Ramamrutham.
- c. Engineering Mechanics\_Timoshenko & Young
- d. Structural Mechanics\_Junnarkar
- e. Engineering Mechanics\_K.L.Kumar

**06.1.1.7: ENGLISH**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		Internals	50	
Studio	0	Externals	50		
Total	3	Total	100		

**1. Vocabulary:**

- One word substitutes
- Words often confused
- Synonyms and Antonyms
- Foreign Phrases
- Phrasal verbs derived from the Dynamic verbs: Go, Put, Take, Look, Get, Hold, Give Run and Turn.
- Idioms and Phrases

**2. Grammar:**

- Tenses and Uses of Tenses
- Verb
- Spotting the errors in a sentence
- Correction of errors in a given sentence – errors in the use of words – errors in constructing sentence – errors of Indianisms – use of slang – errors in punctuation.
- Concord

- Articles, Proposition and words followed by prepositions.

**3. Reading:**

- Comprehension: Locating the topic sentence – main idea – subordinate idea, pick out definitions, factual information references and inferences.

**4. Writing:**

- Précis writing, Note – making and note taking, letter writing, technical report writing, resume writing, business correspondence, preparation of CV and project reports.

**5. Text:**

- An anthology of prose selections reflecting the Indian culture and the contemporary social problems and models of English prose by VK Maheswari and Sri. B. Srivastava

**References:**

- English for Engineering Students – Prof. GVLN Sarma
- Exam Your English – Margaret M Maison
- Handbook of English Grammar and Usage – Mark Lestov & Larry Beason, TATA Mc Graw Hill edition

**06.1.1.8(a):  
WORKSHOP PRACTICE**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		Internals	50	
Studio	3	Externals	50		
Total	5	Total	100		
		3			

**Course content:**

Model making: Preparation of wooden base for model Making of three dimensional building blocks & forms using different types of materials such as paper, rubber, acrylic, polystyrene, FRP, etc. Three to four exercises to be done.

**References:**

- Designing with models – Criss. B. Mills.

**06.1.1.8(b): SURVEYING & SITE STUDIES**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		Internals	50	
Studio	3	Externals	50		
Total	5	Total	100		
		3			

**• Surveying:**

- Basic principles and chain surveying: Definitions, scales and symbols, sources of error in surveying and theory of probability, measurement of distance, instruments used, ranging of survey lines, chaining a line with examples, chaining on sloping ground, errors in chaining, tape corrections, chain surveying principles, off-sets, field notes, instruments, obstacles in chaining, plotting chain survey with practical examples.
- Traversing and plain table surveying: Tape and chain traversing, instruments used, methods of traversing, bearing lines, local attraction, plotting, magnetic declination, precautions in using compass, traversing by theodolite, instruments used and methods, plain table surveying methods, two point and three point problems, exercise in preparation of base map of small areas.
- Computation of areas and leveling: Computation of areas, from field notes and from plan with examples, leveling: instruments used, definitions principles, reduction of levels classification of leveling, errors in leveling contouring; characteristics of contour lines, interpolation and interpretation of contours, uses of contour lines.
- automated surveying: introduction to the use of digital surveying technologies such as total station, G.P.S through demonstrations.

**• Site studies:**

Plot, site, land and regions, size, shape of sites. Analysis of accessibility, topography, climate, landforms, surface drainage, soil, water, vegetation, ecology and visual aspects.

Note: Field book to be submitted at the end of the semester.

**Viva Voce:** Student should field book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner.

**References:**

- Surveying vol-I – B.C.Punmia
- Planning design criteria- joseph de chiara & lee copleman
- Site planning – Kevin Lynch

## SECOND YEAR, 1<sup>st</sup> Semester

### 06.2.3.1

#### ARCHITECTURAL DESIGN-I

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

**Course overview:** Lectures on theory of Architecture and principles of planning. Elements of composition, analytical classification of spaces for different uses and their relation to one another. Study of horizontal and vertical circulation in buildings. Detailed study of analysis of sites and surroundings.

**Course content:** The design issues to be addressed include,

- Integration of Form and Space
- Visual analysis of Built form
- Principles of Perception – Proximity, Similarity, Closure (Gestalt type).

The list of suggested topics to be covered as design problems including preparation of measured drawings and design elements are,

- Bus shelter, Milk booth, Security cabin, ATM center, Internet center, Gateway etc.
- Primary health center, village post office, a school gymkhana, nursery school, small cafeteria, Architect's office.
- Case study of existing house and its redesign and design of simple building elements.

**References:**

1. Time Savers Standards.
2. Architect's Data- Ernst Neufert
3. Architect's handbook- Charanjit Shah.
4. Form Space & order – Frantis, K. Chary

### 06.2.3.2

#### BUILDING MATERIALS-II

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

**Course over view:** This course looks at the materials that are either extracted or synthetically made. The manufacturing process, properties and uses are to be deliberated.

**Veneers and veneering:** Resin bonded plywood, laminated wood, insulating boards and other miscellaneous Boards. Varieties of Timber, Characteristics and Uses

- **Painting & varnishes:** Protective coating, paints, constituents of paints, their function, water paints, distempers, cement based paints, varnishes (oil and spirit), French polish, plastic emulsion paints, Anti corrosive paint, water proofing and damp proofing finishes.
- **Glass & Glass Products:** Composition, Glass fabrication, types of glass, wired glass, fiber glass, rock wool, laminated glass, glass Crete blocks, structural glass, their properties and uses in buildings.
- **Rubber:** Natural rubber, latex, coagulation, vulcanizing synthetic rubber.
- **Adhesives:** Natural and synthetic, their varieties, thermoplastic and thermosetting adhesives, epoxy resin.
- **Asphalt & Bitumen:** Natural and artificial products, forms to asphalt, emulsion, cement mastic bitumen felt, their properties and uses.
- **Plastic:** Types, thermo setting and thermo plastics, resins, common types of molding powders used fabrication of plastics, polymerization and condensation. Plastic coatings reinforced plastic, plastic laminates.

**References:**

- Engineering Materials- S.C. Rangwala.
- Building Materials-Bernard. H. Knight and Rena G. Knight.
- Engineering Materials-Deshpande.
- Engineering Material-Roy Chowdary.

### 06.2.3.3:

#### BUILDING CONSTRUCTION-II

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		6	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

- **Foundations:** Types of foundations, i.e. spread foundation, raft foundation, grillage foundation, pile foundation, bearing piles, precast & cast-in-situ piles; pile driving, foundation for black cotton soil, elementary knowledge about RCC foundation.
- **Temporary Structures:** Shuttering and centering scaffolding, formwork, timbering for trenches. Shoring, racking shores, flying shores and dead shores, underpinning.

The class and assignment work should be supplemented with appropriate site visits. Appropriate exercises may be done in the construction yard.

#### References:

1. ISI codes to be followed where ever relevant.
2. Building Construction-Sushil KUMar.
3. Building Construction-Bindra & Arora.
4. The Construction of buildings-Barry Vol.2
5. Building construction-W.B. Mckay vol.4

### 06.2.3.4: HISTORY OF ARCHITECTURE – I

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

#### Course overview:

History of architecture to be studied as history of development of building forms (3D) ornamentation, structural solutions, construction methods, plans and building façade, organization in relation to aesthetic / religious/social philosophy and environmental factors.

The study should focus on the general trends and not on specific examples/ buildings.

#### Course content:

- Architectural development in the ancient civilizations in Egypt and Mesopotamia, study of pyramids, temples, mastabas, ziggurats, etc.
- Architecture in the classic Greek and roman periods, temples, agoras gateways, circuses, amphitheatres, basilicas, etc.
- Architecture in the early Christian, Romanesque gothic, Byzantine, periods in Europe and rest of the world excluding Asia.

Internal evaluation will be through tests and/ or a seminar to be presented by each student using maps, plans, section/ elevations/ views and other diagrammatic and graphic means.

#### References:

6. A history of architecture – Sir Banister Fletcher
  7. Introduction to architecture – Stephen Gardner.
  8. A chronology of western architecture – Doreen Yarwood
  9. The great ages of architecture – Bodo Lichy
  10. Meaning in western architecture – Christian Noberg Schulz
- World architecture – an illustrated history – Trewin Copplstone and others

### 06.2.3.5: STRENGTH OF MATERIALS

Instruction Periods /Week		Credits	Marks		Duration Of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

- **Analysis of beams and frames**

Fixed and continuous beams, application of clapperayon's theorem of three moments, BM& SF diagrams, moment distribution method for continuous beams and frames including side away. Kani's method of analysis for structural frames.



- Columns and struts  
Bulking and crushing failures, types of end conditions, Euler's theory & equivalent length and slenderness ratio. Rankine's equation and IS code formula for critical load on columns.
- Direct and bending stresses, eccentricity about both axes, symmetric and Unsymmetrical sections. Wind press on walls and chimneys, retaining walls subjected to earth press.
- Torsion of shafts – introduction to the basic equation  $T/j = fs/R = Co/l$
- Arches- determination of horizontal thrust, radial shear and normal force, axial thrust, bending moment and shear force for three-hinged arch.
- Structural concepts in post & lintel construction and arch, dome, vault construction.

**References:**

1. Structural mechanics – Junnarkar
2. Structural mechanics – punmia
3. Basic structural analysis – CS Redd

**06.2.3.6: WATER SUPPLY & SANITARY ENGINEERING**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	50	
Studio	0	Externals	50		
Total	4	Total	100		

- Sources of water supply, types of sources, surface sources, underground sources, types of well construction, yield of a well, spacing of wells, sanitary protection of wells.
- Quality of water: meaning of pure water, impurities in water, analysis of water, physical, chemical and bacteriological tests, maintenance of purity of water, water borne diseases, suitability of water for trade purposes.
- Treatment of water: general theory and principles of sedimentation tank, coagulation of water, filtration of water, disinfection of water and water softening, colour, odour, taste and fluoridation.
- Distribution system of water: methods of distribution, service reservoirs, systems of supply of water, method of layout of distribution pipes.
- Pipe appurtenances, air valves, reflux valves, relief valves, scour valves, sluice valves, stopcocks, and use of pumps in water supply systems.

Sanitary engineering:

- Collection and treatment of refuse: methods of carrying refuse, system of sewerage, ventilation, clearing and maintenance, surface drains.
- Sewage: meaning of the term, catchbasins, clear out, drop manhole, flushing tanks.

House drainage:

- Principles of house drainage, traps, sanitary fittings, systems of plumbing, drainage plans, testing of drains and pipes, maintenance of house drainage system.
- Miscellaneous topics: septic tanks, use of pumps in sanitation, biogas disposal, soil disposal without water carriage, rural sanitation.
- Roads and pavements: different types, water bound macadam tar bitumen, asphalt and c.c. Roads, soils stabilization, murrum, brick and stone paving, drainage of roads, sub drains, culverts, ditches and gutters.

**Reference:**

1. Water supply and sanitary engineering-rangwala.
2. Sanitary engineering –v.n.ghe
3. Water supply engineering and sanitary engineering- s.k.husain

**06.1.1.8: SEMINAR-1**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		Internals	50	
Studio	0	Externals	50		
Total	2	Total	100		

**Course over view:** Architectural projects and presentations which are part of the first and second year curriculum are taken as the basis of training of the following skills.

- Communication skills – understanding the difference between seminars, conference, convention, congress, panel discussion, etc.
- Reading and listening comprehension. Taking notes from lectures, speeches, debates, etc. Interpretation and analysis of reports, text, technical literature.
- Writing skills:

Presentation ideas accurately and logically, précis writing preparation of letters, application forms and reports. Documentation and Presentation of Case Studies.

- Introduction to Computers:

Broad overview of hardware and software. Simple operations such as creating, editing, formatting, saving and printing documents.

Working knowledge of MS Word, Power Point and other word processing and presenting packages.

**Assessment**

- Each student is expected to individually present a review of an article from an architectural journal allotted to him/her by the faculty.
- Each student is also expected to present a written paper and a seminar at the end of the semester on a topic to be finalized in consultation with the concerned faculty.

Group Discussion on selected topics.

**Viva Voce:** Student should field book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner

**References:**

1. **How to write and speak better (Reader’s Digest).**
2. **The ABC’s of Window 3.1 Alan R. Neibaner.**
3. **Effective reports – Matra Treece.**

**SECOND YEAR, 2<sup>ND</sup> SEMESTER**

**06.2.4.1: ARCHITECTURAL DESIGN-II**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

**Course Overview:** This Course is designed to develop the skills of creative design synthesis for a single use, small span, single storey building.

**Course content:** The design issues to be addressed include:

- Functions and their spatial implications.
- Maximum and optimum areas for various functions.
- Anthropometrics, furniture layout and horizontal circulation.
- Interior volumes and material qualities.
- Lighting and ventilation.
- Integration of form and function.

The list of suggested topics to be covered as design problems including:

Balwadi, Kindergarten School, Primary Health Centre, Doctor’s Clinic, Small Cafeteria, Highway Restaurant, Village Post Office, Bank(branch office). Police Station, Architect’s Office, Department Store, School Gymkhana & Youth Club etc.,

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as design problems will have to be covered by the Studio faculty members through lecture/slide show sessions and site visits.

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.

**References:**

1. **Time savers standards of Building Types-Joseph de chiara & others.**
2. **A History of Building Types-Nikolays Pevsner.**
3. **Architect’s Data-Ernst Neufert.**
4. **Architect’s Hand book-Charanjit. Shah**
5. **Doctor’s offices & Clinics-Paul Hayden Kirck, Engene D. Sternberg.**

6. Time savers standards of Building Types-Joseph de chiara & others.
7. A History of Building Types-Nikolays Pevsner.  
Architect's Data-Ernst Neufert

### 06.2.4.2: BUILDING MATERIALS – III

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

**Course Overview:** This course looks at the materials that are composite in nature and their unique properties.

Reinforced Cement Concrete: light weight concrete, precast concrete, solid and hollow blocks, their sizes, precast lintels, fence posts, sleepers, roof components, and partitions.

RCC slabs with single and two-way reinforcement, beams, singly & doubly reinforced beams, columns, staircase, balconies, railings, RCC pre-cast units.

Innovative materials ex: composite materials generated from waste etc..

Post tensioned structures, Composite material, Tensile structures.

Usage of metals like steel, Aluminium, brass, copper etc as Building Materials.

**References:**

- Engineering Materials- S.C. Rangwala.
- Building Materials-Bernard. H. Knight and Rena G. Knight.
- Engineering Materials-Deshpande.  
Engineering Material-Roy Chowdary.

### 06.2.4.3: BUILDING CONSTRUCTION-III

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		6	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

- Flooring: brick on edge, concrete, wood, Indian patent floor, granolithic, terrazzo, pitch mastic, magnesium oxide, chloride, shahbad or flagstone.
- Ground and upper floors: solid floor, brick flooring, flag stone or shah bad stone flooring, floor finishing and floor coverings. Basement floor and retaining walls.
- Wooden ground and upper floors – terms defined, bridging, joists, binder beams and girders, solid and herringbone strutting, floor boards, ceiling joists, trimming floors to accommodate fire place. Details of fireplace. Flat roofs. Madras terrace, jack arch roofs.

The class and assignment work should be supplemented with appropriate site visits. Appropriate exercises may be done in the construction yard.

**References:**

1. Building Construction\_Sushil Kumar
2. Building Construction\_S.P Arora, S.P Bindra
3. Building Construction\_Mitchell (Elementary and Advanced)
4. Building Construction\_Mc Kay, Vol-I, II, III and IV.

### 06.2.4.4: HISTORY OF ARCHITECTURE-II

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

**Course Overview:**

- History to be studied as history of development of built forms (3D) And ornamentation, Structural solutions, construction methods, plan and building façade organization in relation to Aesthetic/religious/social philosophy and environmental factors.
- The study should focus on the general trends and not on Specific examples of building.

**COURSE CONTENT:**

- HINDU ARCHITECTURE: Development of architecture in India and rest of Asia, from the earliest times up to the end of the fourth century: Indus valley, Buddhist Architecture, Rock cut Examples, Deccan School < ancient text on Hindu Architecture and art, Hindu and Jain examples from Orissa, Khajuraho,

Gujarat etc., Chalukyan Architecture, south Indian Temple Development from the period of later Pallavas to later Cholas and Pandyas.

- ISLAMIC ARCHITECTURE: Early Saracenic School in India:
- Imperial school at Delhi provincial schools at Gujarat and Deccan.
- Moghal Architecture in India.

**References:**

1. Art Architecture of India-Benjamin Rowl.
2. Indian Architecture-Percy Brown.
3. The Architecture of India-Satish Grover.
4. The history of Architecture in India-Christopher Tadgell.
5. Vistara-The Architecture of India

**06.2.4.5: CLIMATOLOGY**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		Internals	50	
Studio	2	Externals	50		
Total	5	Total	100		

**Introduction to Building Climatology**

Climate and built form interaction. Global climatic factors, elements of climate, graphic representation of climatic data, Mahoney’s Tables, macro & microclimate.

**Tropical Climates**

Definition, classification of tropical climates, characteristics of different climatic zones, Design considerations for warm-humid, hot-dry, composite and upland climates

**Thermal Comfort**

Thermal comfort factors physiological aspects body heat balance, comfort range, Comfort charts.

**Heat Flow Through Buildings**

Basic principles of heat transfer through buildings, performance of different materials, Periodic heat flow.

**Sun And Design Process**

Solar geometry, solar charts, sun angles and shadow angles, orientation for sun, sun control, design of shading devices building form and heat gain, basic principles of day lighting, sun light and glare.

**Natural Ventilation**

Air movement around and through buildings, orientation for wind stack effect, including ventilation.

**Passive Cooling**

Passive methods of cooling, roof pond, dessicant cooling, vaporative cooling, earth sheltered buildings.

**REFERENCES:**

1. Manual of tropical housing and building-koenigsberger, ingsoll, mayhew and szokolay.
2. Buildings climate and energy –T.A.Markus andE.N.Morris.
3. Tropical Architecture – C.P.Kukreja.
4. Design for hot climates-Allan Konya.

Solar Control and Shading Devices – Olgyay and Olgyay

**06.2.4.6: DESIGN OF RCC STRUCTURES**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	50	
Studio	0	Externals	50		
Total	4	Total	100		

- Introduction to RCC design
  - Neutral axis; balanced, under & over reinforced sections.
- Design of Flexure Members
  - Design of beams for flexure, shear & bond.
  - Design of doubly reinforced beams.
  - Design of one way & two way reinforced slabs.
  - Design of lintels, cantilever beams and slabs.
  - Design of T beams.
- Design of columns & footings
  - Design of R.C.C. columns, axially & eccentrically loaded Columns, columns subjected to BM about one & two axis.
  - Design of staircase.
  - Design of R.C.C. footings for columns.

**Reference:**

1. Analysis of structures vol.II by Vazrani Ratwani.
  2. Design of R.C.C. structures-S.Ramamrutham.
- Analysis Design and Details of structures vol. IV

### 06.2.4.7: ENVIRONMENTAL SCIENCES (\*\*MEC 223)

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	30	
Studio	0	Externals	70		
Total	4	Total	100		

\*\*Common with Mechanical Engg. and Naval Architecture)

**Module 1: Introduction** Definition, scope and importance  
Measuring and defining environmental development : indicators (1 Lecture)

**Module 2 : Ecosystems** Introduction, types, characteristics features, structure and functions of Ecosystems - Forest, Grassland, Desert, Aquatic (lakes, rivers, and estuaries) (2 Lectures)

**Module 3 : Environment and Natural Resources Management** Land resources: Land as a resource

Common property resources , Land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer-pesticide problems  
Forest resources: Use and over-exploitation, Mining and dams-their effects on forest and tribal people  
Water resources: Use and over-utilization of surface and ground water, Floods, draughts, Water logging and salinity, Dams-benefits and costs, Conflicts over water

Energy resources: Energy needs, Renewable and non-renewable energy sources, Use of alternate energy sources, Impact of energy use on environment .(8 Lectures)

**Module 4: Bio-diversity and its conservation** Value of bio-diversity - consumptive and productive use, social, ethical, aesthetic and option values. Bio-geographical classification of India – India as a mega diversity habitat . Threats to biodiversity-Hot-spots, habitat loss, poaching of wildlife, loss of species, seeds etc. Conservation of bio-diversity-In-situ and Ex-situ conservation (3 Lectures)

**Module 5: Environmental Pollution – Local and Global Issues** Causes, effects and control measures of

Air pollution,Indoor air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Solid waste management, composting, vermiculture, Urban and industrial wastes, recycling and re-use

Nature of thermal pollution and nuclear hazards, Global Warming, Acid Rain, Ozone depletion (8 Lectures)

**Module 6: Environmental problems in India** Drinking water, Sanitation and public health, Effects of activities on the quality of environment, Urbanization, Transportation , Industrialization, Green revolution  
Water scarcity and Ground Water depletion, Controversies on major dams – resettlement and rehabilitation of people problems and concerns, Rain water harvesting, cloud seeding and water shed management(5 Lectures)

**Module 7: Economy and Environment** The economy and environment interaction , Economics of development, preservation and conservation, Sustainability : theory and practice, Limits to Growth ,Equitable use of resources for sustainable lifestyles , Environmental Impact Assessment (4 Lectures)

**Module 8: Social Issues and the Environment** Population growth and environment, Environmental education, Environmental movements, Environmental Development (2 Lectures)

**Module 9 : Institutions and Governance** Regulation by Government, Monitoring and Enforcement of environmental regulation, Environmental Acts, Water (Prevention and Control of pollution) act, Air Prevention and Control of pollution) act, Env't. Protection act, Wild life protection act, Forest Conservation act, Coastal Zone Regulations, Institutions and policies relating to India,Environmental Governance(5 Lectures)

**Module 10 : International Conventions** Stockholm Conference 1972, Earth Summit 1992, World commission for environmental Development (WCED) (2 Lectures)

**Module 11: Case Studies** Chipko movement, Narmada Bachao Andolan, Silent Valley project, Madhura Refinery and Taj Mahal, Industrialization of Pattancheru, Nuclear reactor at Nagarjuna Sagar, Tehri dam,Ralegaon Siddhi (Anna Hazare), Kolleru lake – aquaculture, Florosis in Andhra Pradesh(3 Lectures)

**Module 12: Field work** Visit a local area to document and mapping environmental assets – river / forest / grass land / hill / mountain Study of local environment – common plants, insects, birds, Study of simple ecosystems – pond, river, hill slopes etc., Visits to Industries, Water treatment plants, affluent treatment plants.(5 Lectures)

## THIRD YEAR, 1<sup>st</sup> Semester

### 06.3.5.1: ARCHITECTURAL DESIGN – III

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

Course overview: This course focuses on buildings of residential use. It aims to enhance the students understanding of the complexities of architectural design for residential needs and develop creative design solutions for good living environments.

#### Course Content:

- Organisation of functional activities in relation to user requirements and the site.
- Relating the system of horizontal & vertical circulation, open spaces, parking etc.
- Responding to socio-economic factors such as income levels, privacy, territoriality, socializing etc.
- Considering materials, structure and services in relation to the design proposal.
- Integration of plan forms & three dimensional compositions.
- Detailing for the physically handicapped and the elderly.

The list of suggested topics to be covered as design problems include:

Large guest house, students hostels, small hotel, holiday resort, motel, row housing, block of flats and residential complexes at an intermediate scale such as staff housing, housing for specific communities in urban and rural areas such as home for the aged, fishermen's housing etc.

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered, as design problems will have to be covered by the studio faculty members through lectures/slide shows and case studies.

Atleast 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.

#### References:

1. **Time Saver Standards of Building Type\_Joseph de chiara & others.**
2. **A History of Building types\_Nikolaus Persner.**
3. **Architect's Data\_Ernst Neufert**
4. **Hand book of Planning and Design Data**
5. **Barrier free Residential Design\_Albert Peloquin**
6. **Site Planning for Cluster housing\_Richard untermann and Robert Snall**

### 06.3.5.2: BUILDING CONSTRUCTION – IV

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		6	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

- Staircases: Terms defined, Tread, riser, stringer, nosing, flight, landing, head room, handrail, types of stairs i.e., straight, doglegged, open well geometrical, circular, spiral, bifurcated, balusters, newel post etc., wooden stairs, stone stairs metal stairs and elementary knowledge of R.C.C. stairs.
- Roofing, flooring and ceiling materials: roofing tiles asbestos cement products, sheets, fiber board and wood fiber boards, gypsum boards etc.,
- **Wall Finishes:** Acoustic treatment, insulation etc..
- **Modular components:** offices, kitchens, toilets etc..

The class and assignment work should be supplemented with appropriate site visits. Appropriate exercises may be done in the construction yard.

#### References:

- 1.**Building Construction\_Sushil Kumar**
- 2.**Building Construction\_S.P Arora, S.P Bindra**
- 3.**Building Construction\_Mitchell (Elementary and Advanced)**
- 4.**Building Construction\_Mc Kay, Vol-I, II, III and IV**

### 06.3.5.3: HISTORY OF ARCHITECTURE-III

Instruction Periods per Week		credits	marks		Duration of Exam
Lectures	3	3	Internals	50	3 Hrs
Studio	0		Externals	50	
Total	3		Total	100	

- Course Overview:
- History to be studied as development of built forms (3D) and ornamentation, structural solutions, construction methods, plan and building façade organization in relation to aesthetics/religious/social philosophy and environmental factors.
- The study should focus on the general trends and not on specific examples of buildings.
- Course Content:
- Renaissance, Baroque and other architectural styles preceding the advent of Industrial Revolution in Europe.
- Influence of architectural Revolution on building materials, Construction Technology, evolution of new building types and increasing user requirements.
- Characteristic styles of modern architecture up to First World War.
- Steel structures, Arts and crafts movement, Art Nouvean Vienna school, Chicago school, Monumentalism. Expressionism and beginning of R.C.C.
- Contributions made by pioneers- Le Corbusier, Frank Lloyd Wright, Walter Gropius, Mies Van der Rohe in the periods between the world wars. Characteristics of modern architecture after the Second World War. Study of Aalto. Ero Saarinen, Richard Neutra, Louis I Khan, Philip Johnson, Kenzo Tange and also engineer architects like Pier Luigi Nervi, Felix Candela, Buckminster Fuller, and frei Otto.
- Pre-Independence architecture in India: Development of secular architecture from the end of the 18<sup>th</sup> century to the middle of the 19<sup>th</sup> century.

#### REFERENCES:

- **History of Modern architecture –Leonardo Benevolo.**
- **Space, Time and architecture –The growth of a New Tradition –Sigfried Guiedion.**

### 06.3.6.4: SPECIFICATIONS, ESTIMATING AND COSTING

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4	2	Internals	50	3 Hrs
Studio	0		Externals	50	
Total	4		Total	100	

Course over view: This course is intended to impart training in the preparation of Specifications and Estimation for a building.

Course content: Definitions and terms used principles of measurements in estimating. Methods of preparing approximate estimates on plinth area and cubic contents ( volume ) basic differences and advantages.

Method of obtaining detailed quantities for earth works , building items and other allied structures ( P.W.D. system to schedule of rates, standard mode of measurements. Example and exercise in obtaining all items from excavation to painting including RCC and steel works.

Specifications : brief speciation of different items in a building.

Defining specifications; Purpose of specifications

- as a contract document

-As a guide to builder and supervisors.

-Importance of specifications in the execution of building projects with respect to drawings.

-Types of specifications

-Manufacture's specifications.

-Detailed clause writing of specifications of any three items of work for a normal standard building with at least three other items as part of the internal assessment from the following:

a) Earth work excavation in all types of soils including blasting operations.

b) Foundation in CRS and UCRS in RCC

c) Superstructures in brick masonry.

d) RCC work in slabs, sunshades, lintels, etc.

e) Doors and windows in wood and steel.

f) Finishing work (I) painting, (II) flooring, (III) cladding.

g) Built in furniture.

- h) Partitions.
- i) Modes of measurements.

Knowledge of manufacturers specifications as a database for writing specifications for the following materials, components of the building based on surveys:

- Glass
- Plywood and laminates
- Hardware
- Electrical wires and accessories
- Water supply and plumbing: fittings and fixtures
- Flooring and cladding

NOTE: This has to be taken by the students in the form of surveys monitored by the teacher. The end out put should be in the form of a report submitted by the students consisting of the specifications writing as given above.

**REFERENCES:**

- 1.) **Estimating and costing in Civil Engineering by B.N. Dutta**
- 2.) **Standard Schedule of Rates – C.P.W.D**

**06.3.5.5: LANDSCAPE DESIGN AND SITE PLANNING**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		4	Internals	
Studio	1	Externals		50	
Total	4	Total		100	

- Man and the landscape: landscape development in historical perspective – brief review of development of garden styles. Importance and role of landscape in architecture. Contemporary approach to landscape design – brief review of evolution of concepts in landscape design after industrial revolution and increasing awareness of ecological variables in landscape design.
- Site studies and site planning:  
 --- Understanding different site characteristics and evaluation of their potential for development.

--- Philosophical and design issues related to site development –i.e. siting of buildings, spatial and contextual relationships of built and out door spaces, site and its relationship to its surroundings. Importance of climatic, social factors in development of site.

--- Process of design development. Identifying functional requirements of site, development of site by mutual exploitation of forms and use of grading principles. (study should include atleast two exercises in site planning)

- Elements in Landscape design:  
 Use of landform, water, vegetation as elements of Landscape design  
 Design and types of garden furniture, lighting and water feature  
 Pavement types, patterns, and hard landscapes  
 Sculptures and architectural features and elements Design concept related to use of landscape elements in outdoor design - Grouping of elements, visual effects etc.
- Plants and design:  
 Botanical nomenclature, anatomy and physiology  
 Plant growth and development, plant communities and their environments in Indian Context  
 Plants and landscape - Basic principles, appearance of plants, functional and visual effects with plants in landscape  
 Landscape layout and planting techniques  
 Planting design and practice
- Landscape Construction:  
 Elementary knowledge of grading cut and file, shaping the site  
 Use of materials use in landscape and their details  
 Laying paths with different materials like pebble paving slabs, stone etc  
 Construction of garden steps  
 Construction of screen, trellis, wall fences, gates, decks  
 Construction and detailing of drain inlets, curbs and gutter details  
 Fountain and pool construction  
 Elementary knowledge of irrigation systems, and water supply, lighting systems

**Reference:**

1. **Site planning – Kelvin Lynch**
2. **An introduction to Landscape Architecture – Michael Laurie**
3. **Landscape Construction and detailing – Alan Blanc**
4. **T.S.S. for Landscape Architecture**
5. **Planting Design – Bian Hacheat**
6. **Land and Landscape – Brenda Colise**
7. **Common trees – Snatapaer**
8. **Beautiful Shrubs – Prathiba Devi**



### 06.3.5.6: DESIGN OF STEEL STRUCTURES

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

- Introduction to Steel structures: Steel structural shapes, Introduction to IS 800; Rivets, Design of steel structural members – tension, compression and bending members
- Design of Beams, Columns & Footings: Design of beams; checks for shear and deflection, define plate girders Design of built-up beams (with flange plates only)
- Design of connections: Design of riveted and welded connections including the beam end connections
- Design of columns: Design of axially loaded steel columns Design of built-up columns (Lacing)
- Design of foundations: Design of base plate, gusset plate and concrete footings for steel columns Design of grillage foundations

The class and assignment work should be supplemented with appropriate site visits

#### Reference:

**Design of Steel structures – Ramamrutham**  
**Analysis, design and details of structures Vol. III: Steel structures – Vazirani**

### 06.3.5.7: COMPUTER AIDED DESIGN

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	0		3	Internals	
Studio	5	Externals		50	
Total	5	Total		100	

- Course Overview: To acquire drawing skills using a computer  
 Course Content: Introduction to drafting on computer with a drawing application:
- Application

- Menu
- Key board Commands
- Scale and formatting
- Drawing handling and saving
- Output plotting
- Layers
- Object colour
- Display
  - Drawing of plan of residence with layers showing all the building components, titles, and dimensions, hatching. Two exercises to be done in the lab.
  - Introduction to 3D
    - View points
    - Objects
    - Surfaces
    - Shading
    - Wire frame
    - Editing of simple objects

#### REFERENCES:

- **Auto CAD Release 2000 –by Georgeomura**
- **Engineering drawing with Auto CAD 2000 –T.Teyapoovan**
- **Inside Auto CAD –Daniel Rather and Habert Rice**

### 06.3.5.8: SOFT SKILLS

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		1	Internals	
Studio	0	Externals			
Total	3	Total		100	

#### Communication:

- Importance of communication
- Non verbal communication
- Personal appearance

Posture  
Gestures  
Facial expressions  
Eye contact  
Space distancing

**Goal setting:**

Immediate, short term, long term,  
Smart goals, strategies to achieve goals

**Time management:**

Types of time  
Identifying time wasters  
Time management skills

**Leadership and team management:**

Qualities of a good leader  
Leadership styles  
Decision making  
Problem solving  
Negotiation skills

**Group discussions:**

Purpose (Intellectual ability, creativity, approach to a problem, solving, tolerance, qualities of a leader)  
Group behaviour, Analysing performance

**Job interviews:**

Identifying job openings  
Preparing resumes & CV  
Covering letter  
Interview (Opening, body-answer Q, close-ask Q),  
Types of questions

**Reference books:**

1. 'Effective Technical Communications' by Rizvi M. Ashraf, McGraw-Hill Publication
2. 'Developing Communication Skills' by Mohan Krishna & Meera Banerji, Macmillan
3. 'Creative English for Communication' by N.Krishnaswami & T.Sriraman, Macmillan
4. 'Professional Communication Skills' by Jain Alok, Pravin S.R. Bhatia & A.M. Sheikh,

S.Chand & Co.

## THIRD YEAR, 2nd Semester

### 06.3.6.1: ARCHITECTURAL DESIGN – IV

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

**Course overview:** This course focuses on the discipline of institutional design and detailing skills required for the design of institutions in urban contexts.

Course content: the following issues relating to institutional design will be addressed to:

- Nature of contemporary institution, correlation to urban structure.
- Development control and urban infrastructure affecting design.
- Various attitudes to building in urban context.
- Integration to function and movement, climate, and sound, structure and services into group of buildings
- Landscaping and site planning.
- Institutional character – from abstract to detail.
- User behavior and requirements pertaining to the physically handicapped.

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as studio faculty members through lecture/slide shows and site visits may cover design problems.

The topics to be covered as design problems may include:

- Institution of learning – colleges with it's various departments such as medical, engineering, law, business, music, and dance colleges, vocational training institutes etc.
- Institutions of life such as hospitals, reformatories and rehabilitation institutes for the disabled.
- Institutions of research in various disciplines.
- Local/legal institutions such as the high courts, secretariat, development authorities, directorates etc.

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

#### REFERENCES:

- **Libraries - allan konya.**
- **Institutional buildings architecture of controlled environment –louis g.stone.**
- **Hospital architecture and beyond – isodore rosenfield.**
- **Time savers standards of building types – joseph de chiara & others**
- **A history of building types – nikolaus pevsner**
- **Architects` data - ernst neufert**
- **Handbook of planning and designing data .**
- **Doctor`s office & clinics – paul hayden kirk ,engene d.sternberg.**
- **Libraries for schools and universities – triedmann wild.**
- **Practical laboratory planning. – w.r. tergsone.**

### 06.3.6.2: BUILDING CONSTRUCTION-V

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		5	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

- Structural steel work: general principles and terms defined, standard sections i.e. beams, joists, angles, channels, tees, bolts, rivets and welding.
- Plate girder, lattice or warren girder, details of jointing, steel trusses for various spans. Steel frame structure: stanchions, main and secondary beams, details of connections by riveting, welding, bolts and nuts.
- Tubular steel roof truss, monitor roof, north light truss, lantern light (wooden and steel), dome light, dormer windows, structural practice and drawings as per IS code. The class and assignment work should be supplemented with appropriate site visits. Appropriate exercises may be done in the construction yard.

#### References:

1. **Building Construction-W.B.Mckay vol.IV.**
2. **Advanced Structures-Mitchell.**
3. **Building Construction-S.P.Arora and S.P.Bindra**

### 06.3.6.3: DEVELOPMENT OF CONTEMPORARY ARCHITECTURE

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		3	Internals	
Studio	0	Externals		50	
Total	3	Total		100	

#### Course Overview:

- Contemporary Architecture to be studied as development of built forms (3D) and ornamentation, structural solutions, construction methods, plan and building façade organization in relation to aesthetic/religious/social philosophy and environmental factors.
- The study should focus on the general trends and not on specific examples of building.

#### Course Content:

- Understanding of Contemporary trends in architecture in India Trends in architecture of India after Independence. Influence of Le Corbusier and Louis I . Khan. Studies of the ideas and works of B.V. Doshi, Charles Correa, Raj Rewal, J.A.Stein, Achyut Kanvinde, Anant Raje, Uttam Jain, Hasmukh Patel, Laurie Baker, Chandravarkar & Thacker, Hafeez Contractor, Nari Gandhi, Shirish Beri, Romi Khosla, Ranjit Sabiki, Anil Laul, Shashi Bhooshan, Jaisim, Bimal Patel etc., Familiarisation with the works of architecture at Auroville.
- Understanding of contemporary directions in architecture in the rest of the world through studies of the ideas and works of Robert Stern, Charles Moore, Goeffery Bawa, Michael Graves, Richard Meyer, Aldo Rossi, Frank Gehry, Rob Krier, Hassan Fathy, Renzo Piano, Richard Rogers, Norman Foster, Tado Ando etc.

#### References:

- Contemporary architecture: Ann Lee Morgen and Colin Mayer.
- After the masters: Vikram Bhatt.
- Architecture of Independence: John Lang, Mickey Desai, Madhavi Desai.
- Post Independent Architecture: S.S.Bahga.
- The language of Post Modern Architecture: Charles Jencks.
- The Architecture of the city- Aldo Rossi.

### 06.3.6.4: WORKING DRAWINGS

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		6	Internals	
Studio	4	Externals		0	
Total	6	Total		100	

#### COURSE OVERVIEW:

- This course is intended to impart training in the preparation of working drawings for buildings with specific reference to the code of practice for architectural and structural drawings as per IS CODE. NO.962 of 1969 and actual writing of detailed clause-by-clause specifications as complimentary to the working drawings.

#### COURSE CONTENT:

- Preparation of working drawings to suitable scales indicating clearly:
  - The method of giving dimensions: architectural and structural, on plans at various levels, elevations and sections.
  - The brief specification of materials of finishes on the drawings.
  - Architectural details to a large scale showing application of materials of finishes and other constructional details.
  - Location of built up areas in the site plan showing approach roads, paths and layouts of all services such as water supply, sewage disposal and electrical connections.
    - NOTE: Atleast two working drawing sets preferably one for a small residential building and one for multistoried building, based on the design done by students shall be prepared.

Following detailed drawings should be prepared in each set:

- Centre line plan
- Foundation plan
- Structural grid plan (in case of framed structures)
- Basement floor plan
- Ground floor plan
- Typical floor plan
- All elevations

- All sections: one atleast through staircase and one through toilet
- Terrace floor plan giving details of surface drawing etc
- Sanitation drawings showing fixtures etc
- Electrical layout plan
- Typical wall profiles sections
- Detailed drawings of special rooms like kitchens, toilets, staircase etc
- Structural drawings giving all details
- In addition to the above, students are expected to prepare a detailed clause by chance specifications for atleast one of the 3 projects Specifications writing include the following aspects:
- Materials
- Pre and post installation work
- Test, if any
- Mode of measurements
- Knowledge of manufacturers specifications as a database for writing specifications for the following materials, based on surveys:
  - Glass
  - Plywood and laminates
  - Hardware
  - Electrical wires and accessories
  - Water supply and plumbing: fittings and fixtures
  - Flooring and cladding

**Viva Voce:** Student should submit drawings and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner

**REFERENCES:**

- **Building construction specification –Jack Lerrs**
- **Standard specification of state governments**
- **Specification in detail –Frank W.Makay**
- **Building Drawing – M.G.Shah, CM,Kale, S.Y.Paoui**
- **Architectural Working Drawings –Ralph W.Liebing, Mimi Ford Raul**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

- **Electrical services:** Fundamentals of electricity, voltage, generation and distribution of power, HT and LT. Three- (3) phase current sub station, generator, UPS.

- **Building using system:** electricity, circuit, service wires, household, meter and circuit breakers, ISI standard materials switch boards, light circuits and power circuits using for general buildings.

- **Domestic Application:** Construction and working of atleast six domestic appliances.
  - Voltage
  - Electric motor types
  - Safety
  - Location in a building.

- **Lighting:**
  - Comparison, advantage and disadvantages
  - Types of Artificial light source,
  - Methods of lighting Direct, Indirect.
  - Lighting system adapted in building, eg: suspended lighting, concealed lighting, spot lighting, under water lighting & task lighting.
  - Illumination level (NBC) nominal calculations of lighting for small application.
  - Decorative lighting, flood lighting of buildings.

**Air Conditioning:**

- Different types of air conditions single zone, Multi zone, Equipment and Systems.
- Condenser, Compressor, evaporator, heat exchanger
- Window air conditioning, Split air conditioner, Duct able air conditioner.
- Central air conditioning
- All air system

**06.3.6.5: ELECTRICAL & MECHANICAL UTILITY SERVICES**

- Chilled water system.
- FC unit.Ducting.

**References:**

1. **Electrical Wiring & Contracting (Vol.1 to Vol.4)**
2. **Electrical Engineering Hand Book by Dr.Frith Abnwo &Others.**
3. **Mechanical & Electrical Equipment for Buildings by Willim J.Mc Guinness.**
4. **Handbook of Mechanical & Electrical systems for Buildings by H.E.Bovay.**

**06.3.6.6: HUMAN SETTLEMENTS**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		3	Internals	
Studio	0	Externals		50	
Total	3	Total		100	

CONTENT: Brief review of the origin of early human settlements, factors responsible, Brief introductory study of the development of various settlement forms up to and after the industrial revolution in Europe, U.S and India in particular.

Type and classification of settlements of Urban and Rural, according to formal, administration norms (census etc.) and according to planning theories.

Physical differences and relationships between Urban and Rural settlements. Out of economic and other functional factors implication in settlement planning a very brief introduction to the theory of 'EKISTICS'.

Urbanization – Fact, elementary theories and problems related to urbanization with social reference to India.

Ecological, social and economic aspects of town planning in India. Brief introduction to the town planning organization in India (National & Local) and contemporary policies/programs related to urbanization and urban development at the national level

in India. Brief introduction to the implication to town forms in urban planning and development processes.

Introduction to the various levels of planning National, Regional, Urban, Rural, Local etc. emphasizing the differences and relationship among them.

Basic terms & definitions used by town planners in describing urban areas and their development – such as gross density, net density, floor space index, central business district, land use etc.,

Transportation and communication, potentials and limitations of road-ways, railways, airways and water ways in the development of settlements. ”. Introduction to the concepts of green belts, satellite towns, neighborhood, roads in solving some of the problems in urban development. Indian context: Growth pattern of urban and rural settlements; problems and potentials.

NOTE: The main aim of the subject is to make the student aware of the factors that constraint and assist in architectural design of the settlements.

**References:**

1. **EKISTICS-An introduction to the science of Human Settlement- C.L.Doxiadis.**
2. **House, Form and Culture- Amos Rappoport.**
3. **Urban Pattern – Arthur.B.Galeon.**
- 4.

**06.3.6.7: STRUCTURAL ENGINEERING**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

1. **Retaining Walls:** Cantilever and Counter fort types, Design of Cantilever types of Retaining wall.

2. **Prestressed Concrete Structures:** Principles, Materials, Classification, General information about devices, Equipment, Analysis for stress, Simple calculations involved in Design of Cross-section details (P, e, Safe stresses).
3. **Plastic Analysis:** Introduction to Plastic analysis and Design of beams.
4. **Introduction to Standard Software packages for estimating Structural Analysis and Design.**

## FOURTH YEAR, 1<sup>st</sup> Semester

### 06.4.7.1: ARCHITECTURAL DESIGN-V

Instruction Periods per Week		Credits	marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

**course over view:** This course focuses on the design of multi-use and multi-span buildings and aims to develop skills required for evolving suitable designs for large public use complexes.

**Course content:** The design issues to be addressed include:

- Site and climate conditions.
- Socio-economic conditions.
- User behaviour and requirements.
- Space conservation in urban areas.
- Form and function.
- The system of horizontal and vertical circulation.
- Landscaping and site planning.
- Structure and services.
- Communication.
- Design details pertaining to the disabled.

The topics to be covered as design problems may include:

- Inter state or inter city bus terminal.
- Cinema theatre.
- Multipurpose hall.
- Sports complex.
- Auditorium.
- Community center.
- Kalyana mandapam.
- Information center
- Entertainment center.
- Museums and art galleries.

At least two major exercises and two minor design/time problems should be given. A model must be submitted along with at least one of the two main problems.

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as the studio faculty members through lecture/slide shows and site visits may cover design problems.

**Viva Voce:** Student should submit drawings of the design problem and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner

**REFERENCES:**

1. **Central city malls-harvey m.ruknitein.**
2. **Play ground and recreational spaces-hedderman,Alfred.**
3. **Design and planning for swimming spaces-john daues.**
4. **Time savers standard of building types-joseph de chiara & others.**
5. **a history of building types- nikolaus pevsnr.**
6. **Architect’s data-ernst neufert.**
7. **Architect’s hand book-charanjit .shah.**

**06.4.7.2: BUILDING CONSTRUCTION – VI**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		5	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

Constructional details of various structures in steel, pre stressed concrete. Portal frame, folded plates, stadium stands etc.  
Geodesic principles and cellular structures, cable net construction and tensile structures.

Building failures, maintenance and renovation; causes of decay and damage in old buildings:

**Preliminary inspection:** general observations, general decayed elements, difference between decay and damage.

**Timber:** use of timber, moisture content, control, prior to installation, strength reducing factors; approach to the repairs to the roofing system.

**Bricks:** strength of brick work; effect of ageing; weathering, temperature variations on brick work, joints and cracks, construction errors, repairs and maintenance.

**RCC Concrete:** mixing at site, structural design in repair job, causes of failure in concrete structures, guniting, pressure grouting.  
Propping; strutting, underpinning and wedges.

Methodical approach to problems of repairs: decayed ends of floor joists; cracks over openings; sinking and sagging of balconies; repair to floors; jack arch, Madras terrace; foundation sinking; repairs to wall stair cases, WC blocks etc.

Some unusual problems: In situ brackets for supporting floor joists, repair to big span rooms; water proofing to terrace; case studies and site visits.

Renovations: provision of chajja; renovation of balconies, external lintels; removing old flooring and providing alternate flooring. Multistoried structures and extensions, above one or two storeyed buildings without actually loading it.  
False ceiling, Shelves and Built in mesh.

The class and assignment work should be supplemented with appropriate site visits.. Appropriate exercises may be done in the construction yard.

**References:**

1. **Shell structures by Felix Candella**
2. **Learning from failures (vol 1 and vol 2) – Raikar.**
3. **Failure and repair of concrete structures – S.Champio.**
4. **Advanced reinforced concrete design – N.Krishna Raju.**

**06.4.7.3: BUILDING ACOUSTICS**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		3	Internals	
Studio	0	Externals		50	
Total	3	Total		100	



- Need to study acoustics; pioneers and their works.
- History of acoustics examples from the part, buildings and methods used for good acoustics.
- Generation, propagation, transmission; reception of sound; sound waves, sound pressure and other factors, decibel scale.
- Characteristics of sound in speech and music-loudness, frequencies etc.
- Sensibility of human ear, subjective effects.
- Behavior of sound in enclosed spaces.
- Resonance, reverberation time, simple exercises using Sabine`s formula, acoustical requirements of different types of building.
- Effects of geometry and shape; acoustical properties of building materials, absorption coefficient; choice of materials.
- Echoes, reflectors; sound amplification and distribution.
- Principles of acoustical design process.
- Source and type of noise in and around buildings, methods of noise control.
- Sound isolation, speech, privacy, and electronic sound systems, Case studies of auditorium.

**References:**

- 1.Environmental Acoustics-Leslie L.Poella.
- 2.Design of good acoustics-J.E.Moore.
- 3.Acoustics for the Architect-Harold Burris, Reinhold.
- 4.The Architecture of sound by Peter Lord, Duncan Templeton.
- 5.Architectural Acoustics-David Eager.

**06.4.7.4: TOWN PLANNING**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	50	
Studio	0	Externals	50		
Total	4	Total	100		

- A brief introduction to the implication of town forms in urban planning and development processes, Introduction to the various levels of planning: national, regional, urban, rural, local etc; emphasizing the differences and relationships among them.

- A general and introductory study of inputs, objectives, preparation and outputs of Master plan for a city; land-use classification, features and relationships with transportation. Meaning and use or implication of O-D surveys, desire line diagrams trip generation, attraction, distribution and model split.
- Introduction to housing and community facilities; role of F.S.I, densities in housing.
- Basic methodology for planning of industrial areas and recreation areas.
- Brief introduction to redevelopment schemes and urban renewal, problem of slum and shanty areas and a review of the concepts regarding solutions: clearance, rehabilitation and improvement.
- Standards and norms evolved by TCPO.
- Ecological, social and economic aspects of town planning in India.
- Brief introduction to the town planning organization in India (national and local) and contemporary policies/programmes related to urbanization and urban development at the national level in India.

At least one exercise related to the preparation of a layout for a residential neighbourhood of about 5000 populations.

- General aim and principles of development control in urban areas, legislation as a tool in town planning; aim and general principles of building byelaws. Rules, regulations, and other laws related to urban development and planning, like: land acquisition, land ceiling, model town and regional planning acts, etc; with special reference to Andhra Pradesh.

**References:**

1. Town Planning- Rangwala.
2. Planning the Indian city-Mahesh.N.Buch.
3. Strategies in Development Planning Edited-Alok Kumar Singh, Vinay Kumar Rao, Anand Promod Mishra.
4. Land-use Planning Techniques of Implementation-T.William Patterson.
5. Land Acquisition Manual in Andhra Pradesh-E.L.Bhagiratha Rao.
6. Urban and Rural Development in India. By R.K.Khosla.
7. Commentanes on hand Reforms laws in Andhra Pradesh-Padala Rama Reddy, Padala Srinivasa Reddy.
8. Hyderabad Urban Development Authority.
9. Urban and Regional Planning-K.S.Rame Gowda.
- 10.Regional Planning in India by Mahesh Chand., Vinay Kumar Puri.

### 06.4.7.5: BUILDING ECONOMICS AND SOCIOLOGY

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	3		3	Internals	
Studio	0	Externals		50	
Total	3	Total		100	

General and brief introduction to the economics of each of the Following inputs into building, land, labour, capital and materials.

Lands: Basics of urban land economics , land uses, and land values, values vs. price-influence of government policies and action ( ethnic, Socio-economic) in the building industry – efficiency. Skills – case for labour intensive vs. capital

1. Capital: Capital accumulation, sources of finance, (public and Private) interests, rents, taxes insurance recurring costs, disposable income, and expenditure Patterns.  
Materials: Traditional Vs industrial- high technology, demand and supply performance vs. cost factors

2. General Economics concepts: Cost and cost indices, cost control preliminary cost analysis – financing for projects – economic feasibility reports, returns, etc., cost appraisal, cost projection, elements of valuation reports.

- 1.Elementary idea of economics planning – broad features of the on going five year plan with special reference to social and economics factors effecting location, construction and financing of the building industry and housing in particular.

- 2.Agencies /institutions/organizations – directly or indirectly influencing economic aspects of an architectural project.

#### Part –B SOCIOLOGY

Family as the basic units of ‘society’ – Differences in life styles due to regional background, religion, caste, income etc., and their implication in architectural design of the housing unit.

1. Sociological aspects in the history of the evolution of housing /shelter forms .Sociological problems of interaction , isolation /privacy, accessibility,

conflict, alienation- related to the planning and design of different building s with reference to the people of the different Age groups Socio-Spatial problems-Migrants – slums high density ,high rise living, power structure in society.

### 06.4.7.6: STRUCTURES SEMINAR

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

The following topics will be introduced to students in the classroom, later on they have to choose one topic each work on it and present a Seminar.

#### **Introduction to Standard Software packages for estimating Structural Analysis and Design.**

1. Introduction to Limit state method and practicing design of structural elements slabs, beams, columns and foundations.
2. Industrial Structures in Steel.
3. Multi Storeyed / Tall Structures / Tower.
4. Large Span Construction-flat slabs-shell structures, folded plates, portal frames space frame & trusses; tensile structures.
5. Pre fab construction & Pre-engineered building.
6. Earth Quake resistant design.
7. New Material Construction.
8. Cold form sections, FRR.

Guest lectures are arranged for the latest topics.

A report must be submitted , containing all the topics

Before the practical Viva-voce Examination.

**Viva Voce:** Student should field book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner

#### **Reference:**

1. Shell Structures-Rama Swamy.
2. Prestressed Concrete-Krishnam Raju.
3. Great Engineers-Derek Walker
4. Multi-Storey Buildings in steel-F.Hart, W.Henn, H.Sontag
5. Precast Concrete-Design and Applications-A.M.HASS.
6. Development in Structural form-Rowland Mainstone

7. **Structural Concepts & Systems for Architects-TY Lin, Sidney, D.Stotesbury**
8. **Principles of Space Structures-N.Subramaniam.**
9. **Reinforced concrete- in Architecture-Aly Ahmad Raafat.**
10. **How Buildings Work-Edward**

**06.4.7.7: ELECTIVE-I**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		4	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

**1. THEORY OF INTERIOR AND FURNITURE DESIGN**

**Introduction to Basic Concepts:**

Principles and elements of Interior Design. Interior design process. Rules of themes for space planning and furniture arrangement. Colour Theory and Application in Interior Design colour schemes. The effects of lighting. Concept of art in interior design. Perception and visual phenomena that affect the make up of interiors. Introduction to environmental and behavioral aspects-Anthropometry, ergonomics, proxemics, privacy etc.

Interiors through the Ages:

Interiors as a resultant of Forces of Society, Culture, Climate and technology. Major styles in interiors and relation to various art movements: Greco-Roman, early Christian and Romanesque, Baroque & Rococco. Selected examples of American, British, Chinese and Japanese Interiors. The Industrial Revolution and its influence on Interior Design. Contemporary dictions in interiors with particular reference to India.

Furniture in interiors:

Furniture Categories: Seating, tables & desks, showcases, storage, shopping windows, modular furniture systems, moulded furniture upholstery. Built-in Furniture-Seating, shelves, closets, planters, dividers etc. Brief account of the evolution of furniture.

**References:**

1. **Interior Design and Beyond (Art. Science Industry)-Mary V. Knarkstedt.**
2. **Illustrated History of Interior Decoration-Mario Praz.**
3. **Interior Design-An introduction to architectural Interiors-Friedman, Ple, Wilson**
4. **Interior Architecture-John Kurtich and Garret Eatkin.**
5. **The Challenge of Interior Design-Kleeman**
6. **Interior Design of the 20<sup>th</sup> Century-Anne massery.**

**2. BUILDING CONSTRUCTIONN MANAGEMENT:1**

Introduction to Numerical Techniques:

Linear programming, sensitivity analysis Transportation problems, Inventory control cost benefit analysis, Input-Output analysis, Queuing theory, Simulation, sequencing problem.

Management Techniques:

Role of construction manager, Organization, responsibility & authority, functions in the management process.

Project Management Techniques, Planning, Project planning & control, levels of details & time scale Resource scheduling, smoothing & leveling, project execution, monitoring & progress reporting.

Graphical Representation Histograms, Bar charts

Introduction to PERT/CPM/PNET Time scheduling – construction of networks computation of scale time & float.

Introduction to construction equipment, performance, characteristics of equipment used in the earth moving plants, pile driving, high rise structures, prefabricated & large construction, concrete placing, material handling, mechanical and electrical equipment.

Building Services & Construction Technology:

Advanced and automated Technology in building services, advanced construction technologies.

Introduction to IT in construction industry-software packages.

**References:**

- 1.**Project management through network technologies**  
**M. Thyagarajah**
2. **Construction Project Management Planning, Scheduling & Controlling - K. Chitkara – Tata McGrawhill**

### 3.ARCHITECTURAL CONSERVATION-I

History and theory of conservation

Conservation, concepts, history, principles and methods, development of conservation in Europe. Adaptation and introduction of change in old areas, adaptive reuse of buildings.

Conservation scene in India, Recent works done by the agencies in India: International, National & local, International charters ITC, UNESCO etc., pertaining to area conservation and historic cities.

Emergence of conservation as a subject, brief overview of the Second World War in Europe. Development of the subject. The scope of the profession. Basic principles of conservation.

Approaches to conservation. Case studies from countries in India and abroad. Pioneers of conservation. Definitions and terminology, continuity, change Transformation, Historicity, Values, Authenticity, Preservation, Restoration, and Conservation.

Concept of integrated conservation and its link with development planning and environmental design.

Broad concepts of terms such as Reuse, Rehabilitation, Revitalization, Regeneration, Upgradation, Redevelopment of historic areas and cities. Concept of integrated conservation, related problems, Issues and solutions.

Pilot projects in Britain during the 1960's and later. Comprehensive scope of Architectural conservation, Lessons for Indian situation.

Legislation and International charters pertaining to conservation of area (urban and rural) conservation, world heritage sites.

**References:**

1. Conservation of Historic Buildings Feilden.M
2. Encyclopedia of Archeology Picard Gilbert, Charles.
3. Conservation of cultural property in India A.S Bizht, I.K Bhatnagar

### FOURTH YEAR, 2nd SEMESTER

#### 06.4.8.1: PRACTICAL TRAINING

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	0		25	Internals	
Studio	0	Externals		100	
Total	0	Total		200	

Every student must work in an Architect's Office a full-time trainee for a period of 16 calendar weeks (excluding Viva-voce) from the date of commencement of training. The Chief Architect in the firm should be registered with the Council of Architecture and have a minimum of five years of practical/professional experience after her/his graduation. The student should involve herself/himself in various aspects of work in an office like working drawings, presentation drawings, quantity estimating, site supervision, municipal drawings, etc. Detailed instructions regarding the training will be issued at the end of the Ninth Semester, regarding the frequency of reporting to the department, etc., which the student must strictly follow.

After completion of training, every student will have to submit a detailed report with a set of drawings on at least two projects on which she/he has worked during the twenty calendar weeks of the practical training period. A jury will evaluate this report at a viva-voce. After submission of the report the department at its convenience will arrange for the conduct of the viva-voce examination.

**Viva Voce:** Student should submit the drawings done in the respective office along with a report. They should attend a practical Exam and Viva voce conducted by both an external and an internal examiner.



## FIFTH YEAR, 1<sup>st</sup> SEMESTER

### 06.5.9.1: ARCHITECTURAL DESIGN-VI

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		9	Internals	
Studio	7	Externals		100	
Total	9	Total		200	

#### Course Overview:

This Course will be dealing with the design of large scale, multistory, complex projects and aims to develop skills for a comprehensive design approach in the areas of urban design, housing design and Campus design.

#### Course Content:

- b. Urban Design: Some of the issues to be addressed for the design project pertaining to Urban Design include:
  - Issues of urban structure, urban space and form.
  - Issues of conservation.
  - Issues in zoning, land use, density, development control.
  - Issues of building in context, urban infill.
  - Integration of diverse functional needs, access systems, parking, services etc.
- c. Housing Design: Some of the issues to be addressed for the design project pertaining to Housing design include:
  - Urban density, land use, ground coverage, development controls.
  - Urban systems, services and their integration with the project.
  - User requirements (derived from surveys)
  - Issues of hierarchy, identity, public, private, scale of space.
  - Integration of community institutions etc.
  - Detailing for the disable and the elderly.
- d. Campus Design: Some of the issues to be addressed for the design project pertaining to Campus design include:
  - Issue of Master Plan preparation: academic, administrative, staff housing, student hostels etc.

#### Phase – wise development

- Environmental considerations.
- Safe and Comfortable vehicular and pedestrian movement.
- Issues of character and landscaping.
- Scope for expansion for future developments.
- Details pertaining to the disabled.

Students would need to undertake one of the design subjects for the studio exercise.

Students may be required to develop a brief, translate it into requirements and realize it, in which the student will take approval of the project brief. The evaluation shall be through periodic internal reviews. The final submission will also include a brief report of about 1000 words. Explaining the concept and design proposals along with the main portfolio. It will also include a model.

**Viva Voce:** Student should submit their drawings and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner

#### References:

1. **Campus Architecture.**
2. **Timesavers standard for Housing and Residential development.**
3. **Image of the city-Kevin Lynch.**
4. **Pattern language- Christopher Alexander.**
5. **Defensible space-Oscar Newman.**

### 06.5.9.2: WORKING DETAILS

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		5	Internals	
Studio	3	Externals		50	
Total	5	Total		100	

**Course Overview:** The course is intended to improve the student's ability of detailing by focusing on design and visual aspects and will be oriented towards the development of architectural design after the preliminary/schematic stage.

**Course Content:** Based on the design portfolio of the previous semester, students will have to under take in depth design development for various space/rooms, considering various functional and visual aspects. Every design should specifically come up with

minute detailing for architecture elements such as walls, ceiling, floors, columns, windows, doors, staircases, storage, balconies, shading devices, parapets, railing etc, good details to be studied from literature and site visits. Details to be explored through sketches and drawing. Preparation of details to large scale showing materials used and their treatment.

The final portfolio must reflect the students' skill in detailing a project in a professional manner.

**References:**

1. Architects working details Lance Wright & Dacia Boyne.
2. Contemporary Details Nonie Nirdwand.

**06.5.9.3: ADVANCED SERVICES**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		100	
Total	4	Total		200	

- **Lifts:** Working methods as per NBC and industry standards.
  - Capacity
  - Parts of lift and location of them in the building
  - Types of lifts, passenger, capsule, hospital, goods
  - Introduction to escalators.
- General working following of specific services and provision to be made in building:
  - Telephones and EPABX
  - Security system like burglar alarm services and CCTV's
  - Fire fighting, portable fire fighting equipment and build in wet riser system, sprinkle system for fire fighting
  - Cooking gas distinction for bulk cooking application and houses as per NBC.
  - Elevated flooring for computer application

- Swimming pools: general layout, tank, paorio, finish, filtration plant and water circulation
- **Alternate energy sources of buildings.**
  - Wind energy systems
  - Photo voltaic cells
  - Bio-mass
- **Waste disposal**
  - Industry – types of wastes, solids, liquid, gas type of disposal facilities
  - Hospital – types of water generation, precaution and disposal system
- **Hotel service**
  - Laundry service
  - Kitchens

**References:**

1. Heating and air conditioning of buildings – Oscar Fabes and others
2. Water and energy resources – Satish Tiwari
3. Refrigeration and air conditioning – Manohar Prasad

**06.5.9.4: SEMINAR – II**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		NIL	
Total	4	Total		100	

1. CRITICISM: Need and role of a good critic

Different types of criticism according to Wayne Attoe – Normative, Interpretive, Descriptive.

2. BOOK REVIEW: every student is expected to individually present a comprehensive review of a book allotted to him/ her by the faculty
- ARCHITECTURAL APPRECIATION: through studies of the work of different architects through observation, interview and research.

A group consisting of two or three students would select a building and present a seminar on the understanding of the concepts of space, physical form, structure symbolism etc.

3. EXPERT LECTURES: due to changes in social, economic and technological variables, a number of areas of interest keep emerging from time to time in the field of architecture. To equip students with some knowledge in such areas of interest, lectures may be arranged based on the expertise available in the field.

**REFERENCES**

1. **Modern architecture: a critical history – Kenneth Frampton**
2. **Complexity and contradiction in architecture – Robert Venturi**
3. **Space, time and architecture – the growth of a new tradition – Sigfred Giedion.**

**06.5.9.5: DESIGN WORKSHOP-II**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		Internals	100	
Studio	0	Externals	0		
Total	4	Total	100		
		6			

This course is designed to introduce and expose students to those special topics/themes, which require interaction with an expert in a focused way.

The main objective of this course is to enhance learning through a combination of lectures, demonstration and interactive practical exercise sessions.

The choice of the topic for the workshop will depend on the resource persons available.

Necessary theory background on the subject will be given to the students in the beginning. The students are required to involve themselves on a design focused on a specific theme for duration of one week to ten days. The students will produce outputs in the format as decided by the resource persons conducting the workshop; for assessment.

Suggested topics:

- Climate Responsive Architecture
- Alternative Technologies
- Furniture Design
- Intelligent Architecture
- Disaster Resistant Architecture

Viva Voce: **Student should field book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner**

**06.5.9.6: ELECTIVE – II**

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	2		4	Internals	
Studio	3	Externals		100	
Total	5	Total		200	

**1.COMPUTER APPLICATIONS IN ARCHITECTURE**

1. Computer as a drafting tool: Productivity tools in CAD, organization of layers for working drawings, use of blocks and symboles\_hatch patterns. Dimensioning systems Extracting of areas from drawings, concept of paper space plotting the drawings.
2. Computer as a designtool: Repetition of forms\_mirroring, coping, and array etc.\_calculation of areas, volumes.
  - \_ Computer as visualization tool: 3D modeling, rendering, and animation\_for basic building forms of block models.

• **Customizing of CAD Software:**

Creating and using templates, blocks, symbols and using them in architectural drawings.

- Managements of large drawing files.
- Working in a network environment-Security systems-converting drawing files into Internet compatible files.

• **Allied applications:**

- Use of spreadsheet and for various architectural calculations-estimation, area calculations, project reports, scenarios, and accent etc-preparations of templates for regular repetitive functions.
- Working with word-processing software creating and using templates for regular Office Communication-letters, reports documents etc.
- Database management software creating and using database for materials, workers, drawings, clients etc.

- **Presentation Drawings:**

Preparation of Presentations for large gatherings, corporate clients-using CAD drawings, pictures, 3D images, text etc.

**Reference:**

1. **Engineering drawing with Auto CAD 2000-T. Teyapooan**
2. **Inside Auto CAD-daniel Rather and Habert rice.**
3. **Marter in Auto CAD2000-George omura.**
4. **Windows 98 one-step at a time-BRIAN Underdahl.**
5. **Virtual Architecture-Giulian Zampi, Conway Lloyd Morgan.**

## **2.HOUSING**

Review of different forms of housing globally-particularly with reference to the third world countries.

Review of housing standards and norms. Brief acquaintance with some strategies such as upgrading existing shelter, stimulating private-sector production, developing building materials and alternative technologies, improving architectural design, protecting inner city renters land sharing, resettlement etc. case studies of public and private sector housing.

Review of rural housing schemes and the use of indigenous building materials.

Infrastructure Layout: Layout in housing areas design of housing layout for different income groups.

**References:**

1. **Slums and Urbanisation by A.R.Desai & S. Devadas Pillai, publishers-Popular Prakashan Private Limited.**
2. **Reading Material on Housing-ITPI.**
3. **Architecture of self-help communities.**

## **3. URBAN DESIGN**

Discussion on architecture/Urban design/town. Planning Interface  
Urban Morphology and Elements of Urban Design.

Physical determinants during ancient, medieval and modern periods in India and abroad.

Forms of classical cities, medieval towns, neoclassic cities, and industrial towns.

Characteristics of settlements built by Muslim and Hindu rulers.

Changing structure of urban scope due to variation in life style through ages: sectors, blocks, streets, squares, houses and gardens.

Colonial inheritance, growth of port towns as primate cities, civic lines, cantonments, railways, resort towns and Design of New Delhi.

Modern movements in city design such as 'city-beautiful, Garden city utopian and model towns in the west.

Role of planning agencies such as Development Authorities, Urban Arts Commission in the design of cities.

Influence of city development policies namely Master plans, Zoning regulations, Transportation, and Resource allocation on urban design.

Built form and space requirements in different: Land-uses-Residential, offices, commercial, industrial and recreational activities.

Nature of Urban design projects in private and public developments.

Elements of utility services in the cityscape.

Patterns of subdivision and land-development. Role of private real-estate activity in urbanscape.

Urban conservation and its role in urban design. Past and present trends in conservation, techniques of conservation and role of architectural control in conservation of historical styles.

**References:**

1. **City in History, Its origin transformation & its prospectus-Mimford, Lewis.**
2. **Design of Cities-Bacon, Edmund.**
3. **History of the City-Benevolo, Leonard.**
4. **Urban Space-Rob Krier**
5. **Urban Design, The Architecture of Towns, & Cities-Spreiregn, Paul.**
6. **Urban Design Street & Square-Moughtin, Cliff**
7. **Urban Design Ornament & Deocotation-Moughtin, Cliff**
8. **Urban Design Green Dimensions-Moughtin, Cliff.**



#### 4. DISASTER RESISTANT BUILDINGS

- Types of disasters; Man-made: disasters, hazards caused by world climate change.
- Characteristics of particular hazards and disasters: earthquakes, cyclones, floods, environmental accidents, and other disasters.
- Assessment for different disaster types:
- Case Studies: Projects implemented general description of projects carried out in India following natural disasters. Disaster resistant buildings & measures. Recent developments. Case studies in the rest of the World- Bangladesh, Elsalrador,

**References:**

1. **Building Configuration and Seismic Design-Christopher Arhold & others.**
2. **Structural failures in Residential Buildings-Frich Schild & Others.**
3. **Hanbook of Planning security oPlanning & Design-Peter S. Hopf.**

#### 5.PREFABRICATED CONSTRUCTION

Introduction to prefabricated buildings. Advantages over conventional construction; offsite and onsite conditions for prefabricated constructions. Understanding of the functional, financial structural, sociological and aesthetic implications of using prefabricated system for buildings.

Various types of prefabricated elements and materials. Modular co-ordinations.

Tolerances and finishes. Joints and connections in prefabricated constructions.

Manufacture, storage and transpiration of precast elements. Equipment for handling, assembly of precast elements for prefabricated buildings.

Study of known examples of prefabricated industrial housing in India and rest of the world with focus on various forms of solutions.

**References:**

1. **Low cost housing for developing Countries-Proceedings of the international Conferences.**

2. **Funicular shell roof, Design and Construction of Concrete Steel roof- Ramaswamy G.S.**
3. **Guide for Requirements of Low Income Housing-IS\_8888 (Indian standards Institution).**

#### 06.5.9.6: STRUCTURES THESIS

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		6	Internals	
Studio	0	Externals		50	
Total	4	Total		100	

Each group of minimum of 3 students in each is required to detail out a structural design projects mentioned below independently by taking framed structure of a small residence.

1. Structural design project in R.C.C including design calculations and structural drawing complete.
2. Structural design project in steel including design calculation complete.

**Viva Voce:** Student should submit a thesis book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner.

## FIFTH YEAR, 2<sup>nd</sup> SEMESTER

### 06.5.10.1: DESIGN THESIS

Instruction Periods per Week		credits	marks		Duration of Exam
Lectures	30		30	Internals	
Studio	0	Externals		100	
Total	30	Total		200	

Each student is expected to prepare a design thesis based on the preliminary work under taken in the Architectural Design sixth Studio under a department approved guide/adviser.

The thesis should be a design-oriented project approved by the department. The thesis should reflect the knowledge gained from the entire course under taken by the student in all the previous semesters. The topic should be preferably related to the students' elective stream.

The particulars of schedule, content, presentation, formal, etc., as decided by the department time to time, shall be strictly followed.

At the end of the semester, each student is expected to submit all original drawings prepared as per the departments specifications, three copies of the report in the specified format and a modern should be submitted to the department after obtaining the approval of the respective guide/adviser.

The department shall schedule the final viva\_voce, at its convenience, only after the thesis submission by a student.

**Viva Voce: Student should submit a thesis book and they should attend a practical Exam and Viva voce conducted by both an external and an internal examiner**

### 06.5.9.2: PROFESSIONAL PRACTICE AND LEGISLATION

Instruction Periods per Week		Credits	Marks		Duration of Exam
Lectures	4		3	Internals	
Studio	0	Externals		100	
Total	4	Total		200	

Role of architect in society; architectural profession as compared to others professions; difference between profession and Mode/business; architect's registration, COA, and other organisations related to architectural profession.

Architects approach to works; ways of getting works; types of works, works partly executed by other architect; various precautions to be taken before taking up the work; conditions of engagement between the architect and client; commencement of work.

Architect's duties; drawing to be prepared; architects relation with other parties connected with works such as client, contractor, quantity, subcontractors, consultants, municipal and public authorities.

Code professional conduct; COA rules; Scale of charges; units and mode of measurements clerk of work and his duties; inspection of work during construction; certificate of payment to contractor; skills of quantities; schedule of rates, tenders; public, limited and negotiated tender documents and allied formalities.

Contracts; types of contracts such as item rate, labour, lumpsum, cost plus percentage, demolition etc.

General principles of Indian contract Act; Building contracts generally, conditions and forms of contract, study of standard contract of the Indian Institute of Architects.

Administration of contract. Principle of Arbitration, Indian Arbitration act 1940, powers and duties of arbitrators, revoking authority; umpire, award.

Easement: definition; various types of easements; document and servant owners essential conditions for enjoyment of easement; fire insurance's definition, cover note; insurance for new work and additions; insurable value of property, claim for damage due to fire.

Preliminary knowledge of transfer of property Act; registration, stamp duty; under registration & govt. Power. Incometax, wealth land acquisition Acts; general information about land

Acquisition procedures.

Accidents during progress of work and after completion, damage to persons and properties affected; scope of torts Act and workmen's compensation Act with regards to the affected persons and properties;

Consumer protection Act and related acts on Architects.

Practice Architects Act 1972; Professional Practice Regulation and architectural education regulations under the Architects Act.

Types of officers for architectural practice; staff structure; filing of records; correspondence and drawings maintains of accounts; presentations in meetings, recording minutes of meeting. A small report to be prepared by each student after visiting an architect's office.

Role of consultants and coordination between different consultations on a big project. Study building by laws to unable to design and prepare drawings for submission to concerned bodies.

National building code, Fire prevention and safety measures.

**REFERENCES:**

1. **Theory and Practice of Valuation\_Roshan Namavati.**
2. **Professional Practice\_Dr.Roshan H.Namavati.**
3. **Principles and Practice of valuation\_Mr.D.N.Banerjee.**
4. **Land Law,By Patrick J.Dalton.**
5. **Professional Practice\_Roshan Namavathi.**
6. **Hand book on Professional Practice\_COA Publication.**
7. **National Building Code of India\_ISI(1983).**