

IV - SEM

AA-430 ARCHITECTURAL DESIGN III

	L	T	P
Hours/Week	2	-	7

1. Design of a complex three bedroom house/ small public building such as nursery school, community centre, public library, restaurant, dispensary etc. in a specific climatic zone on multiple floors, split levels opening on to terraces.
  - 1.1. Study report of and existing building
    - 1.1.1 Site study,
    - 1.1.2 Analysis of area requirement of different spaces and activities,
    - 1.1.3 Circulation
  - 1.2. Concept Plan
  - 1.3. Study of Climatic data of the city in which building is to be designed and its application in design
  - 1.4. Presentation drawings:
    - 1.4.1 Floor plans,
    - 1.4.2 Site plan,
    - 1.4.3 Elevations
    - 1.4.4 Sections
    - 1.4.5 Views
    - 1.4.6 Block Model
2. Requirements of parking in a building. Spaces required for parking of different vehicles.
  - 2.1. Students should take measurements of different types of vehicles, study their turning radius and work out the parking requirements for different vehicles- cars, trucks, cycles, scooters, bus etc.
3. Two time problem on small public building/house design.

*School*

# AA- 431 BUILDING CONSTRUCTION III

L T P

Hours/ Weeks 2 - 6

	Theory	Drawing work
1.	<b>Steel doors and windows</b>	
1.1	Using standard BSI steel sections	Drawing casement and sliding doors and windows using different sections Fixing details of Fixtures- aldrops, towerbolt, door closers, handle, grills, locks etc in different types of doors and windows( 2-3 sheets). Drawing of rolling and collapsible shutters.
1.2	Using rolled sections as frames and wooden shutters	
1.3	Basics of Rolling and collapsible shutters. Hinge of different types & their applications	
1.5.	Fly shutters	
2.	<b>Roof covering AC, GI sheets</b>	
	Steel Truss- Single Lean roof, Double Collar Roof. Introduction to Large span structures roof and structural glazing	Drawing of details of roof covering with AC sheets and GI sheets on steel trusses. ( 1 – 2 sheets)
3.	<b>Finishes</b>	
3.1	Plastering and pointing, various types of external finishes, like plain plaster, sand faced plaster, grit wash finish, etc.	Drawing of details showing joints, fixing method of stone with the wall Drawing details showing fixing tiles ( 2 sheet)
3.2	Stone cladding and tiling on walls	
4.	<b>Formwork in wood and steel</b>	
4.1	Definitions of formwork, shuttering and materials used	
5.	<b>Compound wall</b>	Drawing details of compound wall showing name plate and steel gate, its fixing details( 2 sheet)
6.	<b>Toilet Details- various fixtures, wall and floor tiles, mirrors, shelves etc</b>	Drawing details of fixing of fixtures (WC, washbasins, taps, traps, shower curtain, towel rail, hooks, bathroom mirror etc) ( 1 sheet) A report on various sanitary and light fixtures to be presented in portfolio and viva exam.

# AA-432 WORKING DRAWINGS AND DETAILING I

L    T    P  
Hours / Week    1    -    4

Complete set of drawings of a house done by the students in the earlier semester

S. No.	Detail of Drawings	No. of sheets
1	Foundation plan and details including excavation plans	2 Sheet
2	Site Plan	1 Sheet
3	Ground floor plan	1 Sheet
4	All upper floor plans as per design	Drawings as per requirement
5	Terrace floor plan showing rain water drainage and disposal	1 Sheet
6	Elevation- all elevations as required explaining the scheme.	Drawings as per requirement
7	Sections- as many sections as required explaining the scheme.	Drawings as per requirement
8	Doors and windows details	Drawings as per requirement
9	Any other drawing necessary to explain the scheme.	Drawings as per requirement

# AA-433 BUILDING BYE - LAWS AND MUNICIPAL DRAWINGS

L T P

Hours/Week 2 - 1

## 1. Introduction to Building Byelaws

- 1.1 Necessity of framing bye-laws for urban development.
- 1.2 Principles involved in framing bye-laws.
- 1.3 Study of local bye-laws and local zoning plans as applied to buildings and their effects on design of building.

## 2. Study of building bye laws of Delhi and relevant portion of Delhi Master Plan

- 2.1 Study of building bye - laws (I S 1256 provisions and definitions)
- 2.2 Special emphases to be given to minimum sizes of various rooms, kitchens, toilet, courtyards, ventilation shafts, ledges, lofts and balcony projections.
- 2.3 Laws related to fire.

## 3. Preparation of Municipal drawings of the residence designed in third semester using applicable bye laws for submission to corporation.

- 3.1 Preparing plans of different floors to respective scales
- 3.2 Preparing Front, Rear and Side elevations on scale(if plot is 3 side open)
- 3.3 Preparing sections on scale:
  - Section through staircase and mezzanine if any
  - Section through kitchen, toilet and basement if any
- 3.4 Preparing site plan on scale:
  - Site plan showing covered area, open area, service lane, front road, main features of adjoining areas, and setbacks of building as per Master Plan/Bye laws.
  - Part layout plans of surrounding plots in question/ key plan
- 3.5 Preparing Details:
  - Foundation Detail and Section of RCC column if any
  - Schedule of doors and windows
  - Services Plan and Area Chart
- 3.6 Miscellaneous:
  - Address of plot as per scale deed
  - Signature and address of applicant (s)
  - Name, address, registration no. and signature of architect & plumber
  - Scale on which drawing is prepared and north point.
- 3.7 Prints and Submissions:
  - Protocols to be followed in submission of drawings in Delhi
  - Two sets of prints of drawing prepared, One set cloth mounted
  - All sets to be colored as per BBL
  - Folding of prints as per file cover size.
- 3.8 List of documents and forms to be enclosed with the drawings
  - Notice to erect a building and General Specification
  - Attested copy of a receipt for payment of building fees and stacking charges
  - Affidavit and undertaking requirements of building fees and stacking charges required under Act
  - NOC from competent authority regarding land use as per Master/Zonal plan
  - Approval from chief inspector of factories for industrial buildings only
  - Indemnity bond in case of construction of basements
  - Supervision certificate of architect
5. Calculation of permissible covered area and FAR of various sizes of residential commercial and industrial plots calculation of FAR and ground coverage.

- 4.1 Calculating plot areas, covered areas permissible on each floor
- 4.2 calculation of FAR



## AA-434 HISTORY OF ARCHITECTURE II

L T P

Hours / Weeks 3 - -

### 1. Islamic Architecture in India

To be studied under historical, economical, social, political and geographical background, effect of local elements on invading forces in following periods.

- 1.1. Slave dynasty – Khilji, Tuglaq, Lodi & Sayyad Period
- 1.2. Provincial architecture, Area of study - Gujarat, Bijapur, Deccan
- 1.3. Mughal period with emphasis on works of Humayun, Akbar, Jahagir, Shahjahan,

### 2. Medieval architecture in Europe

- 2.1. Gothic Architecture in Europe with reference to English and French churches
- 2.2. Renaissance in Europe – social, economical, political and scientific factors that brought about renaissance and its influence on architecture especially in Italy and England

### 3. Industrial Revolution and its effects on Architecture

- 3.1. Role of iron and steel in 19<sup>th</sup> century – bridges, factories, exhibitions (Crystal Palace and Eiffel Tower)
- 3.2. The new building materials – RCC, wrought iron, cast iron, glass

### 4. Modern Architecture

- 4.1. Concerns of Modern Architecture
- 4.2. Pioneers of Modern Architecture
- 4.3. Study of Architectural philosophies and works of Le Corbusier, F.L. Wright, Mies vander Rohe and Walter Gropius

### 5. Modern architecture in India covering the works of Indian architects

- 5.1. B.V. Doshi, Charles Correa, Lawrie Becker, J.A. Stein
- 5.2. Study of New Delhi and Chandigarh city Planning

### 6. Measure Drawing

- 6.1. Critical analysis of an ancient building with respect to its planning, space, concept, aesthetics, use of materials, constructional technology, climatological aspect etc.

## AA-436 THEORY OF STRUCTURES

	L	T	P
Hours/week	3	-	-

### 1. Resultant of force system and equilibrium

- 1.1. Force: Definition, SI units, types, system of forces, graphical representation by Bow's notation.
- 1.2. Resultant of concurrent forces, law of parallelogram, triangle law of forces, polygonal law of forces, resolution and addition of forces.
- 1.3. Moment of forces: Statement of varignons theorem, resultant of non-concurrent forces, and parallel and non-parallel forces. Problems on resultant of forces system.
- 1.4. Equilibrium: Concepts of equilibrium, equilibrium of two or more forces, conditions of equilibrium, body constraints, type of reaction provided by each constraint. Problems on equilibrium.

### 2. Centre of gravity

- 2.1. Centre of gravity by geometrical consideration for rectangle, triangle, and semicircle.
- 2.2. Centre of gravity by the method of moments of areas of composite and regular figures.

### 3. Moment of Inertia

- 3.1. Meaning of the term, second moment of area, section modulus, and radius of gyration of a section.
- 3.2. Theorem of parallel axis and perpendicular axis (statement only without proof).
- 3.3. Second moment of regular figures - rectangle, triangle, circle and annular sections (formulae only)
- 3.4. Moment of inertia for I and T section.

### 4. Shear Force and Bending Moments

- 4.1. Definition and concepts of SF and BM calculations of reactions.
- 4.2. SF and BM diagrams for simply supported, overhanging, cantilever beams subjected to concentrated or uniformly distributed loads on entire or partial span.
- 4.3. Calculation of position and magnitude of maximum shear force and bending moment, point of contra flexure.

### 5. Simple Stress and Strain

- 5.1. Concepts and definitions, units types of stresses, axial stresses in bars, strain.
- 5.2. Hook's law, tensile test on mild steel, working stress and factor of safety,
- 5.3. Temperature stresses in simple bars, Poisson's Ratio, Young's, rigidity and Bulk modulus, problems on these.

### 6. Theory of Simple bending

- 6.1. Bending stresses, neutral axis.
- 6.2. Symmetrical and unsymmetrical sections.
- 6.3. Assumptions in theory of bending.
- 6.4. Flexure formulae and their application (no derivation).

## AA- 435 SURVEYING II

	L	T	P
Hours / Weeks 2	-	-	1

### 1. Contouring

- 1.1. Explanation of terms in contouring.
- 1.2. Characteristics of contouring.
- 1.3. Uses of contours.
- 1.4. Method of contouring and their plotting.
- 1.5. Interpolation of contours.

### 2. Photo-grammetry and Remote Sensing

- 2.1. Introduction
- 2.2. Scale of photograph
- 2.3. Tilt and height displacement
- 2.4. Stereoscopic vision and Stereoscopes
- 2.5. Techniques of photo interpretation
- 2.6. Principles of Remote Sensing

### 3. Introduction to GPS and GIS

- 3.1. Global Positioning System (GPS)
- 3.2. Introduction, Principles and application of GPS in different field of Surveying
- 3.3. Geographic Information System (GIS)
- 3.4. Introduction, Geographical concepts and terminology
- 3.5. Application of GIS

## PRACTICAL EXERCISES

### CONTOURING

#### Exercise -1

- i. Preparing a contour plan by radial line method by taking the students to the appropriate site.

#### Exercise -2

- i. Preparing a contour plan by method of squares of an appropriate site.



AA - 437 COMPUTER GRAPHICS II

	L	T	P
Hours / Weeks -	-	-	4

1. **Advanced Object Types**
  - 1.1. Drawing Arcs
  - 1.2. Drawing Polylines
  - 1.3. Editing Polylines
  - 1.4. Drawing Polygons
  - 1.5. Drawing Ellipses
2. **Getting Information from Drawing**
  - 2.1. Working with Object Properties
  - 2.2. Measuring Objects
3. **Inserting Blocks**
  - 3.1. What are Blocks?
  - 3.2. Inserting Blocks
  - 3.3. Working with Dynamic Blocks
  - 3.4. Inserting Blocks Using DesignCenter
4. **Setting Up a Layout**
  - 4.1. Printing Concepts
  - 4.2. Working in Layouts
  - 4.3. Copying Layouts
  - 4.4. Creating Viewports
  - 4.5. Guidelines for Layouts
5. **Printing**
  - 5.1. Printing Layouts
  - 5.2. Printing from the Model Tab
6. **Text**
  - 6.1. Working with Annotations
  - 6.2. Adding Text in a Drawing
  - 6.3. Modifying Multiline Text
  - 6.4. Formatting Multiline Text
7. **Hatching**
  - 7.1. Hatching
8. **Adding Dimensions**
  - 8.1. Dimensioning Concepts
  - 8.2. Adding Linear Dimensions
  - 8.3. Adding Radial and Angular Dimensions
  - 8.4. Editing Dimensions
  - 8.5. Adding Notes to Drawing
9. **Working with Blocks**
  - 9.1. Creating Blocks
  - 9.2. Editing Blocks
  - 9.3. Removing Unused Elements
  - 9.4. Adding Blocks to Tool Palettes
  - 9.5. Modifying Tool Properties in Tool Palettes
10. **Creating Templates**
  - 10.1. Why Use Templates
  - 10.2. Controlling Units Display
  - 10.3. Creating New Layers
  - 10.4. Adding Standard Layouts to Templates
  - 10.5. Saving Templates

## **11. Annotation Styles**

- 11.1. Creating Text Styles
- 11.2. Creating Dimension Styles
- 11.3. Creating Multileader Styles

## **12. Advanced Layouts**

- 12.1. Quick View Layouts
- 12.2. Creating and Using Named Views
- 12.3. Creating Additional Viewports
- 12.4. Layer Overrides In Viewports
- 12.5. Additional Annotative Scale Features

## **13. Miscellaneous**

- 13.1. Use of x-refs in the drawings.
- 13.2. Adjustment of building on the site

## **14. Exercise**

14.1 Preparation of Municipal drawings of a residential building in 2D, showing site plan, key plan, all floor plans, sections and elevations including calculation of total covered area, F.A.R. and schedule of openings.

14.2 Printing of the above exercise on available printer.