V - SEM

AA-530 ARCHITECTURAL DESIGN IV

	L	T	P
Hours / Week	2	-	9

1. **Design of a medium-sized public building on two or more floors such as nursing home, cultural centre, hostel, club. Motel, etc.**

   1.1. Study report of an existing building

   1.2. Study of basic site planning parameters including

   Off-Site Consideration
   - Access
   - Surroundings
   - Transport routes

   On- Site Consideration
   - Entry / exit points
   - Topography
   - Positive and negative aspects
   - Point of interest
   - Existing structures
   - Existing vegetation etc.

   Analysis of area requirement of different spaces and activities
   - Circulation
   - Critical Analysis

   1.3. Presentation drawing:
   - Preparation of the concept note
   - Site analysis
   - Floor plans,
   - Site plan along with terrace plan of the building
   - Elevations,
   - Sections.
   - Views.

   1.4. Model

2. **Study report on parking:**
   2.1. Size and turning radius of various vehicles.
   2.2. Working of parking area for different angles.

3. **Two time problem on medium sized public building design from above mentioned topics.**

AA – 531 BUILDING CONSTRUCTION IV

	L	T	P
Hours / Weeks	2	-	6

	Theory	Drawing work
1.	**Doors and Windows**	
1.1	Different types of aluminium sections and their finishes. Advantages and Disadvantages of different sections	Drawings of aluminium door and window showing fixing, beading, hardware, use of floor spring. (2 sheets). Drawing of sliding, sliding folding and pivoted doors, revolving doors. Drawing of casement and sliding windows fixing details of window grills.(3 sheets)
1.2	Anodizing of aluminium sections	
1.3.	Beading in conjunction with aluminium	
2.	**Interiors of Buildings**	
2.1	False ceilings and partitions	Drawing and detailing of false ceiling of plywood, POP and readymade aluminium sections. (2 sheets). Fixing details of light fixtures, AC duct, fire alarm and smoke detectors in false ceiling(1 sheet)
2.2	Different counters such as Bank counters showroom display counter, reception counter, and computer work station per usage.	Drawings of counters in different materials- stone tile, blockboard, wood, cement concrete with cladding, glass etc(3 sheets).
2.3	Panelling	Drawing of panelling details (1 sheet)
2.4	Wooden Partitions	High level and low level partitions with side plywood, partly glazed partition, sound proof partition, room dividers (2 sheet).
3.	**3.1 Sideboards** **3.2 Wardrobes**	Drawing of sideboards and wardrobes including • Drawers on slide channel • Drawer without slide channel • Fixing detail of fixtures like locks, handles, cloth rails, hooks etc,(2 sheets)
4.	**Kitchen details**	Full cross section of marble counter with cabinets below and above.(1 sheet)
5.	**Sequence of construction**	Sequence of different works in construction i.e. foundation, DPC, etc.
6.	**Expansion joints.**	

AA – 532 LANDSCAPING

	L	T	P
Hours / week	2	-	-

1. **Introduction to Landscape Architecture**

2. **Elements and Principle of landscape Design**
   Line, form, texture, colour, light, unity, rhythm, harmony, balance, contrast, emphasis, proportion etc

3. **Landscape Design Elements**
   - 3.1 **Soft Landscaping –**
     Plant and tree types, Using plants for screening and windbreaks, Using plants for their aesthetic appeal, Trees, Hardy shrubs, Herbaceous perennials, Grasses, Climbers; Planting for harsh environments, Planting for Climatic control, Common trees that grow in Delhi's climate- their height and foliage and their suitability for different uses.
   - 3.2 **Hard Landscaping-**
     Different types of hard landscapes, different types of paving, steps, boundary walls, water as a landscape feature etc

4. **Landscape Design with respect to function and aesthetics:**

   Landscape and usage of outdoor functional spaces in major building type like institutions, office buildings, residences, etc.

5. **Street Furniture-** definition, types, utilities and application
6. **Introduction to the gardens around the world.**
   - 6.1 Japanese
   - 6.2 Mughal
   - 6.3 Modern
   - 6.4 European

7. **Outdoor lighting**
   - 7.1 Introduction to outdoor lighting,
   - 7.2 Common fixtures and fittings.
   - 7.3 Water lighting

8. **Introduction to sustainable landscaping-** need, definition, explanation of - green roofs, green walls, xeriscaping, energy efficient landscapes, permeable paving, use of renewable energy in landscaping, native plant selection, enhancing natural habitats for wildlife etc

9. **Students shall prepare study report of a small landscaping project as part of assignment**

AA-533 BUILDING SERVICES

	L	T	P
Hours/week	3	-	1

1. **Introduction**
   - 1.1 General Introduction to building services specially in reference to residences

2. **Sanitation and House Drainage**
   - 2.1 Glossary of drainage terms such as Storm overflow, Self Cleansing Velocity etc.
   - 2.2 Systems of drainage - Combined and separate systems
   - 2.3 Trap-sizes, types and functions
   - 2.4 Inspection chambers- sizes, spacing & their construction (sketches only)
   - 2.5 Ventilation of house drainage
   - 2.6 Intercepting traps, gully traps and their functions and sizes
   - 2.7 House drainage systems such as One and two pipe systems
   - 2.8 Preparing layout plan for disposal of sewerage in domestic buildings up to the connection with the public sewer

3 **Plumbing and Internal Fixtures**
   - 3.1 Joints for various types of pipes.
   - 3.2 Sewage Disposal - Septic tanks, Aqua Privy and soak pits

4 **Domestic water supply**
   - 4.1 Consumption or demand of water for domestic purposes.
   - 4.2 Leakage and wastage of water and its preventive measures.
   - 4.3 Different methods of water distribution, gravity pressure and dual methods.
   - 4.4 Different Water Layout systems such as tree, grid iron, radial etc.
   - 4.5 Laying and jointing cast iron water mains; different types of joints.
   - 4.6 Service connection for mains.
   - 4.7 Preparing water supply layout for domestic building

5 **Introduction to rain water harvesting/ water table recharging-**
   - 5.1 Introduction, needs and issues in water harvesting;
   - 5.2 basics of hydrology, water harvesting, conservation and utilization;
   - 5.3 some methods of recharging and conserving water

6 **Electrical**
   - 6.1 Principles of electrical layout, selection and placement of fittings
   - 6.2 Quality of light - mercury lamps, incandescent lamps, fluorescent tubes and CFLs
   - 6.3 Thumb rule for calculating illumination level
   - 6.4 Various systems of wiring and their suitability
   - 6.5 Lifts
   - 6.6 Precaution to avoid electrical accidents
   - 6.7 Fire caused by electricity and the fighting arrangements
   - 6.8 Preparing electric layout plan for domestic building

7 **Introduction to Air Conditioning and ventilation**
   - 7.1 Principles of Air conditioning
   - 7.2 Different system of ducting and distribution
   - 7.3 Window units (Package units)
   - 7.4 Split Air conditioners
   - 7.5 Introduction to Air Conditioning Layout of small residences in plan

8 **Introduction to Energy efficient heating, cooling & ventilation, their design implications**
   - 8.1 Solar air conditioning
   - 8.2 Solar water heating
   - 8.3 Solar lighting etc.

AA- 534 STRUCTURAL DESIGN

	L	T	P
Hours/week	3	2	-

Note: IS 800, IS: 456 and steel tables are allowed in the examination

1. **RCC Structural elements.**
   - 1.1 **Reinforced concrete materials and properties, grades of concrete,**
   - 1.2 **Comparison between working stress and limit state method.**
   - 1.3 **Reinforcing Materials**
     - 1.3.1 Suitability of steel as a reinforcing material
     - 1.3.2 Different types of reinforcing materials including cold twisted deformed bars
     - 1.3.3 Loads as per IS- 875
   - 1.4 **Theory of R.C.C beams**
     - 1.4.1 Assumption in theory of simple bending in RCC beams
     - 1.4.2 Flexural strength of reinforced concrete beams
     - 1.4.3 Flexural members' Neutral axis, critical neutral axis, balanced, under reinforced, over-reinforced section, lever arms, resisting moment of sections.
     - 1.4.4 Shear in beams
       - Effects of shear stresses, permissible shear stresses
       - Vertical stirrups and inclined bars as reinforcement for shear and diagonal tension as per IS provision
       - Length of embedement and anchorage as per IS code provisions.
   - 1.5 **Singly reinforced beams**
     - 1.5.1 Calculation of moment of resistance of a simply supported beam for given data as load, span and properties of materials used
     - 1.5.2 Design of singly reinforced rectangular simply supported beam as per IS code from the given data as per span and properties of material used; with structural drawings.
     - 1.5.3 Design of cantilever beams and its drawings
     - 1.5.4 Design of lintel with or without sunshade
     - 1.5.5 T-Beam (singly reinforced only), position of neutral axis, depth of T-Beam width of flange, design of T-Beams as per IS- 456. Drawing of T- Beams
   - 1.6 **Slabs**
     - 1.6.1 Design of one way simply supported slab with drawing
     - 1.6.2 Design of two way slab with the help of IS- 456 - Design coefficients for simply supported or continuous with drawings
   - 1.7 **Columns**
     - 1.7.1 Concepts of long and short columns as per IS 456 Provisions. Effective length of columns.
     - 1.7.2 Design of axially loaded long and short columns as per IS provision.
     - 1.7.3 Drawing of reinforcement of columns
     - 1.7.4 Drawing of isolated footing for a column.

2. **Steel Structural elements.**

2.1 Comparison of steel and RCC structure in building.

2.2 Structural steel and steel sections, study of steel tables and reading of data for steel sections, knowledge of IS: 800.

2.3 Structural connections – Types of riveted connections with sketches (Drawing only)

2.4 Welded connections, types of welds, forces in welds, types of welded connections with sketches. (Drawing only)

2.5 Beams: Design of laterally restrained beams with simple Rolled Steel section as per :800 and steel tables

2.6 Design of axially loaded struts.

2.7 Axially-loaded ties.

3. **Introduction to seismic zone considerations on high rise structures.**

4. **Introduction to design implications to disasters.**

AA - 535 FIELD BASED MAJOR PROJECT I

	L	T	P
Hours/week	-	-	2

Objective: To expose students to the real world of building construction and design. Students get valuable practical exposure to the dynamics of implementation of building projects, which can complement and supplement their theoretical knowledge. It also helps in development of observation, analytical and evaluative skills of students. This kind of exposure will be of immense value in enhancing the market value of the students.

Methodology

- The student shall buy a scrap book (10" x 8") of about100 pages
- The student shall identify simple residential building(s) under construction near his/her houses for the purpose of the study.
- The student shall be in constant touch with the faculty/guide, owner of the residence and the contractor working on the site.
- The student shall make regular, ongoing recordings about the following and get them countersigned weekly.
- The students should observe all the stages of construction.
- The students should take information about the building materials and their rates.
- Sketches shall be free hand but to the scale.
- Students should also study the code of practice of Bureau of Indian Standards for varicus topics that they study in the project work to get an understanding of the correct field practice that should be followed on site.

Contents

1. **Sanitary / plumbing layouts**
   - Plumbing layouts at site
   - Sizes/ materials of pipe available in market
   - Pipe joinery and finishing
   - Study and use of fixtures, such as elbows, T junctions, cross junctions, Y junctions Tools & equipments required.
   - Precautions

2. **Electrical layouts**
   - Laying out of cables, electrical fittings during construction
   - When is the cable layout done in the sequence of work
   - Basics of electrical circuitry followed at site
   - What kinds of fixtures / wiring are available in market and their advantages & disadvantages so as to choose among them?
   - Tools & equipments required and precautions to be followed.
   - Material used/ costing of material

3. **Roof terracing**
   - Type of terracing
   - Procedure of terracing
   - Precautions to be followed while laying terracing
   - How is the slope measured and provided during terracing
   - Mix of mortar being used in the construction
   - Different tools used for terracing
   - Different materials used in terracing/ their cost per unit

AA-536 COMPUTER GRAPHICS – III

	L	T	P
Hours/week	-	-	4

OBJECTIVE : To teach students to prepare advanced 2D and 3D drawings, including architectural rendering, shading, perspective drawing etc. To prepare students in making presentation drawings of the architectural projects along with building views.

1. **Google Sketch-Up Basics**
   - 1.1. Basic drawing in 3D – lines, rectangles, circles
   - 1.2. Push-Pull – converting shapes from 2D to 3D
   - 1.3. Selection and Inference
   - 1.4. Move, Copy, Offset & Mirror
   - 1.5. Working with groups/ components
   - 1.6. Getting models from 3D warehouse
   - 1.7. Use of different styles
   - 1.8. Importing CAD drawings
   - 1.9. Introduction to other new softwares

2. **2D Image Import**
   - 2.1. Google Earth images
   - 2.2. Tracing the Image
   - 2.3. Using Push-Pull to Make a Building

3. **Photo Import & 3D Perspective Drawing**
   - 3.1. Photo Import
   - 3.2. Aligning the Image
   - 3.3. Drawing Edges & Faces

4. **Building Orientation and Shading**
   - 4.1. Orienting the drawing to true north
   - 4.2. Lighting model in Google Sketch-Up

5. **Practical Exercises**

   5.1 Preparation of drawing through the use of graphics package such as ACAD. I t is recommended that the student be made to practice on the latest release of graphics package. The following drawings should be made as exercises.

   - Site plan with plants & other details
   - Floor plans
   - Sections
   - Elevations
   - printing of the above exercises on available printer

(ELECTIVE I)

AA-540 MODEL MAKING

	L	T	P
Hours/week	-	-	2

OBJECTIVE: To enable students to make models as 3D visualization tool for designing as well as presentation

1. **Uses of Different Materials:**
   - 1.1 Wood
   - 1.2 Thermocol
   - 1.3 Cork
   - 1.4 Plaster of Paris
   - 1.5 Paper sheets of various kinds
   - 1.6 Mount board
   - 1.7 Balsam wood
   - 1.8 Acrylic sheet

2. **Site presentation**
   - 2.1 Ground surface,
   - 2.2 Human figures,
   - 2.3 Vegetation,
   - 2.4 Vehicles

3. **Detailed Study**
   - 3.1 Jaali details
   - 3.2 Grill details
   - 3.3 Gate details
   - 3.4 Railing details

4. **Preparation of Model**
   - 4.1 Students will prepare a model of one of their projects done earlier.

(ELECTIVE – I)

AA-541 URBANISATION AND TOWN PLANNING

	L	T	P
Hours/week	2	-	-

1 **Introduction to Dimension of Urbanization-** definition and brief explanation of

- 1.1 Causes of urbanisation
- 1.2 Impact of urbanisation
- 1.3 Advantages and disadvantages of urbanisation
- 1.4 Growth of cities and classification of towns and cities as per population
- 1.5 Urban migrants, reason for migration
- 1.6 Urban poor

2 **Town Planning (physical)**

- 2.1 Introduction and need of town planning
- 2.2 Principles of town planning
- 2.3 Density - High and low
- 2.4 Relationship between ground coverage, density and FAR
- 2.5 Low rise high density development and high rise low/high density development
- 2.6 Land use planning
  - Residential area
  - Industrial landuse
  - Semipublic/public places
  - Commercial
  - Roads
  - Parks and playgrounds
  - Vacant land
  - Land use planning and Delhi Master Plan provisions

3 **Relationship between transport, infrastructure and housing**

4 **Town Planning standards for neighbourhood-** need, reasons, special areas

5 **Urban Planning Issues**

- 5.1 Land use patterns- problems and prospects
- 5.2 Urban Poverty- reasons, manifestations, growth of slum, growth of informal sector, underdeveloped labour, pressure on services, effect on education and health, increase in crime etc
- 5.3 Issues in physical infrastructure – Energy, water supply and sanitation
- 5.4 Tranport Planning- issues, relationship between town growth and traffic, low cost transport, need for mass transport systems, importance of pedestrianization

6 **Inclusive Development**