B.ARCH. III SEM VI
COURSE AR-601
Architectural Design Studio VI

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	**COURSE NO.**	**TEACHING SCHEME**			**THEORY EXAMS**		**PRACTICAL EXAM**				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Architectural Design Studion - VI	AR – 601	-	11	11	-	-	-	200/**80**	200	400/**192**	400

Emphasis: Architectural working drawing as tool to communicate and execute architectural design, construction details with the relevant specifications

Contents: Developing a set of working drawings for the purpose of execution and construction, architectural detailing of building components, details and function of building services like electrical, plumbing and drainage, back and forth design processes, exposure to materials, products and assembly, methods of specifications writings in the drawings

Projects: Preparing the complete set of working drawings of an independent design projects from the previous semesters

References:

1. Architects working details – Vol. 1 to 5
2. Macay, W. B. – Building construction Vol. 1 to 4
3. Stitt – Architects detail library
4. Handisyde, Cicil – Everyday details
5. Styles, Keith – Working drawing hand book
6. Woodbridge, Joseph – Details: the architects' art

B.ARCH. III SEM VI
COURSE AR-602
History of Architecture IV

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	2	3	4	5	6	7	8	9	10	11	12
History of Architecture IV	AR – 602	3	-	3	2	50/18	-	30/12	20	50/24	100

Emphasis: Evolution of the built environment or human habitat as a complex and multilayered synthesis of 'culture, climate and construction'

Contents: Study of spatial order, structure and materials, articulations, symbols and meanings in the built forms at various scales of settlements, institutions and dwellings in the following time period:

Mid 18th Century to 1950s

India

- Colonial Architecture – Calcutta, Delhi, Mumbai: Introduction of typologies – bungalows, Forrest houses, chawls etc., Architecture of Luteyen's Delhi, Banares Hindu University, Shanti-niketan, etc.
- Emerging industrial India and Indian Encounters with Modernity – Searching for Identity of a nation
- Works of Indian Masters
- Whatever happened to Vernacular Architecture?

West and others

- Industrial Revolution and its impacts
- Age of Enlightenment
- Early Modern
- Modern movement in Architecture: Modern Architectural Movement and various sub-movements from Neo-Classicism to the Pioneers.
- Works of Masters

References:

- Meaning in Western Architecture – Christian Norberg-Schulz
- A History of Architecture – Sir Banister Fletcher
- Architecture Through the Ages – Talbot Hamlin
- A History of Architecture : Settings and Rituals – Spiro Kostof
- Architecture : From Prehistory to Post-Modernity – Trachtenberg and Hyman
- Space, Time and Architecture – Sigfried Gideon
- Rethinking Architecture: a reader in cultural theory, Leach, Neil (Ed.)
- When was modernism in Indian art? - Geeta Kapur
- Architecture and Independence – Jon Lang, Miki and Madhavi Desai

B.ARCH. III SEM VI
COURSE AR-603
Building Material & Construction- VI

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	2	3	4	5	6	7	8	9	10	11	12
Building Materials & Construction – VI	AR – 603	2	2	4	3	100/36	-	60/24	40	100/48	200

Emphasis: - Overview with reference to previous studies **(Understanding of different building systems, types of foundations and its application, types of floors, types of walls, various roofing systems, Detailing of building components like openings, staircases and shading devices, application of modular and pre-cast elements, finishing and maintenance)**

- Understanding of application of materials and construction technology in context of architecture and built environment with reference to **sustainability** and **disaster resistance.**

Contents:

- Overview of different building components as a whole structure and integrated system through case studies of relevant examples.
- Basic study of natural elements like tectonic movements of earth/gravitational force, wind, fire, water, and their impact on built form.
- Relevance of appropriate construction system and material application with reference to above mentioned natural elements and their effect in context of built forms/environment.
- Understanding the concepts of sustainability and eco friendly materials and their application.

Projects: Study through practical site visits, presentations & case studies.

Reference:

1. W.**L**. Mackey , " Building Construction" Vol –I,II,III,
2. S.P. Arora & S.P. Bindra, " Building Construction"
3. R. Barry, "The Construction of Building"
4. Henry J. Cowan, "Handbook of Architectural Technology"
5. Edward Allen, "Fundamentals of Building Construction"
6. Huntington , " Building Construction"

B.ARCH. III SEM VI
COURSE AR-604
Structure- VI

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	2	3	4	5	6	7	8	9	10	11	12
Structure - VI	AR – 604	2	2	4	3	100/36	-	60/24	40	100/48	200

Emphasis : Advanced structures – Understanding & Design

Contents :

1. Design of RCC Column :
Design & detailing of axially loaded & eccentrically loaded RCC Column for regular zone & seismic zone.

2. RCC Footing :
Safe Bearing capacity of soil, Design of RCC isolated column footing, Understanding & detailing of Combined footing & Raft footing.

3. RCC Water Tank :
Types of water tank, Various types of joints in water tank, Design of on ground circular water tank, behaviour & detailing of on ground rectangular water tank, behaviour of over head water tank- Intez tank, staging & frame work required for Intez tank.

4. Prestressed Concrete :
Introduction to prestressed concrete, Concept, prestressing technique, losses in prestress, calculation of stresses at transfer & service for a prestressed concrete beam, application.

5. RCC Retaining Wall :
Behaviour, Analysis, Stability calculation, design & detailing of cantilever type retaining wall, Introduction to counter fort type retaining wall, behaviour under loading & structural detailing of wall.

6. Plate Girder & Castellated Girder:
Introduction to plate girder, types of stiffeners, Riveted & welded types of plate girder, application. Introduction to castellated girder, application & behaviour.

Project :
1. Design of structures with detailing based on course content.
2. Site visits & case studies of steel structure.
3. Making study models for various types of structures.

Reference **:**

1. H.J.shah, " Reinforced concrete, Vol- I. & II"
2. S. Ramamrutham & S. Narayan, " Design of reinforced concrete structures."
3. Sushil Kumar, "Treasure of R.C.C. Design."
4. L.S.Negi, " Design of steel structure."
5. A.S. Arya & J.L. Ajamani, "Design of steel structure."
6. INSDAG publication, " Teaching resources for steel design."
7. Srimani & Das, " Castellated girder."
8. IS 456-2000, " design of RCC elements."
9. IS 13920-1993,"Ductile detailing of RC structures subjected to seismic forces"
10. IS 800, " Design of steel structure"

B.ARCH. III SEM VI
COURSE AR-605
Estimation

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	2	3	4	5	6	7	8	9	10	11	12
Estimation	AR – 605	2	1	3	2	50/18	-	30/12	20	50/14	100

Emphasis:
Basic understanding of quantities and costs, so as to prepare estimates in the design process.

Contents:

1. Introduction
   Definition, aim and objectives.

   Scope and importance of subjects.

2. Types of Estimates
   Approximate and detailed.

A. Methods of Approximate Estimating

- Built up or Carpet area method.
- Cubic content method.
- Typical bay method.
- Current rate for approximate estimation.

B. Detailed Estimate on Item Rate Basis

- Quantities.
- Rate Analysis.
- Abstract of estimate.
- Rates for Civil Works items.
- Calculating quantities for civil works of load bearing wall structure and preparation of abstract.
- Calculating quantities for civil works of RCC frame building and preparation of abstract.

Project: Tutorial / studio work: assignment formulated to cover the above stated theory.

Reference:

1. Estimating and Costing, B. N. Dutta.
2. Estimating and Costing, P. L. Bhasin.
3. Estimating and Costing, Rangwala.
4. Professional Practice, Roshan Nanavati.

B-Arch-III Semester-VI
Course AR 606
Building Services-III

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	2	3	4	5	6	7	8	9	10	11	12
Bldg. Services – III	AR – 606	2	1	3	3	100/36	-	60/24	40	100/48	200

Emphasis: Introduction to specialized building services such as:

- Building Automation systems and devices
- Vertical Transportation
- Fire safety mechanisms
- Security and surveillance
- Intelligent Building systems.

Study of a building as an integrated set of basic and specialized services: standards, current practices and relevant technology.

Content:

1. Specialized Vertical Transportation

- Understanding the use and installation of escalators, conveyor belts, service lifts, car lifts (tower parking systems, rotary parking systems, puzzle parking systems etc.)

2. Fire safety of Buildings/ Built systems

- Introduction to fire safety and regulations.
- Fire resistance of different building materials in context of theory of combustion details.
- Causes and carriers of fire other than combustible materials.
- Fire path/route within the building and surrounding premise.
- Active and passive means to control fire
- Fire extinguishing systems
- Fire escapes.

3. Security and surveillance devices

- Introduction to security and surveillance for protective and defensive purposes as part of architectural built forms/ functional and planned areas.
- Introduction and study of elementary electronic/ electrical— techniques, materials/ fittings and fixtures such as CCTV, Access control systems, metal detectors, passive infrared detectors, electronic fencing etc. which are part of the installations of the security devices.

- Study of existing layout, application methodology and availability of fittings and fixtures.

4. Building Automation systems.

- Automatic entry systems: Automatic lifting Boom Barrier, Motorized 'P' Gates, Motorized Swing Gates, different types of sliding doors: function and application.
- Power controlled roofing systems: louvers/sliding systems

5. Intelligent Building systems.

- Concept of smart/intelligent buildings, Understanding of energy saving mechanisms (wind turbines, movable solar panels); earthquake resistant mechanisms like seismic dampers etc**.**

Project/ studio work: focuses on energy efficient, energy saving and environment friendly techniques/ materials/ systems used with "practical considerations" for implementation/ installation of the devices.

1) Introduction to requirement of security and surveillance for protective and defensive purposes**. Regulations/ Protocol/ Legal aspects (international and national)** followed for installation of security and surveillance devices (example: list of appropriate places/ functional areas as per protocol where surveillance devices can be installed).

2) Case study/literature study of a project/ functional planned areas (public, institutional, private premises) / areas not planned but adapted as functional areas (informal market places/ pedestrian areas/ outdoor open spaces), to understand the integration and execution of all services with the above mentioned (1) protocol aspects.

3) Study of innovative/Intelligent/ automated devices, as part of architectural fittings/ furnishing/ furniture/ services provided, which help in the better integration of the services and functional requirements of planned and unplanned areas.

References:

- Fire safety in buildings by V.K.Jain
- Mechanical and electrical equipments for buildings: by Stein/Reynolds/Mc Guiness
- Product catalogs and websites.

B-Arch-III Semester-VI
Course AR 607
Landscape 1

					EXAMINATION SCHEME						GRAND TOTAL
COURSE	COURSE NO.	TEACHING SCHEME			THEORY EXAMS		PRACTICAL EXAM				
		L Hours	S/P/W Hours (TW)	Credits	Duration Hours	Marks	Tutorial Marks	End Sem Marks	Conti. Eval Marks	Total (8+9+10)	Marks (7+11)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Landscape - 1	AR – 607	2	-	2	2	50/18	-	30/12	20	50/24	100

Emphasis : To develop an understanding of the basics regarding treatment of un-built spaces in architectural design and to make the student aware regarding the technology related to landscape design.

Contents :

1) Man & Nature: to understand the inter-relation and interdependence of man and nature and its effect on human psychology. Land as a resource and various issues related to landform, topography, geology, landscape elements etc. natural forms, features and forces.

2) **Site Analysis:** Visual and Physical survey and its importance, site selection criteria – study and analysis, drainage , etc.

3) **Landform:** Grading, slope analysis, cut-n-fill, infrastructure /services considerations for site development arising due to landforms.

4) **Horticulture & planting:** Basics related to horticulture and geology and various terminologies and technique related to plants and planting design. The physical and botanical features and characters of plants and planting.

Exercises :

1) Exercise related to plant and planting design.
2) Major exercise related to site analysis

References :

a. Time Saver Standards For Landscape Architecture, Charles W. Harris and Nicholas T. Dines, McGraw Hill International (1995)
b. Exterior Space design
c. Landscape Architecture, O. Simons.