

SYLLABUS

DEGREE OF BACHELOR OF ARCHITECTURE

UNIVERSITY OF MUMBAI

FOURTH YEAR ARCHITECTURE

4.1 ARCHITECTURAL DESIGNING - IV

Teaching Hours

Lecture	:	-----
Studio	:	256 periods of 45 mins. Each. (192 Hours)

Sessional Marks

Internal	:	300
External	:	600

Examination Scheme

Duration	:	-----
Marks Max.	:	-----
Marks Min.	:	-----

4.1 ARCHITECTURAL DESIGN : (STAGE – 1)

Design Problem Shall Consider :

Methods of Construction, Theory of Structures, Materials, Building Services Studied up to 3rd year.

Data Collection, Analysis And Utilisation

Site Conditions and Analysis

Climatic Conditions

User Requirements

COMMUNICATION

Transportation & Traffic Pattern

Landscape

Socio – Economic – Problems

Design problem shall consider the above and planning shall deal with the masses in relation to conservation of spaces, transportation and multiple activities such as regional bus terminal, domestic air- port, 3 star hotel, multi-storeyed office building, etc.

From this year and hence fourth students will be expected to enlarge the design brief in incorporating through research of ancillary requirements related to various functions forming part of the design problem. And the areas of various functions shall be based on data collected by the students themselves. This independent research, analysis and data collection for the design problem will form the basis to prepared them to deal with the Dissertation topic to be done in 2nd Term.

STAGE II

Design problem shall be for group of building or complex for masses for multiple activities on one site such as community centre, Educational complex. Etc. Student shall now, in planning concentrate on image building concepts.

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4.2 THEORY AND DESIGN OF STRUCTURES - IV

Teaching Hours

Lecture	: 128 periods of 45 mins. Each (96 Hours)
Studio	: -----

Sessional Marks

Internal	: 50
External	: -----

Examination Scheme

Duration	: 3 Hours
Marks Max.	: 100
Marks Min.	: 50

4.2 THEORY AND DESIGN OF STRUCTURES – FOURTH YEAR

OBJECTIVES :

- Understanding complex structural systems.
- Understanding failure of structures.
- Understanding tall structures.
- Understanding computer simulation.

1. COMPLEX STRUCTURAL SYSTEMS :

- Basic principals of analysis and design , theoretical concepts and specifications for structural system like arches, folded plates, cable structures , pre – stressed concrete structure, air inflated structures, structures, circular and rectangular water tanks. Retaining walls, diaphragm and basement walls etc.
- Theory of design of raft and pile foundations, flat slabs, combined and eccentric footings.
- Selection criteria for above type of structures.

2. FAILURE OF STRUCTURES :

- Types of failure in various structures.
- Causes of failure.
- Evaluation of damage.
- Non- destructive testing techniques.
- Techniques to prevent collapse / failure of structures.
- Repaired and rehabilitation of structures.

3. **TALL BUILDINGS :**

- Theory and principals for structural design of tall buildings.
- Study of structural systems of different existing buildings.
- Aseismic structural configurations.
- Introduction to advanced intelligent structures.
- Matrix stiffness method and finite element method.

SESSIONAL WORK :

- Structural detailing of raft slab, combined footing.
- Computer simulation of structural modelling / analysis / design.
- Understanding the basic working of few software packages with respect to type of input of output data.
- Interpretation of output information.
- Practice with a few software packages.
- Design a G + 1 structure on computer.

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4.3 ARCHITECTURAL BUILDING CONSTRUCTION – IV

Teaching Hours

Lecture	:	64 periods of 45 mins. Each	(48 Hours)
Studio	:	128 periods of 45 mins. Each	(96 Hours)

Sessional Marks

Internal	:	100
External	:	100

Examination Scheme

Duration	:	3 Hours
Marks Max.	:	100
Marks Min.	:	50

Advanced Foundations – Combined and Eccentric footing, raft foundations, pile foundations, details of pile and pile cap, sheet piling and diaphragm wall in timber, R. C. C. and Steel, buoyant foundations, basement and methods of water proofing.

Advanced floors – Flat slab diagonal and rectangular ribbed floor hollow floors (Capstone), reinforced brick floors.

Canopies and Balconies – Canopies for office buildings in R. C. C., steel, glass and cinema balconies in R. C. C. and steel with false ceiling and concealed lighting.

Furniture Design :- Counters of various types for enquiry, bar and bank, cooking ranges, room divider furniture, built in ward robe, speakers rostrum etc.

Sound Proof Construction :- Sound proof partitions and doors for recording studios, Cinemas, broadcasting studios etc.

Sessional Work based upon above topics.

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4.4 TOWN & URBAN PLANNING – I

Teaching Hours

Lecture	:	64 periods of 45 mins. Each	(48 Hours)
Studio	:	128 periods of 45 mins. Each	(96 Hours)

Sessional Marks

Internal	:	100
External	:	-----

Examination Scheme

Duration	:	3 Hours
Marks Max.	:	100
Marks Min.	:	50

PLANNING – I

Course Objectives :

1. To introduced the subject of urban, rural and regional planning to students of architecture.
2. To enable the students to relate the architectural projects in context of planning in rural, urban and regional context.
3. To create awareness on the need for planning for development and conservation.
4. To develop basic skills in planning surveys, analysis, generating alternative planning strategies and evaluation of options and preparation of plans.
5. To give the students opportunities to address the issues in planing through project work.

Course Contents (Theory)

1. Social and Economic basis for planning

Understanding the social, cultural and economic basis for planning. The evolution of society from tribal, rural and urban to present time. Relationship between social structure and spatial structure. The need for social , economical, physical, technical and environmental as part of a comprehensive planning system.

2. History of Human Settlements

The relationship between the nature of society and planning of human settlements. Indus valley civilization, ancient Indian planning, medieval planning in India, introduction to planning in other civilizations such as Egyptian, China, Mesopotamia, Greek and Roman.

3. Planning Theory

The evolution of planning theory incorporating the aim and the objects of planning. Understanding planning as a social, economic, political, technical and environmental process of shaping of living environment. Development plan, structure plans, scope and objectives, planning as an integrated systematic activity related to different sectors of economy. Understanding planning as a multi-level comprehensive process of development through local, urban, rural, regional and national planning.

4. Planning Techniques.

The students shall be introduced to planning practice in India. Methods of identifying urban and regional problems setting of goals objectives and priorities. Performance standards, spatial standards of utilities. Introduction to surveying and analytical techniques including household survey, local area surveys, land - use surveys, landscape survey, transportation surveys and service survey. Analysis of housing stock, areas needing priority attention and target group. The students shall be required to undertake survey and analysis of a giving rural / urban setting which shall be carried out as a project. The area to be analysed shall be about 10 –25 ha.

5. The evolution of modern planning concepts. Industrial revolution and urban growth. Migration and urban population explosion. The human, social and environmental problems and issues in Indian context. The need for modern planning.

Early begins of modern movement in town planning. Garden cities, radiant city and linear city concepts. The contribution by Sir Ebenezer Howard, Le Corbusier, Tony Garnier etc.

Development of new towns and cities. Study of new towns in India such as Chandigarh, Bhubaneswar, Gandhinagar and Navi Mumbai.

Sessional work based upon above topics.

PROJECT / STUDIO WORK

The students shall be assigned a planning project to be done in a group of 3-5 students. Covering an area of about 10- 15 ha in a residential / commercial / industrial / recreation / mixed user zone in an urban context incorporating different housing typologies for various income and social groups. The presentation shall include land use plan, transportation plan, landscape plan, services plan, social facilities plan, details of housing types and a project report and model.

Evaluation process

The students shall be required to submit their portfolio containing the following :

- a. The survey and analysis of an area of about 10 – 25 ha in rural / urban context.
- b. Planning proposal for a housing area of about 10 – 25 ha in rural / urban context.

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4.5 BUILDING SERVICES – III

Teaching Hours

Lecture	: 64 periods of 45 mins. Each (48 Hours)
Studio	: 96 periods of 45 mins. Each (72 Hours)

Sessional Marks

Internal	: 100
External	: 100

Examination Scheme

Duration	: 3 Hours
Marks Max.	: 100
Marks Min.	: 50

OBJECTIVES :

- Studying advanced and specialised services for complex buildings.
- Applying in architectural design and preparing layout and details.

HVAC (HEATING, VENTILATION & AIR CONDITIONING) :

- Natural ventilation
- Heating of spaces – local and central heating
- Heating equipments
- Comfort conditions, temperature control, humidity control, air filtration, rate of ventilation.
- Mechanical ventilation in buildings.
- Plenum system, exhaust system, plenum and exhaust system.
- Fans, blowers and air filters.
- Thermal conductivity and insulation.
- Air conditioning – refrigeration and air cycle.
- Various systems of air conditioning - Unit, split, Package, Direct Expansion, Chilled water System.
- Duck work and air conditioning layout, fittings and fixtures.

FIRE REGULATIONS AND DESIGN REQUIREMENTS :

- Fire, causes of fire and spread of fire.
- Fire fighting, protection and fire resistance.
- Fire fighting equipment and different methods of fighting fire.
- Code of safety, fire regulations, fire insurance.

- Combustibility of materials.
- Structural elements and fire resistance.
- Fire escape routes and elements – planning and design.
- Wet risers, dry risers, sprinklers, smoke detectors, fire dampers, fire doors, water and curtains etc.

BUILDING ACOUSTICS :

- Terminology in acoustics – Factors influencing hearing conditions.
- Sound in spaces, between spaces, effect of opening and surfaces.
- Criteria for acoustics environment criteria for reverberation in spaces. Reverberation time.
- Background noise, structure borne sound.
- Sound absorption, acoustical materials.
- Sound isolation for equipments.
- Acoustics for auditoriums and lecture halls.
- Design for good hearing, loudness and distributing, reflection and diffusion of sound.
- Various sound amplifying systems.

SESSIONAL WORK :

- Application of above studies in current design problems and preparing design layout and details.

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4.6 BUILDING BYE LAWS – I

Teaching Hours

Lecture : 32 periods of 45 mins. Each (24 Hours)
Studio : -----

Sessional Marks

Internal : 50
External : -----

Examination Scheme

Duration : -----
Marks Max. : -----
Marks Min. : -----

Survey of Bombay Municipal Corporation Act, 1888, with reference to Building Projects.

Study of Town Planning Act of 1954 in so far as it regulated the growth of built environment of Bombay till 1967.

Implications of Development Control rules for greater Bombay as approved by Government of Maharashtra on contemporary growth of built environment of Bombay.

Comprehensive study of Building Bye-laws relating to the strength and stability of structures, bye-laws relating to light and ventilation, sanitation and Buildings.

Study of special provisions in bye-laws in respect of factory and amusement buildings.

Tenures of land in Maharashtra State.

Sessional work based upon above topics.

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4.7 DESIGN DISSERTATION – I

Teaching Hours

Lecture	:	-----
Studio	:	128 periods of 45 mins. Each (96 Hours)

Sessional Marks

Internal	:	-----
External	:	-----

Examination Scheme

Duration	:	-----
Marks Max.	:	-----
Marks Min.	:	-----

Scope for design consideration :

Design dissertation on a topic (project) approved by the college separately for each student and each student shall carry out dissertation considering the following aspect :

Method of construction, advance technology (concrete and steel), advances building services, climatology, theory of structures studied up to 4th and 1st term of 5th year.

Research analysis and data collection

Site selection and justification

Climatic conditions

Socio-economic problems

Communication

Transportation

Landscape and town / urban planning

Each student's work shall include intensive dissertation on the above points and shall include briefs on selection of site, methodology of dissertation, designing of the selected project and proper presentation of the drawings as volume i and detail of the site, its analysis and justification, case studies and analysis, data, brief on structural system and services selected for the project, programme for the selected project, etc as volume ii.

Design dissertation work as per volume i and volume ii above prepared by the student during 2nd term of the 4th year and 1st term of the 5th year shall be examined by an external jury appointed by University of Mumbai.

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4.8 PROFESSIONAL PRACTICE – I

Teaching Hours

Lecture : 128 periods of 45 mins. Each (96 Hours)
Studio : -----

Sessional Marks

Internal : -----
External : -----

Examination Scheme

Duration : 3 Hours
Marks Max. : 100
Marks Min. : 50

Office :

Office set up and administration

Filing and recording of letters and drawings.

Nature of partnership, registration of firm and dissolution.

Practice Procedure and conduct, membership of professional organisation.

Architect's Registration Act.

Code of Professional Conduct.

Code relation to Architectural Competition.

Architect's Services and scale of normal and partial fees.

Architect's Act 1972 for registration.

Copy-rights of drawings.

Tenders.

Types of tenders and tenders document, tender draft notices and invitation of tenders.

Procedure for opening and selection of tenders.

Analysis and report to owner.

Work order.

Contract.

Type of contracts and contract documents, detailed knowledge about various conditions of contract as published by the Indian Institute of Architects and specially about :

Earnest Money.

Security Deposit.

Retention Money.

Mobilisation Fund.

Bank Guarantee.

Architect's Instructions.

Clerk of works.

Variation and extras.

Defects after completion.

Certificates and payments.

Insurance and fire Insurance.

Liquidate damage.

Termination of the contract.

Arbitration clause.

Arbitration, Conciliation and Mediation.

Arbitration proceedings and Awards.

Duties and liabilities in profession.

Legal responsibility of architect to Employer.

Government bodies and local bodies.

Express and implied authority of the Architect.

Architect's relationship with the client and the contractor.

Duration of liability.

Consumer Protection Act 1986.

Note : Topics marked by asterisk (*) shall be dealt with by the Teacher in general but sufficient to impart knowledge on its use and application without going into detail in its legal aspects.

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4.9 ELECTIVES

Teaching Hours

Lecture	: -----
Studio	: 128 periods of 45 mins. Each (96 Hours)

Sessional Marks

Internal	: 100
External	: -----

Examination Scheme

Duration	: -----
Marks Max.	: -----
Marks Min.	: -----

Any one of the subjects belonging to -

Design group – Housing, Urban design, Ekistics, Transportation, Town planning and Landscape Architecture (divergent). Interior Design, conservation, Urban Geography, Environment.

Building Technology and Building Services groups- professional practice valuation (Convergent) Building Management, Sustainable Building Technology, Computer (3D studio & animation).

The elective so chosen should ordinarily be belonging to the complementary groups as far as the subject for Dissertation. However an exception could be made in case of a candidate who wants to correlate work in this subject to that of the dissertation.

A satisfactory completion in the elective will be a pre requisite to taking 4th year examination.

Aesthetics – Architectural theory.