

# SYLLABUS

## DEGREE OF BACHELOR OF ARCHITECTURE

### UNIVERSITY OF MUMBAI

#### SECOND YEAR ARCHITECTURE

##### 2.1 ARCHITECTURAL DESIGN - II

###### Teaching Hours

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

###### Sessional Marks

Internal	:	150
External	:	150

###### Examination Scheme

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

##### STAGE 1

Design problem shall be urban in nature and sufficient scope for the following shall be mode :

Data collection

Climatic conditions

User requirements

Design problem shall consider the above and planning shall be for large group of people and for various activities such as nursery / primary school, Club house, Health units etc.

Design problem shall also consider methods of construction, materials, building services, theory of structures studied during 1<sup>st</sup> and 2<sup>nd</sup> years.

##### STAGE II

Design problem shall be limited to ground and first floors and load bearing construction as studied, with theory of structures. In the previous terms and shall consider :

Basic data collection and utilisation

Climatic conditions

Space conservation

Transportation

Design problem shall be related to multiple activities such as block of flats, school, 2/3 star hotel, restaurant. Recreation centre, etc.

(In this term students shall be introduced to concrete technology which shall be further elaborated upon in 1<sup>st</sup> and 2<sup>nd</sup> terms of 3<sup>rd</sup> year).

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##### 2.2 THEORY AND DESIGN OF STRUCTURES - II

###### Teaching Hours

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

###### Sessional Marks

Internal : 50  
External : ---

###### Examination Scheme

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

###### OBJECTIVES :

- Understanding of basic theories and principles of structural analysis.
- Understanding of properties of materials relevant to structural analysis.
- Understanding of behaviour of structural elements under various conditions.

###### 1. BEHAVIOUR OF STRUCTURAL ELEMENTS :

- Understanding and identifications of location of forces, bending moment and bending stress in fixed beams, over hanging beams, continuous beams, portal frames etc.
- Deflection in simply supported beams and cantilevers with distributed and point loads.
- Columns and struts-short and long columns, slenderness ratio etc.
- Combined bending and direct stresses , axial and eccentric loads effect of eccentricity, e. g. masonry wall , chimney.
- Fixed beams simple support and fixed support, advantages and disadvantages. Determination of positive and negative bending moments in fixed beams. (confine the loading to point and UDL covering full span only).
- Continuous beams – negative and positive bending moments in continuous beams covering two or more spans of uniform section and simple loading by moment distribution method. Symmetrical Portal frames.
- Strain Energy.

## 2. **FOUNDATION DESIGN - SOIL ASPECTS :**

- Importance of the subject.
- Types of soils and their properties.
- Methods of compaction and consolidation.
- Void ratio, porosity, bulk density, moisture content, degree of saturation, liquid limit, plastic limit. Etc.
- Test for assessing load bearing capacity of soil.
- Soil properties and characteristics relevant to the design of foundations.
- Criteria for selection of foundation type for different soil conditions.
- Effect of water level, settlement of soil.
- Failure of foundation systems.
- Improvement of soil properties.
- Design procedure for simple load bearing foundations.

### **SESSIONAL WORK :**

- Testing of various materials such as brick cement, sand etc. in the workshop.
- Seminars on soils, foundations and frame structures and documentation of the same.
- Plates on soil aspects.

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##### 2.3 ARCHITECTURAL BUILDING CONSTRUCTION - II

###### Teaching Hours

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

###### Sessional Marks

Internal	:	100
External	:	----

###### Examination Scheme

Duration	:	3 Hrs. ( To be combined with building materials or 30 marks. Hence
Marks Max.	:	70
Marks Min.	:	50 minimum mark combined at 50. )

**Timbers Doors and Windows** - Fully panelled single and double shutter doors of various types and sizes, fully glazed window and ventilators details of joints thereof. Fixed glass and timber louvered windows.

**Steel Windows** – Steel casement windows, with fixtures and fitting and methods of fixing.

**Timber Floors** – Single, double and framed floors with joints between joist with wall plate, joist with beam and sub beam with main beam, strutting of joists, use of templates, for support.

**Staircases** – Trade and riser and relation between them, single, double ( Dog legged and open well ) and Tripe Flight stairways in stone and timber, balusters and handrail in stone, Timber and steel, details of joints.

**Sessional Work based upon above topics.**

**Timber Trusses** – King post and queen post trusses with details of joints, alternative arrangements for tile and sheet roof covering, detail of eaves projection with soft boarding, alternative detail of gutter at eaves, sprocket joint.

**Light Partitions** – timber, Asbestos sheet and soft board and glazed partitions, W. I. And R. C. C. grilled enclosures.

**False Ceiling** – False ceiling of asbestos sheets, soft boards, acoustic boards, plaster of paris etc. on timber and steel or aluminum frame work, details of lighting and air conditioning grid panels, concealed lighting.

**Hollow Walls** – Cavity walls in brick and hollow concrete blocks.

**Sessional Work based upon above topics.**

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#### SECOND YEAR ARCHITECTURE

##### 2.4 BUILDING MATERIAL - II

###### Teaching Hours

Lecture : 32 periods of 45 mins. each  
Studio : ----

###### Sessional Marks

Internal : 50  
External : ----

###### Examination Scheme

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

**Paints and Varnishes** – Composition, manufacture and properties and uses of ordinary paints. Varnishes and wood preservatives, method of distempering wall surfaces, and painting of timber and iron work.

**Roofing Sheets and Tiles** – Corrugated galvanised iron sheets and asbestos cement sheets with accessories shingles etc. and method of their fixing. Clay manglore, Allahabad and country type tiles, their properties and method of fixing.

**Timber board** –Plywoods – Block Boards - Particles Boards – Hard Boards - Veneers.

**Eco Friendly Boards** – Eco Boards, Soft Boards, Nuwood, and Laminates.

**Natural Floor Finishes** – Shahabad, Kotah different types of Marble, Granite etc.

**Artificial Floors Finishes** – Ceramic tiles, Mosaic tiles, Cement tiles, Pavior Cement Block etc.

# SYLLABUS

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##### 2.5 HISTORY OF ARCHITECTURE - I

###### Teaching Hours

**Lecture** : 96 periods of 45 mins. each (72 Hours)  
**Studio** : ----

###### Sessional Marks

**Internal** : 50  
**External** : ----

###### Examination Scheme

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

##### STAGE I

Development of various styles with reference to the influencing factors such as Geographical, Geological, climatic, religious social and political conditions.

1. Prehistoric Architecture
2. Egyptian Architecture
3. West Asiatic Architecture
4. Classical Greek Architecture
5. Classical Roman Architecture
6. Early Christian and Byzantine Architecture
7. Romanesque Architecture
8. Gothic Architecture

Sessional work of 25 marks shall be assessed by the Jury of internal examiners – one example from each of the above topic shall be selected and the candidates shall submit informative notes with neat sketches.

##### STAGE II

Development of the style under the influencing factors and forces with regard to –

- Renaissance Architecture in Italy, France and England.
- Study of modern (Contemporary) Architecture.
- Greek Revival.
- Gothic Revival.
- Industrial revolution and its influence on social, economic conditions and architecture of that period.
- Scientific and technological progress, invention of new materials.
- Characteristics of modern Architecture and its necessity in changed pattern of life. Invention of Reinforced cement concrete, and its revolutionary effect on construction.

- New construction methods and structural systems such as geodesic dome, space frame, prefabrication, etc.

Sessional work of 25 marks shall be assessed by Internal Examination in Jury which include:

1. Detail study of any one example from renaissance Architecture in Italy, France, England with informative notes.
2. Biography of any four Architects who have contributed in development of Architecture. The students shall submit informative notes about their life, Philosophy and work with example.



# SYLLABUS

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#### SECOND YEAR ARCHITECTURE

##### 2.6 BUILDING SERVICES - II

###### Teaching Hours

Lecture	:	64 periods of 45 mins. each (48 Hours)
Studio	:	64 periods of 45 mins. each (48 Hours)

###### Sessional Marks

Internal	:	100
External	:	----

###### Examination Scheme

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

##### OBJECTIVES :

- Studying services for complex buildings and neighbourhood.
- Applying in Architectural design and preparing layout and details.

##### SECTION – I

##### WATER SUPPLY, DRAINAGE AND SANITATIONS :

- Sources of water supply and method of supply.
- Catchment areas, reservoirs, and their location.
- Water purification systems, control systems, supply for a neighborhood and town.
- Water supply for multi storeyed buildings and industrial projects.
- Site planning from drainage point of view.
- Storm water drains, details of construction, water entrances, gullies, open drains, gradients, ventilation of drains, rainfall maintenance.
- Sewage and sewage treatment, plans, buy products, gas plants.
- Connection of house sewers to municipal sewers, ventilation of sewers.
- Sewage disposal scheme for small projects and towns.
- Garbage disposal, incinerator, dry disposal.
- Garbage disposal in multi –storeyed buildings, dry and wet treatment.
- Treatment of industrial refuse.
- Refuse and pollution problems.

## **SECTION – II**

### **ELECTRICITY :**

- Day lighting, and Day light factor.
- Distribution of electric power for large projects.
- Transformers, sub-stations, LT rooms.
- By laws pertaining to installations and load of electric supply.

### **SESSIONAL :**

- Preparing water supply, drainage and sanitation design layout and details for a residence and apartment block.
- Preparing electricity layout and details for a residence and apartment block.
- Conducting market study and collecting informative brochures and specifications on various products available.

**SYLLABUS**  
**DEGREE OF BACHELOR OF ARCHITECTURE**  
**UNIVERSITY OF MUMBAI**  
**SECOND YEAR ARCHITECTURE**

**2.7 CLIMATOLOGY - 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.** : ----

Effect of climate on man, shelter and environment.

Human comfort conditions – Comfort chart, Comfort Zone, Effective temperature.

Macroclimate and Micro climate.

Effect of landscape Elements on Climate and Architecture.

Impact of climate and building on Ecological balance – introduction.

Solar radiation and Architecture.

Air flow patterns inside buildings and in building layouts.

Effect of Humidity on buildings.

Thermal effect on building materials.

Regional approach in the application of the principals of climate control in the Design of Buildings.

Sessional work based upon above topics.

**SYLLABUS**  
**DEGREE OF BACHELOR OF ARCHITECTURE**  
**UNIVERSITY OF MUMBAI**  
**SECOND YEAR ARCHITECTURE**

**2.8 SURVEYING AND LEVELLING - I**

**Teaching Hours**

<b>Lecture</b>	<b>:</b>	<b>32 periods of 45 mins. each (24 Hours)</b>
<b>Studio</b>	<b>:</b>	<b>64 periods of 45 mins. each (48 Hours)</b>

**Sessional Marks**

<b>Internal</b>	<b>:</b>	<b>100</b>
<b>External</b>	<b>:</b>	<b>----</b>

**Examination Scheme**

<b>Duration</b>	<b>:</b>	<b>----</b>
<b>Marks Max.</b>	<b>:</b>	<b>----</b>
<b>Marks Min.</b>	<b>:</b>	<b>----</b>

**Introduction** - Aim, objects, and importance of subject, scope of subject for Architects.

Brief history of land surveys executed by Government Departments, with particular reference to surveys of Mumbai City, Index Map and N. S. sheets, information and working of land Records office.

Reading of survey Maps, understanding of features and undulations of Ground.

Reconnaissance.

Chain Survey and Triangulation.

Study of instruments used for chain survey viz : (1) Chains, (2) Ranging Rods, (3) Tapes, (4) Optional square, (5) Octagonal Cross Staff, (6) Cylindrical cross Staff.

Chain Line ranging, measurements of offsets , Overcoming obstacles.

Recording of chain survey, scales used in Plotting.

Calculation of area by method of triangles, by Simpson Rule, using graph paper and by planimeter, Hectare and Acre.

Traverse Survey.

Instruments used viz Prismatic compass and Theodolite and temporary adjustment.

Recording measurements of a Prismatic Compass survey, Magnet Meridian, back Fore and reduced bearing, local attraction and its correction.

Plotting of Traverse survey, Elimination of closing error.

Various uses of Theodolite, Finding out heights or distances of inaccessible structures, lining out of large factory type buildings and roads, advantages of prismatic compass.

Sessional work based upon above topics.

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##### 2.9 INTERIOR DESIGN - I

###### Teaching Hours

Lecture	:	-----
Studio	:	96 periods of 45 mins. each (72 Hours)

###### Sessional Marks

Internal	:	100
External	:	-----

###### Examination Scheme

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

Interiors in Residence :

- (a) Space organization in interiors.
- (b) Surface treatments in interiors, e.g. on walls, floors, ceilings etc.
- (c) Different types of materials that are available and their uses in interiors.
- (d) Constructional details of various furniture units.
- (e) Application of colour, texture, pattern and their psychological effects in interior.
- (f) Introduction to history of furniture & importance of styles related to furniture design.

# SYLLABUS

## DEGREE OF BACHELOR OF ARCHITECTURE

### UNIVERSITY OF MUMBAI

#### SECOND YEAR ARCHITECTURE

##### 2.10 HUMANITIES - II

###### Teaching Hours

Lecture	:	64 periods of 45 mins. each (48 Hours)
Studio	:	-----

###### Sessional Marks

Internal	:	50
External	:	-----

###### Examination Scheme

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

- Rise of Christianity
- Medieval Europe
- Rise of Islam
- Renaissance, Reformation and geographical discoveries.
- South Indian Empires- Pallavas, Cholas and Pandyas
- Medieval societies of India.
- Mughal art and Architecture
- Baroque and Rococco periods in Europe
- Impacts of French and industrial Revolutions
- Emergence of Modern Art and Architecture
- Features of Developing Countries.
- Rural life in India with special reference to problems regarding rural, land, labour and rural work / employment schemes.
- Changes in rural life style in contemporary India.

Sessional work based upon above topics.

## SYLLABUS

### DEGREE OF BACHELOR OF ARCHITECTURE

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#### SECOND YEAR ARCHITECTURE

##### 2.11 GRAPHICS - II

###### Teaching Hours

<b>Lecture</b>	<b>:</b>	<b>96 periods of 45 mins. each (72 Hours)</b>
<b>Studio</b>	<b>:</b>	<b>-----</b>

###### Sessional Marks

<b>Internal</b>	<b>:</b>	<b>50</b>
<b>External</b>	<b>:</b>	<b>-----</b>

###### Examination Scheme

<b>Duration</b>	<b>:</b>	<b>-----</b>
<b>Marks Max.</b>	<b>:</b>	<b>-----</b>
<b>Marks Min.</b>	<b>:</b>	<b>-----</b>

- 1) Perspective by measuring point method.
- 2) Perspective of interiors.
- 3) Shades and Shadows in perspective.
- 4) Rendering techniques in different mediums.
- 5) 3 – point perspective of high rise structures.

Sessional work : The student shall submit perspectives of two interior design projects and two perspectives of exteriors of the buildings showing surrounding human figures, vehicles, etc. rendered in water colour.

This sessional work carries 50 marks and shall be assessed by the internal & External Examiner at the end of the academic year.



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##### 2.12 COMPUTERS - I

###### Teaching Hours

Lecture	:	-----
Studio	:	64 periods of 45 mins. each (48 Hours)

###### Sessional Marks

Internal	:	50
External	:	-----

###### Examination Scheme

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

An Architects office is a complex organization. It has to deal with many other functions besides just doing Architectural drawings as such a complete management outlook of the Architects office necessary. Computers have demonstrated that by their effective use the efficiency of a cross section of the work force can be improved.

Although CAD is an integral part of the Architects operative. It still remains only as a part, CAD is also highly technical and thus tends to be a bit difficult to grasp, Exposing young aspirant is thus than in to two phases.

The first phase deals with computer fundamentals which are necessary to be efficient with the computer. It deals with basic word processing and spread sheet function with emphasis on application like generation of letters, preparation of report etc.

The course then goes on to teach graphic application other than CAD for fast and attractive presentation of themes and ideas. After this phase the student should be ready with the fundamental understanding of the computers to be expose to the extensively technical subject of the CAD.

It is expected that the student before going to the second stage would have gone through fundamentals of the Architectural course.. They are now ready to embarge on a more detailed study on the intricacies of architectural. They are expected to apply their basic knowledge and convert same in to a creative output. At this stage visualization of their design is much easier and would help them to identify various error that may have possibly crept in. Specialized CAD package have the facility to allow 3 D Design as well as simulation. It is proposed to teach this packages as it will allowed the students to not only appreciate and grasp them better but also test some of the design concept on this software.

Sessional work shall consist of presenting a design programme / projects done under graphics II on CAD.

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