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# UNIVERSITY OF MUMBAI



## **Syllabus for the Bachelor of Architecture**

**Programme : B. Arch.**

**Bachelor of Architecture  
(Semester V & VI )**

(As per Credit Based Semester and Grading System with  
effect from the academic year 2014–2015)

## Scheme of Teaching and Examinations Bachelor of Architecture (B. Arch.) Semester V

Semester V Exam conducted by individual colleges		Teaching Scheme		Credits		
Sub. No.	SUBJECTS	Lecture	Studio	Theory	Studio	Total
BARC 501	Architectural Design Studio 5		8		8	8
BARC 502	Allied Design Studio 5		3		3	3
BARC 503	Architectural Building Construction 5	3	3 classes of technology studio	3	1	4
BARC 504	Theory & Design of Structures 5	2		2	1	3
BARC 508	Architectural Building Services 3	2		2	1	3
BARC 505	Humanities 5	3		3		3
BARC 507	Architectural Representation & Detailing 5	2	2	2	2	4
BARC 509	Architectural Theory 3	2		2		2
BARP 520	College projects 5		3		3	3
BARE 521	Elective 5		3		3	3
	Total	14	22	14	22	36

Semester V Exam Exam conducted by individual colleges		Examination Scheme			
Sub. No.	SUBJECTS	Theory (paper )	Internal	External viva	Total
BARC 501	Architectural Design Studio 5		100	100	200
BARC 502	Allied Design Studio 5		100		100
BARC 503	Architectural Building Construction 5	50	50		100
BARC 504	Theory & Design of Structures 5	50	50		100
BARC 508	Architectural Building Services 3	50	50		100
BARC 505	Humanities 5	50	50		100
BARC 507	Architectural Representation & Detailing 5		100		100
BARC 509	Architectural Theory 3		50		50
BARP 520	College projects 5		100		100
BARE 521	Elective 5		100		100
	Total	200	750	100	1050

# **Syllabus (Course Content) for Third year B. Arch. Course Semester V**

## **501 Achitectural Design Studio 5**

**Credits-8**

### **Teaching Hours**

Lectures- -----

Studio- 144 periods of 50 minutes duration -120 hours

### **Sessional marks-**

Internal- 100

External ---100

### **Course Objectives**

- To understand the potential of urban land and optimization of spaces
- To understand architectural forms, and corresponding functions for different types of buildings.

### **Expected Course out come**

Architecture for urban commercial, recreation, entertainment activities for large group of people with respect to following

- Development of appropriate architectural forms, their grouping and composition,
- Provision of spaces required for various activities.
- Provision of spaces for required infrastructure and services

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## **502 Allied Design Studio 5**

**Credits-3**

### **Teaching Hours**

Lectures

Studio- 54 periods of 50 minutes duration – 45 hours

### **Sessional marks-**

Internal- 100

External -----

The course content will be developed by the individual colleges as per their choice of Allied Design scheme.

**Credits-3**

## **503 Architectural Building construction 5**

**Credits-4**

**Teaching Hours-**

Lectures-54 periods of 50 minutes duration- 45 hours

Studio- 54 periods of 50 minutes duration- 45 hours to be conducted as technology studio (out of which 15 hours are considered for credit calculations)

**Scheme of examination**

Theory: one paper of three hours duration Max. marks- 50 Min marks for passing- 20

**Sessional marks-**

Internal- 50 marks

External ----

Building Skin in various light weight materials.

**: Building Skin in various lightweight materials for Framed Structure**

- Curtain walls with transoms, mullions and infilling panels of various materials
- Suspended glazing
- Composite panel cladding to the existing structure

**Canopies in various materials.****Foundation Systems**

Types of foundation systems,

Shallow foundations

Concept of Buoyant Foundation

Spread Foundation, its need and application

Raft Foundations of various types viz. Slab, Slab & Beam, and Cellular type

Foundation Walls

Column footings- Strip, Combined, and Cantilevered footings

Sessional work based upon above in the form of case studies, site visits, sketches, Drawings.

**504 Theory and Design of structures 5****Credits 3****Teaching Hours**

Lectures- 36 periods of 50 minutes duration- 30 hours

Studio- 54 periods of 50 minutes duration- 45 hours

( to be conducted as technology studio out of which 15hours are considered for credit calculations)

**Scheme of examination**

Theory -one paper of two hours duration Max. marks- 50 Min marks for passing- 20

**Sessional marks-**

Internal- 50

External ----

Theme- Structural steel design of primary elements

1. Understanding steel table and readily available steel sections in market.
2. Understanding connections  
Riveted , welded, and bolted for steel framed building, trusses etc
3. Design of tension members in trusses
4. Design compression members in trusses and columns
5. Design of beams
6. Design of foundations, slab base, gusseted base and grillage

Sessional work based upon above .

**505 Humanities 5****Credits 3****Teaching Hours**

Lectures- 54 periods of 50 minutes duration – 45 hours

Studio- -----

**Scheme of examination**

Theory -one paper of two hours duration Max. marks- 50 Min marks for passing- 20

**Sessional marks-**

Internal- 50

External -

**Theme- Art and Architecture**

Modern movements in art and architecture

Between the wars

After the wars

Architectural evolution influenced by developments in technology and structural systems

Postmodern (and late-modern) movements in art and architecture

Critical and philosophical influences on architecture after the 1980s

Critical regionalism

Deconstruction

Architectural and art trends in the first decade of the millennium

Art and architecture in India since independence

Modernism

Architecture for the State

Influence of Le Corbusier and Kahn

Indian modernists

The influence of Vistara and the validation of the vernacular  
Critical regionalism

Architectural and art trends in the first decade of the millennium in India

### **507 Architectural Representation and detailing**

**Credits- 4**

**Teaching Hours**

Lectures- 36 periods of 50 minutes duration-30 hours

Studio- 36 periods of 50 minutes duration – 30hours

**Sessional marks-**

Internal- 100

External ----

Theme-A.Quantity Surveying and Estimating  
B.Specifications

Introduction:-Definition, Aim and object, Scope and importance of subject.

Types of Estimates- Approximate and Detailed.

Methods of Approximate Estimating – Built up or Carpet Area Method, Cubic Contents, Method and Numbers System, Current Rates in Bombay for Approximate Estimating.

Detailed Estimate on item rate basis- Quantities and Abstract of Estimate, Bill of Quantities of a Tender, Contingencies.

Rates for Civil work items- as per Municipal or P.W.D. Schedule Rates and Current market rates in Bombay, Units for rates.

Taking out quantities for civil works of Load Bearing structures and preparation of Abstract.

Taking out quantities for civil works of Load Bearing structures and preparation of Abstract.

Sessional Work based upon above topics.

B. Specifications

Importance of specification in the construction activities

Methods of drafting specifications with correct order and sequence

Types of specifications-detailed and brief, open and restricted, performance, and standard ( Indian standard Specifications and P.W.D. specifications )

Language of specifications

Organization of project specifications

Sessional work

Brief specification of a building project

### **508 Architectural Building services 3**

#### **Credits 3**

#### **Teaching Hours**

Lectures- 36 periods of 50 minutes duration- 30 hours

Studio- 54 periods of 50 minutes duration- 45 hours

( to be conducted as technology studio out of which 15hours are considered for credit calculations)

#### **Scheme of examination**

Theory: one paper of two hours duration Max. marks- 50 Min marks for passing- 20

#### **Sessional marks-**

Internal- 50 marks

External ----

#### **Electricity**

#### **Lighting**

#### **Acoustics**

Electrical services:

Basic concept of electricity: direct and alternating currents

Three phase and single phase supply

Electrical supply to sites and distribution to buildings

Electrical distribution within buildings

Electrical layouts for interior spaces

Open and concealed wiring

Types of wires

Wiring accessories

Concepts of electrical safety- Earthing, MCB, elcb, lightning conductor

Artificial lighting

Direct and indirect lighting

Types of lamps

Illumination levels

#### **Acoustics-**

concept and terminology

Room Acoustics

Propagation and reverberation of sound

Acoustics for lecture halls and Auditoriums

Sessional work based upon above.

### **509Architectural theories 3**

**Credits- 2****Teaching Hours**

Lectures- 36 periods of 50 minutes duration – 30 hours

Studio- -----

**Sessional marks-**

Internal- 50 marks

External ---

**RESEARCH AND CRITICISM****Objectives:**

1. To understand the fundamentals of theoretical architectural research, its objectives and its essential methodologies.
2. To be able to build up from documentation and data collection to critical analysis and evaluation. Bloom's Taxonomy may be used by teachers to convey the various levels in research and evaluation to students.
3. To develop an attitude of Critical Thinking (reflective reasoning about beliefs and actions and ways of deciding whether a claim is always true, sometimes true, partly true, or false, from Robert Ennis) and its essential dimensions: the analysis, assessment, dispositions, skills and abilities and obstacles or barriers to critical thought (from [criticalthinking.org](http://criticalthinking.org))

Sessional Work: This semester small projects of research and reflective writing shall be undertaken by students to develop personal skills of research presentation and critical evaluation (using previously gained knowledge of referencing and citation). Students should be encouraged also to write pieces that are argumentative, and disputational to be able to convey with clarity and effectiveness alternative and individualistic thinking about architecture.

**520 college projects 5****Teaching Hours-**

54 periods of 50 minutes duration – 45 hours

**Sessional marks-**

Internal- 100

External -----

*(to be developed by individual colleges)*

The following is a representative list of what may constitute college projects:

Research and documentation, Seminars, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

**521 electives 5****Credits- 3****Teaching Hours**

Studio- 54 periods of 50 minutes duration – 45 hours



**Sessional marks-**

Internal- 100

External -----

*(to be developed by individual colleges)***Technology Studio**Credit and marks as per the scheme of examination for individual courses**Teaching Hours**

Studio- 54 periods of 50 minutes duration – 45 hour

**Objectives**

Integration of courses

Combined studio time

Technology studio is the studio time for students where guidance for technical courses will be available.

Combined Studio classes to be used for Sessional work for individual courses as well as for integration of courses

DETAILS OF SCHEME OF EXAMINATION  
TO BE CONDUCTED BY COLLEGES.

BACHELOR OF ARCHITECTURE: SEMESTER V

SUB. NO.	COURSES	No of Papers	Duration	Max Marks	Min Marks for Passing	SESSIONAL MARKS				Max Marks for the Course
						INTERNAL		EXTERNAL		
BARC 501	Architectural Design 5	---	----	---	---	100	50	100	50	200
BARC 502	Allied Design 5	----	---	---	---	100	50	---	----	100
BARC 503	Architectural Building Construction 5	1	3 HOURS	50	20	50	25	---	---	100
BARC 504	Theory and Design of Structures 5	1	2HOURS	50	20	50	25	---	---	100
BARC 505	Humanities 5	1	2HOURS	50	20	50	25	---	---	100
BARC 507	Architectural Representation & Detailing 5	---	---	---	---	100	50	---	---	100
BARC 508	Architectural Building Services 3	1	2HOURS	50	20	50	25	----	----	100
BARC 509	Architectural Theory 3	---	---	---	---	50	25	---	---	50
BARP 520	College projects 5	---	---	---	---	100	50	---	---	100
BARE 521	Elective 5	---	---	---	---	100	50	---	---	100
<b>Total marks for the examination</b>										<b>1050</b>

**Notes:** Theory, Internal sessional work, and External viva are considered as separate heads of passing

Total marks for the examination = 1050

Minimum marks for passing the examination= 525

## Scheme of Teaching and Examinations Bachelor of Architecture (B. Arch.)

### Semester VI

Semester VI Exam conducted by University of Mumbai		Teaching Scheme		Credits		
Sub. No.	COURSES	Lecture	Studio	Theory	Studio	Total
BARC 601	Architectural Design Studio 6		8		8	8
BARC 602	Allied Design Studio 6		3		3	3
BARC 603	Architectural Building Construction 6	3	3 classes of technology studio	3	1	4
BARC 604	Theory and Design of Structures 6	2		2	1	3
BARC 608	Architectural Building Services 4	2		2	1	3
BARC 605	Humanities 6	3		3		3
BARC 607	Architectural Representation & Detailing 6		6		6	6
BARP 620	College projects 6		3		3	3
BARE 621	Elective 6		3		3	3
	Total	12	24	12	24	36

Semester VI Exam conducted by University of Mumbai		Examination Scheme			
Sub. No.	COURSES	Theory (paper)	Internal	External viva	Total
BARC 601	Architectural Design Studio 6		100	100	200
BARC 602	Allied Design Studio 6		100		100
BARC 603	Architectural Building Construction 6	50	50		100
BARC 604	Theory and Design of Structures 6	50	50		100
BARC 608	Architectural Building Services 4	50	50		100
BARC 605	Humanities 6	50	50		100
BARC 607	Architectural Representation & Detailing 6		100	100	200
BARP 620	College projects 6		100		100
BARE 621	Elective 6		100		100
	Total	200	700	200	1100

# **Syllabus (Course Content) for Third year B. Arch. Course Semester VI**

## **601 Architectural Design Studio 6**

**Credits-8**

### **Teaching Hours**

Lectures- -----

Studio- 144 periods of 50 minutes duration -120 hours

### **Sessional marks-**

Internal- 100

External ---100

### **Course Objectives**

- To understand nature of Urban institutions,
- To understand the context and character for urban institutions
- To understand requirement of architectural forms, spaces for corresponding activities

### **Course out come**

- Architecture for enhancement of institutional character
- Design development and detailing for integration of infrastructure and building systems

## **602 Allied Design Studio 6**

**Credits-3**

### **Teaching Hours**

Lectures

Studio- 54 periods of 50 minutes duration – 45 hours

### **Sessional marks-**

Internal- 100

External -----

The course content will be developed by the individual colleges as per their choice of Allied Design scheme.

## **603 Architectural Building Construction 6**

**Credits- 4**

### **Teaching Hours**

Lectures-54 periods of 50 minutes duration- 45 hours

Studio- 54 periods of 50 minutes duration- 45 hours to be conducted as technology studio  
(out of which 15 hours are considered for credit calculations)

### **Scheme of examination**

Theory: one paper of three hours duration Max. marks- 50 Min marks for passing- 20

### **Sessional marks-**

Internal- 50 marks

External ----

### **RCC Floor system for large bay sizes**

- Flat Slab Floor: Study of Plate slab, Plate slab with drops, and Plate slab with drops and column capitals
- Floors in One way and Two way ribbed slab, Waffle slab, Diagrid beam slab

### **Pre cast and Prefab building elements in various materials**

- Pre cast floor system with RCC beams, RCC Channels, and infilling floor blocks of various materials
- Connections and assembly of various building elements (prefab walls, beams, columns, chajjas, staircase flights, floor units, etc.)

Sessional work based upon above.

## **604 Theory and Design of structures 6**

### **Credits 3**

### **Teaching Hours**

Lectures- 36 periods of 50 minutes duration- 30 hours

Studio- 54 periods of 50 minutes duration- 45 hours

( to be conducted as technology studio out of which 15hours are considered for credit calculations)

### **Scheme of examination**

Theory -one paper of two hours duration Max. marks- 50 Min marks for passing- 20

### **Sessional marks-**

Internal- 50

External ----

### **1. Concrete technology as relevant to architecture**

Aggregates that constitute making of concrete, types , source and availability, grades of concrete, purpose and types of additives to concrete , use and purpose of special cements , high strength concrete, transportation of concrete, placement of concrete, compaction and curing of concrete, ready mix and site mix concrete, durability of concrete, formwork for different components of rcc

### **2. Reinforced cement concrete of primary structural elements**

Basic theory of flexure for singly and doubly reinforced sections

One way and two way slab systems and doglegged staircase

Rectangular beams

Rectangular, square & circular columns

Isolated pad, stepped & sloped footing

Precast concrete elements, its application and suitability

Steel – concrete composite construction in buildings – a very basic descriptive introduction. Encased concrete construction.

### **3. Rcc theory of grid floors**

Rectangular grid

Dia-grid

### **4. Rcc theory of flat slab**

I) with column capital and drop

ii) only drop

iii) flat plate

iv) an appreciation of the adoption of flat slab construction vis-à-vis beam / slab construction and vice-a-versa.

The above elements are to be taught with minimum calculations and with emphasis on making correct structural drawings and good structural planning leading

## **605 Humanities 6**

**Credits 3**

### **Teaching Hours**

Lectures- 54 periods of 50 minutes duration – 45 hours

Studio- -----

### **Scheme of examination**

Theory -one paper of two hours duration Max. marks- 50 Min marks for passing- 20

### **Sessional marks-**

Internal- 50

External -

## **Theme- Understanding Architecture with reference to social issues related to Urbanization**

Urbanization at global level and in India.

Globalization and its effects on urban life

Major trends urbanization and Pace of urbanization in different parts of India

Changes in the pattern of urbanization in metro cities

Growth of smaller towns into cities, and its repercussions

Problem arising out of rapid urbanization

Genesis of Urbanization

Urban population growth due to natural increase of migration into urban areas,

Nature of issues related to urban migration

Work patterns in urban areas.

### **Urban issues to be studied with special reference to**

#### **Mumbai Metropolitan Region( MMR)**

Preservation of Natural resources, natural heritage

Understanding Built heritage, and social- cultural heritage

Public spaces and public buildings with reference to accessibility, Gender, age

Transport and real Estate

Public Housing

Infrastructure development

Public Health problems

## **607 Architectural Representation and detailing**

**Credits- 6**

### **Teaching Hours**

Lectures- 36 periods of 50 minutes duration – 30 hours

Studio- 72 periods of 50 minutes duration -60 hours

### **Sessional marks-**

Internal- 100

External ---100

### **Working Drawings**

Working drawing of framed structure indicating following to appropriate scale

Foundation plan

Floor plans

Elevations and sections as necessary

Details for any three of following

Roofing system, walling system, staircase, flooring system, openings

## **608 Architectural Building services 4**

**Credits 3**

### **Teaching Hours**

Lectures- 36 periods of 50 minutes duration- 30 hours

Studio- 54 periods of 50 minutes duration- 45 hours

( to be conducted as technology studio out of which 15hours are considered for credit calculations)

### **Scheme of examination**

Theory: one paper of two hours duration Max. marks- 50 Min marks for passing- 20

### **Sessional marks-**

Internal- 50 marks

External ----

## **Theme- Fire protection for buildings**

### **Services for high rise Buildings**

#### **Fire protection**

Study of fire regulations, Code of safety

Combustibility and fire resistance of building materials

Design consideration for fire safety

Fire escape routes

Fire alarms and warning systems

Systems for fire protection and Fire fighting

Water supply for Fire fighting- Static tanks, Hydrants, Wet and dry riser, sprinklers

#### **Services for high rise Buildings** ( Space and installation requirement)

Water supply for high rise buildings

Electrical distribution for high rise buildings

#### **Vertical transportation system –**

Lifts – carrying capacity and travel time, grouping of lifts- installation requirement

Escalators-Provision of space and installation requirement

Sessional work based upon the above topics.



## **620 college projects 6**

### **Teaching Hours-**

54 periods of 50 minutes duration – 45 hours

### **Sessional marks-**

Internal- 100

External -----

*(to be developed by individual colleges)*

The following is a representative list of what may constitute college projects:

Research and documentation, Seminars, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

## **621 electives 6**

### **Teaching Hours**

Studio- 54 periods of 50 minutes duration – 45 hours

### **Sessional marks-**

Internal- 100

External -----

*(to be developed by individual colleges)*

## **Technology Studio**

Credit and marks as per the scheme of examination for individual courses

### **Teaching Hours**

Studio- 54 periods of 50 minutes duration – 45 hour

### **Objectives**

Integration of courses

Combined studio time

Technology studio is the studio time for students where guidance for technical courses will be available.

Combined Studio classes to be used for Sessional work for individual courses as well as for integration of courses



