

UNIVERSITY OF MUMBAI



Syllabus for the Bachelor of Architecture

Programme : B.Arch.

**Bachelor of Architecture
(Semester III & IV)**

(As per Credit Based Semester and Grading System with effect from the academic year 2013–2014)

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

Semester III Exam conducted by individual colleges		Teaching Scheme		Credits		
Sub No.	SUBJECTS	Lecture	Studio	Theo ry	Studio	Total
301	Architectural Design Studio		6		6	6
302	Allied Design Studio		3		3	3
303	Architectural Building Construction	3	3 classes Technology studio	3	1	4
304	Theory and Design of Structures	2		2	1	3
308	Architectural Building Services	2		2	1	3
305	Humanities	3		3		3
306	Environmental Studies	2		2		2
307	Architectural Representation & Detailing	2	2	2	2	4
309	Architectural Theory	2				2
320	College projects		3			3
321	Elective		3			3
	Total	16	20	16	20	36

Semester I II Exam Exam conducted by individual colleges		Examination Scheme			
Sub. No.	SUBJECTS	Theory (paper)	Internal	External viva	Total
301	Architectural Design Studio		100	100	200
302	Allied Design Studio		100		100
303	Architectural Building Construction	50	50		100
304	Theory and Design of Structures	50	50		100
308	Architectural Building Services	50	50		100
305	Humanities	50	50		100
306	Environmental Studies		50		50
307	Architectural Representation & Detailing		100		100
309	Architectural Theory		50		50
320	College projects		100		100
320	Elective		100		100
	Total				1100

Syllabus (Course Content) for Second Year B. Arch. Semester III

301 Architectural Design Studio 3

Credits-6

Teaching Hours

Lectures- -----

Studio- 108 periods of 50 minutes duration -90 hours

Sessional marks-

Internal- 100

External ---100

Objectives:

Understanding space requirements for various activities for small groups of people
Understanding indoor and out door spaces created by built forms.

Design Objectives

Design of spaces suitable for the intended activity

Design of spaces as per the behavioral needs of individuals and groups.

Design and detailing of built form and required infrastructure with reference to methods of construction, and materials

Design projects

Built and Un-built spaces for multiple activities for a small group of people

Built and Un built spaces for relatively larger groups.

302 Allied Design Studio 3

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.

303 Architectural Building Construction & Materials 3

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 ----

Objectives-

Understanding concepts of framed structures in R.C.C.

Understanding methods of construction of various components of R.C.C. Structures

1. Structural framing in R.C.C for low rise buildings.
- 2 Foundation Systems, Floor Systems, Wall Systems, staircases, Roof Systems,
3. Moisture and Thermal protection in R.C.C. framed low rise buildings.
4. Movable light weight partitioning and paneling, Stairs in Interior spaces.

Sessional Work : based upon above in form of sketches, drawings, Case Studies, Reports.

Application to Architectural Design Projects.

304 Theory & Design of Structures 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

External ----

Objectives:

Understanding of basic theories and principles of structural analysis

Understanding of properties of materials relevant to structural analysis

Understanding of behavior of structural elements under various conditions

1. Theory of simple bending

- a. Theory of simple bending only equations & problem.
- b. Design of timber & steel beams.
- c. Shear stress distribution.

2. Deflection

- a. Simply supported beams and cantilevers with distributed & point loads by Euler's theory.
- b. Introduction to Macaulay's method
- c. Application of deflection in structural planning

3. Direct AND Bending Stresses

- a. Combined stress distribution for Beam, column and footing
- b. Application to design the footing of wall and column (only plan dimension)

4. Basics of RCC

Grades of concrete and steel used in RCC.

Application of thumb rules for selecting dimensions of slab, beam and column for low rise and low span structures. Placement of steel based of Bending moment and shear force diagrams

5. Material testing**Cement(OPC)**

Initial and final setting time

Consistency

Fineness

Compressive strength

Sand

Bulking, silt content, Fineness modulus

Bricks

Density, Water absorption, compressive strength

305 Humanities 3

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 ----

The study of the socio-cultural circumstances, the art and the architecture of the following:

The decline of the Roman Empire

The beginnings of Christianity and the formation of the Holy Roman Empire

Early Christian architecture

The Byzantine age

The Romanesque age

Medieval Europe

The Gothic age

The rise of Islam and its impact on Europe

The Crusades and their aftermath; the fall of Constantinople

The Renaissance in Italy

The rediscovery of the Classical past and its impact on art, architecture, science and philosophy

Humanism

The Masters of the Renaissance

Mannerism

The Renaissance in the rest of Europe

The Reformation, its impact on art and architecture

The Counter-Reformation

Baroque art and architecture

The age of discovery

Colonization and the changed world order

The Enlightenment

The age of revolution: America and France

The Industrial Revolution

Its rise in England

Demographic change and urbanization

New materials and technologies and their impact

New building types for the industrial age
The battle of 'styles'; nostalgia and exoticism
Neo-Classical and Neo-Gothic architecture

The Arts and Crafts Movements in Europe
Art Nouveau
Art Deco
Early modernistic impulses
Modern movements in art
Modern movements in architecture

306 Environmental Studies

Credits-2

Teaching Hours

Lectures- 36 periods of 50 minutes duration-30 hours

Sessional marks-

Internal- 50

External ----

Objective: To study and understand passive methods of environmental control

Climatology and Building Sciences

Micro climate and Macro climate
Energy flow in building
Human comfort
Traditional methods for achieving comfort

Passive Methods of control

Natural lighting
Solar Radiations and Architecture
Air flow patterns inside buildings and in building layouts
Natural ventilation

307 Architectural Representation & Detailing 3

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 ----

Perspective-

Perspective of building elements
Perspective of interior spaces

Sciography-

Shades and shadows of buildings and parts of buildings

Sessional work – Perspective and Sciography exercises

Documentation and measured drawings

Methods of measurement of interior and exterior spaces, Building Elements.

Sessional work –

Architectural plans, sections, elevation of existing building/ interior space as per the measurements.

308 Architectural Building Services 1

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 15 hours are considered for credit calculation)

Scheme of examination

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

Sessional marks-

Internal- 50

External ----

Objectives: understanding basic services required for a building and interior spaces

Sanitation:

Sanitary appliances and user space requirement

Various types of traps used with appliances

Design of toilets

Drainage and water supply connections to various appliances

Systems of building drainage

Water supply

Direct and indirect water supply for buildings

Connection from Municipal water main- Ferrule, water meter.

Design of water storage tanks, and down take pipes

Taps and valves used with various appliances

Sessional work_

Market survey for appliances and accessories,

Water supply calculations

Water supply layout- connection from municipal main to buildings

Water supply connections within the building

Design of toilets with water supply and drainage connections

309 Architectural Theory 1

Credits- 2

Teaching Hours

Lectures- 36 periods of 50 minutes duration – 30 hours

Studio- -----

Sessional marks-

Internal- 50 marks

External ---

READING

Objectives:

1. To understand and comprehend ideas in architecture through writings in architecture
2. To appreciate architecture as the development of changing ideas over time, and as the representation of their particular time and context. To be able to chart the change of ideas chronologically over time.
3. To become familiar with and improve comprehension about architecture using theoretical texts and architectural criticism.

Sessional Work:

Students are expected to read from short and long writings about architecture and communicate their comprehension in writing and discussions/presentation in class. It is suggested that texts from the following authors be used to build up a body of knowledge about architecture (this is only a representative list):

Vitruvius, Andrea Palladio, John Ruskin, Louis Sullivan, Adolf Loos, Le Corbusier, writings from the Bauhaus, Peter Blake, Philip Johnson, Charles Jencks, Robert Venturi, Adrian Forty, Christopher Alexander, Leon Krier, Kevin Lynch, Rem Koolhaas, Bjark Engels, Charles Correa, Romi Khosla,

320 College Projects 3

Credits- 3

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:

Seminars, Tutorials/ additional classes for any course, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

321 Elective 3

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 SEMESTER III
TO BE CONDUCTED BY COLLEGES.**

BACHELOR OF ARCHITECTURE SEMESTER III DETAILS OF SCHEME OF EXAMINATION										
SR NO	Semester III EXAMINATION Exam conducted by individual colleges	THEORY				SESSIONAL MARKS				
		No of papers	duration	Max. marks	Min. Marks for passing	Internal		External		
	COURSES					Max. marks	Min. Marks for passing	Max Marks	Min. Marks For passing	Max. marks for the course
301	Architectural Design 3	---	----	---	---	100	50	100	50	200
302	Allied Design 3	----	---	---	---	100	50	---	----	100
303	Architectural Building Construction 3	1	3 HOURS	50	20	50	25	---	---	100
304	Theories and Design of Structures 3	1	2 HOURS	50	20	50	25	---	---	100
305	Humanities 3	1	2 HOURS	50	20	50	25	---	---	100
306	Environmental Studies 3	---	---	---	---	50	25	---	---	50
307	Architectural Representation & Detailing 1	---	---	---	---	100	50	---	---	100
308	Architectural Building Services1	1	2 HOURS	50	20	50	25	----	----	100
309	Architectural Theories 1	---	---	---	---	50	25	---	---	50
320	College projects 1	---	---	---	---	100	50	---	---	100
321	Elective 1	---	---	---	---	100	50	---	---	100
Total marks for the examination										1100

Total marks for the examination = 1100
Minimum marks for passing the examination= 550

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

Semester IV Exam conducted by individual colleges		Teaching Scheme		Credits		
Sub No.	SUBJECTS	Lecture	Studio	Theory	Studio	Total
401	Architectural Design Studio		8		8	8
402	Allied Design Studio		3		3	3
403	Architectural Building Construction	3	3 classes technology studio	3	1	4
404	Theory and Design of Structures	2		2	1	3
408	Architectural Building Services	2		2	1	3
405	Humanities	3		3		3
407	Architectural Representation & Detailing	2	2	2	2	4
409	Architectural Theory	2				2
420	College projects		3			3
421	Elective		3			3
	Total	14	22	14	22	36

Semester IV Exam Exam conducted by individual colleges		Examination Scheme			
Sub. No.	SUBJECTS	Theory (paper)	Internal	External viva	Total
401	Architectural Design Studio		100	100	200
402	Allied Design Studio		100		100
403	Architectural Building Construction	50	50		100
404	Theory and Design of Structures	50	50		100
408	Architectural Building Services	50	50		100
405	Humanities	50	50		100
407	Architectural Representation & Detailing		100		100
409	Architectural Theory		50		50
420	College projects		100		100
421	Elective		100		100
	Total				1050

Syllabus (Course Content) for Second Year B. Arch. Semester IV

401 Achitectural Design Studio 4

Credits-8

Teaching Hours

Lectures- -----

Studio- 144 periods of 50 minutes duration -120 hours

Sessional marks-

Internal- 100

External ---100

Objectives:

- To develop research skills for survey research and case study.
- To understand functioning of community spaces in rural areas/semi urban areas
- To study principles of design, construction, and technology based on tradition and experience.

Objectives of Design Projects

- To design spaces suitable for life style in rural/semi urban areas
- To conserve the natural surroundings and social fabric suitable for communities
- To design the buildings suitable to climatic conditions, by using local materials and traditional methods of construction.
- To understand and provide specific infrastructure required for communities.

Design projects

Built and un built spaces for Cluster & Communities,

402 Allied Design Studio 4

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.

403 Architectural Building Construction & Materials 4

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 calculation)

Scheme of examination

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

Sessional marks-

Internal- 50 marks

External ----

Objectives-

- Understanding concepts of framed structures in Steel for low medium span building
- Understanding methods of construction of various components of steel structures
- Understanding concepts of trusses for low and medium spans

1. Structural framing in STEEL for low rise medium span buildings.

2. Foundation Systems, Floor Systems, Wall / Cladding Systems,

3. Roof Systems- concepts of trusses

4. Moisture and fire protections in STEEL framed low rise medium span buildings.

Sessional work

Based on above in the form of drawings, sketches, case studies, Reports

404 Theory & Design of Structures 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 15 hours 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 ----

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. Analysis of short and long column

- a. Short & long columns, slenderness ratio etc.
- b. Euler's & Rankine's Theory

2. Analysis of fixed beams

- a. Advantages & disadvantages.
- b. Determination of negative & positive bending moments.
(confine the loading to point & UDL covering full span only).

3. Analysis by moment distribution method

Continuous two span and three spans beams with UDL and Point loads with and without support settlement. Single storey and single bay non sway frame under UDL and point load. Comparison of the analysis results of simply supported, continuous and portal frame idealization of three dimensional structures.

4. Introduction to Steel Design

Basic information about different steel section used as structural members and steel table. Brief introduction to planning of low rise and low span steel structures

5. Soil Mechanics

- a. Importance of subject.
- b. Types of soil and their properties.
- c. Methods of compaction and consolidation.
- d. Void ratio, Porosity, Bulk density, Moisture content, Degree of saturation, Liquid limit, Plastic limit, etc.
- e. Test for assessing load bearing capacity of soil.
- f. Soil properties and characteristics relevant to the design of foundations.
- g. Criteria for selection of foundation type for different soil conditions.
- h. Effect of water level, settlement of soil.
- I. Failure of foundation systems.
- j. Improvement of soil properties.
- k. Design procedure for simple load bearing foundations.

6 Material testing

Coarse aggregate

Fineness modulus

Crushing test

Concrete

Compressive strength

Slump cone test

Mangalore tile

Flexure test

405 Humanities 4

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 ----

The study of the socio-cultural circumstances, the art and the architecture of the followings:

The rise of the Mahajanapadas
The organization of kingdoms
Art and architecture of the rock cut temples
Persian and Hellenistic influences

The Mauryas and the Guptas
The legacy of Ashoka

The resurgence of Hinduism
The rise of the Shaivite and Vaishnavite traditions
The great temples of India, their design, evolution and significance
Khajuraho, Konarak, Halebid, Belur, Somnathpur, Aihole, Badami, Pattadakal
The Dravida Style
The Nagara Style
Temple towns
Timber temple traditions of Kerala and Himachal Pradesh
The rise of the Vijayanagara empire
Development of state and domestic architecture in various parts of India

The rise of Islam
Timber mosques of Kerala
The influences of the Ghorid/ Ghaznavid invasions

The establishment of the Sultanates
The Khaljis and Delhi
The later Sultanates: the Tughlaqs and the Lodhis- Art and architecture

The Gujarat and Deccan sultanates- Art and architecture
Rajput architecture

The Mughals

Babar and Humayun- Art and architecture

The interregnum of Sher Shah Suri

Akbar

His patronage, influence and syncretic legacy

Akbar's karkhanas of art, miniature painting and calligraphy

Akbar's architecture

Jehangir, Shahjehan and Aurangzeb- Art and architecture

The decline of the Mughals and the rise of regional powers

The establishment and influence of the East India Companies

The Portuguese and Dutch influence

The port cities of Calcutta, Madras and Bombay

The architecture of the Presidency towns

Company paintings

The uprising of 1857 and its aftermath

New British architecture in India

Neo-Classical architecture

Neo-Gothic architecture, its impact on Urbs Prima Indis

The influence of the Bombay School of Art on Art and architecture in the 19th century

Indo-Saracenic architecture

The urban architecture of Bombay in the early 20th century

Art movements in the early 20th century in India

The first Indian Architectural practices

Art Deco in Bombay and India

Modernist impulses in art and architecture in the years leading to independence

407 Architectural Representation & Detailing 4

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 ----

SURVEYING AND LEVELLING

Objectives:

To Understand methods of survey, and documentation,

Introduction to tools and equipments of Land surveying

Introduction to modern methods of surveying

1. Brief history of land surveys executed by Government Departments
Information and working of land record offices

2. Reading of Survey maps, understanding of features and undulation of ground

3.Chain Survey and Triangulation

A study of instruments used for chain Survey

Chains, Ranging Rods, Tapes, Optical square, Cylindrical cross staff

B. Chain line ranging, Measurement of offsets in field book

C. Recording of Chain survey measurements in field book

D. Plotting of Chain survey, scales used in plotting

E. Calculation of Area

4.Transverse Survey

A. Instruments used Prismatic compass and Theodolite

B. Recording measurements of prismatic compass survey, magnetic Meridian, Back, Fore, and reduced Bearings, Local attraction and its correction

C. Plotting of Transverse survey, Elimination of closing error

5. Various uses of Theodolite,

Finding out heights or distances of inaccessible structures

E. Lining out of large buildings, and roads

Sessional Work-

Based upon above in the form of plates, drawings, class Tests

408 Architectural Building Services 2

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 18 hours are considered for credit calculation)

Scheme of examination

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

Sessional marks-

Internal- 50

External ----

Objectives:

Understanding of external services of water supply and drainage for the buildings, and site lay outs.

Systems of building drainage

Design of under ground drainage system

Use of inspection chambers and disconnecting chambers

Connection to municipal sewer, use of Drop manhole

Ventilation of drainage system

Sewage disposal systems for small projects

Roof drainage

Site and surface drainage

Rain water harvesting

Various traps used in site layouts

Sessional Work- Drainage lay out

Surface drainage and rain water harvesting

409 Architectural Theory 2

Credits- 2

Teaching Hours

Lectures- 36 periods of 50 minutes duration – 30 hours

Studio- -----

Sessional marks-

Internal- 50 marks

External ---

WRITING

Objective:

1. To be able to write with clarity about architecture and ideas in architecture.
2. To be able to correctly use architectural terms to communicate architectural ideas.
3. To be able to convey effectively in words the thinking behind one's own designs being carried out in various studios.
4. To learn to use referencing and citation as an essential tool of writing, and to understand clearly issues and consequences of plagiarism.

Sessional Work: this semester sessional work may be carried out in the form of writing workshops leading to short and longer pieces of writing. Resources persons such as published writers, architectural journalists and academics may be invited to conduct these workshops and encourage interaction in writing and reading by the students themselves. Much of the resource material from the previous semester may be relied upon to ensure vertical continuity of the subject.

420 College Projects 4

Credits- 3

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:

Seminars, Tutorials/ additional classes for any course, Guest Lectures, putting up Exhibitions, Workshops, participating in Architectural Competitions or conducting Site Visits or Study Tours.

421 Elective 4

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 SEMESTER IV
TO BE CONDUCTED BY COLLEGES.

BACHELOR OF ARCHITECTURE SEMESTER IV DETAILS OF SCHEME OF EXAMINATION										
SR NO	Semester IV EXAMINATION Exam conducted by individual colleges	THEORY				SESSIONAL MARKS				
		No of papers	duration	Max. marks	Min. Marks for passing	Internal		External		
	COURSES					Max. marks	Min. Marks for passing	Max Marks	Min. Marks For passing	Max. marks for the course
401	Architectural Design 4	---	----	---	---	100	50	100	50	200
402	Allied Design 4	----	---	---	---	100	50	---	----	100
403	Architectural Building Construction 4	1	3 HOURS	50	20	50	25	---	---	100
404	Theory and Design of Structures 4	1	2HOURS	50	20	50	25	---	---	100
405	Humanities 4	1	2HOURS	50	20	50	25	---	---	100
407	Architectural Representation & Detailing 4	---	---	---	---	100	50	---	---	100
408	Architectural Building Services2	1	2HOURS	50	20	50	25	----	----	100
409	Architectural Theories 2	---	---	---	---	50	25	---	---	50
420	College projects 4	---	---	---	---	100	50	---	---	100
421	Elective 4	---	---	---	---	100	50	---	---	100
Total marks for the examination										1050

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

