

S-19 June & 6 July 2012 AC after Circulars from Circular No.84 & onwards - 4 -  
**DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**

**CIRCULAR NO. ACAD/NP/B.Arch.III Yr./Syllabus/84/2012**

It is hereby informed to all the concerned that, the Hon'ble Vice-Chancellor has accepted the **"Revised Syllabus of Third Year Architecture"** under the Faculty of **Engineering and Technology** on behalf of the **Academic Council Under Section-14(7) of the Maharashtra Universities Act, 1994** as appended herewith.

This will be effective from the academic year 2012-2013 and onwards.

All concerned are requested to note the contents of this circular for their information and necessary action.

University Campus,  
 Aurangabad-431 004.  
 REF.NO.ACAD/NP/B.ARCH.-III /  
 2012/18944-66

Date:- 31-07-2012.

★  
★  
★  
★  
★  
★  
★  
★

  
**Director,  
 Board of College and  
 University Development.**

\*\*\*\*\*

**Copy forwarded with compliments to:-**

- 1] The Principals, affiliated concerned Colleges,  
 Dr. Babasaheb Ambedkar Marathwada University.

**Copy to :-**

- 1] The Controller of Examinations,
- 2] The Superintendent, [ Engineering Unit ],
- 3] The Superintendent, [ Eligibility Unit ],
- 4] The Record Keeper,  
 Dr. Babasaheb Ambedkar Marathwada University.

--\*\*--

**Dr BABASAHEB AMBEDKAR  
MARATHWADA UNIVERSITY,  
AURANGABAD**



**Revised Structure and Syllabus of  
Second Year Engineering of**

**ARCHITECTURE  
THIRD YEAR**

**EFFECTIVE FROM - 2012-13 & ONWARDS**

# SEMESTER V

---

Dr. Babasaheb Ambedkar Marathwada University,  
Aurangabad

**Syllabus for Third Year Architecture Course (Part I)**

Code No.	Teaching Scheme					Examination Scheme				
	Subject	Lecture Hours	Studio Hours	Total	Term Work	Pract. Exam	Theory Exam	Total Marks	Duration	
311	Architectural Design -IV	--	10	10	100	150	--	250	--	
312	Architectural Building Construction & Material - V	02	04	06	50	75	100	225	4 hours	
313	Theory & Design of Structures - IV	04	--	04	25	--	100	125	3 hours	
314	History of Architecture - IV	04	--	04	25	--	100	125	3 hours	
315	Estimation, Costing & Specification writing	01	03	04	25	--	100	125	3 hours	
316	Environmental Science & Services -III	04	--	04	--	--	100	100	3 hours	
317	Working Drawing -I	--	02	02	25	75	--	100	--	
318	Computer Application in Architecture - III	--	02	02	50	--	--	50	--	
		<b>15</b>	<b>21</b>	<b>36</b>	<b>300</b>	<b>300</b>	<b>500</b>	<b>1100</b>		

Note: Each Lecture / Studio Hour is of 50 minutes duration.

**Subject code no. 311****Architectural Design IV**

Theory Hours: Nil  
 Studio Hours: 10  
 Total: 10 Per Week

Term Work: 100 Marks  
 Practical Exam: 150 Marks  
 Theory Exam: Nil

**Aim:**

To explore the design of buildings addressing the socio- cultural & economic needs of contemporary urban society.

**Objectives:**

- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially & culturally sensitive manner, taking into account aspects such as user perception, crowd behavior, large scale movement of people and identity of buildings
- To emphasize on the importance of understanding the relationship between open space & built form and site planning principles including landscaping, circulation network and parking.

**Contents:**

Scale & complexity of buildings and small complexes that address the social & cultural needs of contemporary urban life

**Areas of Concern/Focus:**

- Behavioral aspects
- Socio-cultural aspects
- Designing for the differently abled
- Building bye-laws & rules
- Appropriate materials & construction techniques
- Climate design

**Syllabus:**

**Ex-Servicemen's housing, Orphanages, Working women hostel, Home for physically and mentally challenged, Museum/Art centre, Educational campus, Shopping complexes, etc.**

**Term Work:**

At least two major projects and one time problem on any of the topics above. At the final practical exam one model to be presented of one of the major projects

**Books for Reference:**

1. Time saver standards for building types
2. Time saver standards for Interior Design & space planning
3. Neuferts Architects data
4. Kevin Lynch- Site planning
5. Sam I – Miller- Design process- A primer for architectural & Interior Design

**Subject code no. 312 Architectural Building Construction & Materials V**

Theory Hours: 02  
 Studio Hours: 04  
 Total: 06 Per Week

Term Work : 50 Marks  
 Practical Exam : 75 Marks  
 Theory Exam : 100 Marks  
 Duration- 4 hours

**Aim:**

To provide an understanding of various construction practices and details using steel in the structural components of a building

**Objectives:**

- To understand both in detail the methods of construction using steel for structural purposes such as foundations, steel columns, roof trusses and roof coverings
- To understand both in detail the methods of construction of building components using steel in staircases, rolling shutters, doors & windows

**Contents:****BUILDING CONSTRUCTION****Unit I: Steel Construction**

Structural steel sections: Technical nomenclature of different steel sections, construction methods, methods of connections, different types of welds, rivetting & bolting, steel in foundations, column beam connections

Steel roof trusses: Design & detailing. Types of trusses, long span, north light, space frames, portal frames, space decks- construction details of the above and the context in which they are used

Steel roof coverings: types of roof coverings using steel, aluminium, asbestos cement etc. The students should be encouraged to market survey for latest roof covering sheets available in markets.

Steel staircases: basic principles, types of staircases straight flight, dog legged, spiral & other types. Support conditions for stairs, details of handrail, balusters etc. and finishes for stairs.

**EXERCISES OF THE ABOVE THROUGH DRAWING SHEETS AND CASE STUDIES****Unit II: Steel Doors, Windows, and Rolling Shutters**

Types of doors & windows- openable, sliding, etc. methods of constructions using steel design and detailing of steel rolling shutters, collapsible gates etc. fixing details of strong room & safe deposit vault doors, ventilators

**BUILDING MATERIALS**

**Miscellaneous building materials:** Ashphalt:-Classification, forms of ashphalt, properties of ashphalt. Bitumen:-Forms and uses of bitumen. Electrical insulators:-Conductors, on conductors, properties. Fly ash:-Dry system, wet system, properties of flyash. Gypsum:-Defination, gypsum plaster, properties. Selents for joints:-Different types, properties, application accessories.

**Plastic in building industry:** Brief history, composition, polymerization, classification of plastics, use of plastics, fiber glass reinforced plastic, etc.

**Term Work:**

At least one sheet to cover each of the construction items as given above including submission of files to cover the materials parts as well as notes on construction if any

**Books for Reference:**

1. Dr. B. C. Punmiya. A text book of Building Construction
2. T. D. Ahuja and G. S. Birde- Fundamentals of Building Construction
3. Building Construction Vol. 1&2 W. B. Mckay
4. R. M. Davis.- Plastics in Building Construction
5. S. C. Rangwala. Engineering Materials
6. N. Krishna Raju. Structural Design & Drawing Reinforced Cement Concrete & steel.

**Subject code no. 313****Theory & Design of Structure-IV**

Theory Hours: 04  
 Studio Hours: Nil  
 Total : 04 Per Week

Term Work: 25 Marks  
 Practical Exam: Nil  
 Theory Exam : 100 Marks  
 Duration- 3 hours

**Aim:**

The focus is on structural design of buildings in steel

**Objectives:**

- To develop the structural design skills of the students in steel
- To enable the students to develop capacity to design steel structure

**Syllabus:**

**Unit I:** Design of simple beams including check for shear and deflection for laterally supported and unsupported conditions, analysis of simple beam from strength and stiffness considerations.

**Unit II:** Design of built up beams with flange plates only. Introduction to plate girders (no design calculations)

**Unit III:** Axially loaded tension members. Introduction, net effective areas, analysis & design of tension members, including rivetted & welded connections (L-angles & T- sections only)

**Unit IV:** Columns. Analysis and design of axially loaded steel columns using single I- section, 2 channels placed back to back and toe to toe, 4-angles etc. including lacing system

**Unit V:** design of slab base and gusseted base for axial loads. (without moments) for different columns

**Unit VI:** Design for grillage foundation for isolated columns only

**Unit VII:** Purlins: Introduction, dead load, live and wind loads, design of angle purlin & I-sections purlin

**Unit VIII:** Bracket connections: Rivetted and welded connections, design of joists

**Term Work:**

Notes and analytical part including calculations of all the items in the given units

**Books for Reference:**

1. Design of steel structures (Vol 1) by Ramchandra, Standard Book House New Delhi
2. N-Krishna Raju: Structural Design & Drawing
3. Design of steel structures by Ramamurtham. S. and Narayanan R.
4. Criteria for design a R.C.C. structure as per IS 800-2007.

<b>Subject code no. 314</b>	<b>History of Architecture-IV</b>
Theory Hours: 04	Term Work : 25 Marks
Studio Hours: Nil	Practical Exam : Nil
Total : 04 Per Week	Theory Exam : 100 Marks
	Duration- 3 hours

**Aim:**  
To expose the students to the origin, development and spread of modern architecture in Western World as well as the architectural scenario of colonialism in India

- Objectives:**
- To introduce the condition of modernity and bring out its impact in realm of Architecture
  - To study modern architecture as evolving from specific aspects of modernity, industrialization, urbanization, material development, modern art as well as society's reaction to them
  - To create an overall understanding of the architectural developments in India by colonial rule.

**Syllabus:**

**Unit I:** effects of Industrial Revolution on construction technology and Architectural design. Early movements as Eclecticism, Functionalism, Art Nouveau and Arts & Crafts movement

**Unit II:** Modern Architecture: Development Adolf Loos and critique of ornamentation Peter Behrens- Modern Architecture & Art-Expressionism, Constructivism, Cubism

**Unit III:** Bauhaus – School of Design & handicraft, Walter Gropius, Mies Van Des Rohe, growth of international style

**Unit IV:** Ideas & works of Gropius, Le Corbusier, Alvar Alto, Latest works of Frank Loyd Wright

**Unit V:** Modern Architecture- Later Directions post world war II developments & spread of international style, later works of Corbusier, Brasilia – capital of Brazil, works of Lucio Costa, Oscar Niemeyer and works of later modernist as Louis Kahn, Paul Rudolph, Eero Saarinen, Pei, Kenzo Tange

**Unit VI:** Colonial Architecture in India- colonialism & its impact, early colonial architecture, forts, bungalows, cantonments, planning of New Delhi and works of British Architects in India in pre-independent India.

**Unit VII:** Works of some of the famous Indian architects like B. V. Doshi, Charls Correa, Achyut Kanvinde, Raj Rewal, etc and impact of Chandigarh experiment on Indian Architecture

**Term Work:**

Students should submit (pencil, crayon, ink) sketches of the works of some of the famous architects, western & Indian architects with notes in file

**Books for Reference:**

1. Bahga S. S. Post Independent Architecture
2. Bhatt, Vikram and Scriver, Peter: Contemporary Indian Architecture- After the Masters
3. Curtis, J. R. William: Modern Architecture since 1900
4. Modern Architecture in United States

**Subject code no. 315      Estimation, Costing & Specification Writing**

Theory Hours: 01  
 Studio Hours: 03  
 Total: 04 Per Week

Term Work: 25 Marks  
 Practical Exam: Nil  
 Theory Exam: 100 Marks  
 Duration- 3 hours

**Aim:**

To enable students understand the method of writing specifications for various items of works involved in the building, to expose the students the procedure involved in estimating costs involved, simple projects will be introduced for preparation of specifications

**Objectives:**

- To educate the students the need and importance of specifications, how to write specifications, important aspects of the design of a specification
- To inform the students the need for estimation- the concept of abstract & detailed estimates based on measurements of materials & works
- To educate the students to work out the rates of important items in building construction based on PWD schedule of rates for the particular year/ current year

**Syllabus:**

**Unit I: Quantity Surveying Introduction**- definitions and terms used, principles, units of measurements. Methods of preparing approximate estimates (plinth area & cubic content method) basic differences & advantages, approximate estimates based on Bay Area Method, Service unit method etc.

**Unit II: Detailed building estimation**-method of obtaining detailed quantities of building items worked on measurement sheets (centre line method, long wall & short wall method), PWD systems to be followed. Definition of estimate

**Unit III:** detailed estimates for load-bearing and framed structures. (Ground floor only)

**Unit IV:** Example & exercises in obtaining estimates of all items from excavation to finishes. Percentage for addition of contingencies

**Unit V:** Preparing estimates for services like water supply, plumbing, various fittings for water supply & drainage

**Unit VI: Rate Analysis**- cost of materials and labor for various works, current rates of materials & labor to be referred from Schedule of Rates of PWD of the respective year, different methods of execution i. e. piece work, daily basis, lump sum, labor rates and percentages etc. prime cost & provisional sum

**Unit VII: Specifications**- definition, purpose and importance of specifications, general or brief specifications, detailed specifications, writing of specifications for UCR masonry, brick masonry, doors & windows, mortars, plasters, flooring like terrazzo, ceramic tiles, Indian

Patent Stone, glazed tiles etc. All RCC items, some major sanitary & water supply fixtures & fittings

**Term Work:**

Detail estimates with measurement sheets & rate abstract of at least 2 exercises each of load bearing & frame structures (Only ground floor). Rate analysis of important building items such as brick masonry, UCR masonry, all concrete & RCC items in load bearing & RCC framed buildings

**Books for Reference:**

1. Professional Practice by Roshan Namawati
2. Schedule of Rates of every year of PWD Govt. of Maharashtra
3. Estimating, Costing & valuation by Rangwala
4. Estimating & Costing (civil engineering) by B. N. Datta
5. Estimating, Costing, Specifications & valuation by M. Chakravarty

<b>Subject code no. 316</b>	<b>Environmental Sciences &amp; Services-III</b>
Theory Hours: 04	Term Work: Nil
Studio Hours: Nil	Practical Exam: Nil
Total: 04 Per Week	Theory Exam: 100 Marks
	Duration- 3 hours

**Aim:**

To familiarize the students with building services that support the functioning of building in the area of electrical wiring, lighting & conveying systems

**Objectives:**

- To inform the students of the laws & basics of electricity and wiring systems within domestic and commercial buildings
- To expose the students to the fundamentals of lighting & lighting design
- To familiarize the students to the basic design principle systems of vertical distribution systems within a building
- To expose the students with the NBC code of all of the above building services

**Syllabus:**

**Unit I:** Electrical Systems: Electrical wiring systems: Laws of electrical circuits. Ohms and kichoffs laws

Laws of electrical circuits- single/three phase supply, electricity for safety-types of earthing ISI specifications

Electrical wiring systems in domestic and commercial buildings, conduits, types of wiring, diagram for connection, bus way, bus bars, lighting track and conduits ( aluminium, metallic, non-metallic) arrangements. Power handling equipment, switch boards, panel boards. Lightning conductors: purpose, materials, fixing, earthing arrangements.

**Unit II:** Fundamentals of Lighting: principles of light- electromagnetic radiation, waves, nature of vision, measurements of lighting. Principles of illumination- definitions, visual tasks, factors affecting visual tasks, units of light, definition of flux, solid angle, luminous intensity, utilization factor, depreciation factor, brightness & glare

**Unit III:** Illumination and lighting- Electrical light sources: brief description, characteristics and application of different types of lamps, method of mounting & lighting control. Luminary's classification, lumen method for design- room reflections/ glare- manufacturer's data on luminaries/ luminaries cost.

**Unit IV:** Lighting Design: Installation and application in buildings  
Artificial light sources: special energy distribution luminous efficiency-color & their application areas and outdoor lighting. Light for offices, schools, libraries, residential, hospitals, parking, outdoors, etc  
Elementary ideas of special features, required minimum level of illumination to the physically challenged & elderly in building types. Solar energy systems for residential/ commercial buildings, reducing electrical loads, installation & maintenance

**Unit V: Lighting Design:** Basic design principles, criteria for planning, sizing, selection & layout of vertical distribution systems (lifts, escalators & moving walkways) along with mechanical dimensional details, elevators- types of elevators- design criteria, capacity, frequency, car size speed, number & size of elevators, layout of banks of elevators, planning & loading service cars in buildings, types of elevators- pit, machine room details, escalators & their uses, dimensions, angle, tread, risers, etc - NBC code

**Books for Reference:**

1. Phipps lighting in Architectural Design
2. R. G. Hopkenson & J. D. Kay. The lighting of Buildings
3. National Building Code
4. Benjamin Evans- Daylight in Architecture

**Subject code no. 317****Working Drawing- I**

Theory Hours: Nil

Term Work: 25

Studio Hours: 02

Practical Exam: 75

Total: 02 Per Week

Theory Exam: Nil

**Aim:**

The focus of the course is to impart skills related to the preparation of drawings meant for construction work on the site & to improve the students' ability of detailing

**Objectives:**

- To impart training in the preparation of working drawings for buildings (mostly load bearing ground floor structures) and incorporating specifications as complementary to the working drawings
- To sensitize the students in preparing finer design details required for buildings

**Syllabus:**

**Unit I:** Preparation of working drawings: suitable scales of drawing, methods of giving dimensions: on plans, sections, elevations and other standards

**Unit II:** Preparation of plans: site plan with all dimensions, centerline plan, foundation plan, terrace floor plan

**Unit III:** Elevations & Sections: all side elevations, sections sufficient to explain (1 section through staircase & one through the toilet block) the scheme

**Unit IV:** Detail layout for sanitation, water supply and electrical layout (plans showing internal & external lines of sanitation, water supply & electricity), staircase details including railing, handrail details, details of toilet with fittings kitchen, platform details with built in cupboards

**Unit V:** Detailing of architectural elements such as balconies, verandahs, RCC canopy, other shading devices

**Unit VI:** Details of doors & windows, teak wood fully paneled doors/ commercial flush door shutters/ steel/ aluminum glazed windows, joinery details of doors & windows, details of fittings

**Term Work:**

The students have to prepare two working drawing sets of residential buildings (150-200 sq m) of a load bearing structure

**Subject code no. 318****Computer Application in Architecture III**

Theory Hours: Nil

Term Work: 50

Studio Hours: 02

Practical Exam: Nil

Total: 02 Per Week

Theory Exam: Nil

**Aim:**

The lecture/studio programmed to engage students with understanding of the various soft wares, visual languages, design fundamentals, visual literacy which provide the fundamental understandings required for the medium

**Objectives:**

- To educate the students to further architectural design skills through advanced computer applications
- To focus in the area of computational media techniques & technologies & their impact on architectural design and production.

**Syllabus:**

**Unit I:** Introduction to digital theory and its unit that equips students with an understanding of the territory of computational design through its theoretical vocabulary & relevant histories

Making of architectural vector diagrams to explore design and for digital communication using vector applications like coral draw, illustrator, etc.

**Unit II:** 3D modeling and different types of methods in 3D modeling like polygonal and building information modeling (BIM) etc. to design & test architectural built environments virtually

**Unit III:** Scene Setup: involves arranging virtual objects, lights, camera and other entities on a scene which will later be used to produce a still image or an animation, image processing and video editing to create architectural walkthroughs

**Unit IV:** Building Information & Modeling: using three dimensional, real time dynamic building modeling software to increase productivity in building design and construction, the process produces building information model which encompasses building geometry, spatial relationships geographic information modeling application like Revit Architecture, Auto CAD etc.

**Term Work:**

Students should produce 3D model and drawings with walkthroughs, interior layouts, landscape elements etc. of at least 1 residential & 1 commercial project

# SEMESTER VI

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad  
**Syllabus for Third Year Architecture Course (Part II)**

Code No.	Teaching Scheme				Examination Scheme					Total Marks	Duration
	Subject	Lecture Hours	Studio Hours	Total	Term Work	Pract Exam.	Theory Exam.				
321	Architecture. Design -V	--	10	10	100	50	100	250	18 hours		
322	Architectural Building Construction & Material - VI	02	04	06	50	75	100	225	4 hours		
323	Theory & Design of Structures V	04	--	04	25	--	100	125	3 hours		
324	Human Settlement Science	04	--	04	--	--	100	100	3 hours		
325	Environmental Science and Services - IV	04	--	04	--	--	100	100	3 hours		
326	Working Drawing -II	--	04	04	25	75	--	100	--		
327	Contemporary Architecture (seminar)	04	--	04	75	--	--	75			
		<b>18</b>	<b>18</b>	<b>36</b>	<b>300</b>	<b>200</b>	<b>500</b>	<b>1000</b>			

Note: Each Lecture / Studio Hour is of 50 minutes duration.

**Subject code no. 321****Architectural Design V**

Theory Hours: Nil

Term Work : 100 Marks

Studio Hours: 10

Practical Exam : 50 Marks

Total : 10 Per Week

Theory Exam : 100 Marks

**Aim:**

To explore the design and form of building typologies that are the result of pressure on urban and economics, technology & ecology

**Objectives:**

- To create an awareness with regard to the design of green buildings and sustainable architecture
- To inculcate the importance of services integration and construction in spatial planning in the context to design of high rise buildings and service intensive buildings
- To highlight on the importance of high rise buildings as elements of identity in urban areas and urban design principles that govern their design
- To explore computer aided presentation techniques including 2D and 3D drawings with walkthroughs and models as required

**Syllabus:**

Scale & Complexity- advanced & complex problems including large scale multistoried buildings & complexes for residential/ commercial/ institutional/ mixed use in an urban context with focus on visual characteristics, service integration and sustainable practices

**Term Work:**

**Office buildings, multi use centre, convention centre, multiplex, corporate complex, health care and hospitality building**

**Display of competence in the application of knowledge gained from the following will be an essential requirement for all the design projects**

**Materials, construction, structures, theory/ fundamentals of Architecture Science and Behavioral Science**

**Books for Reference:**

1. Edward D. Mills: Planning for Architects
2. Time Saver Standards from Building Types

**Subject code no. 322 Architectural Building Construction & Materials VI**

Theory Hours: 02

Term Work : 50 Marks

Studio Hours: 04

Practical Exam : 75 Marks

Total : 06 Per Week

Theory Exam : 100 Marks

Duration- 4 hours

**Aim:**

To provide an understanding of various construction practices and details using teak wood, plywood, aluminium in the nonstructural components of a building

**Objectives:**

- To understand both in detail the methods of construction using teak wood/ plywood for nonstructural components of a building
- To understand both in detail the methods of construction using aluminium for nonstructural components of a building
- To understand about the construction details of swimming pools (Olympic size)
- To understand the reinforcement details of a cantilever balcony in a auditorium & cinema theatre

**Syllabus:****BUILDING CONSTRUCTION**

**Unit I: False Ceilings:** Brief study of teak wood framing, aluminium framing for false ceilings- false ceilings with POP, acoustic boards with teak wood framing, fixing of POP boards/ acoustic boards including light fittings, etc.

False ceiling with aluminium framing with all details, including lighting etc

**Unit II: Aluminium Doors & Windows:** Brief study of aluminium products, market forms of aluminium, aluminium extrusions, sketches of the above

Aluminium doors & windows design details, door- openable, sliding, pivoted and fixed,

windows- openable, sliding, fixed, louvered, ventilators- top hung, pivoted, louvered

**Unit III: Teak wood partitions, aluminium partitions, curtain walling**

Partitions: partly glazed, fully glazed using teak wood members, door fixing details, fixing of teak wood members to flooring & ceiling, fixed partitions, partly glazed & fully glazed partitions, door fixing details

Curtain walling:

Design & construction details using different types of glazing & composite aluminium panels

**Unit IV:** construction of swimming pools with details of retaining walls, raft slab, underwater lighting system, scum gutter, inlet & outlet details, spring board diving details, filtration plant, notes on washing of swimming pools

**Unit V:** construction details of a balcony slab in a auditorium/ cinema theatre, raker beam details & RCC slab details (showing general reinforcement), longitudinal section of an auditorium

**BUILDING MATERIALS**

- Retaining walls, concepts, masonry / RCC retaining walls, weep hole details, RCC/ masonry retaining walls in basement, disposal of water from the basement floor

- Cavity walls, construction, materials, brick masonry walls, detail of cavity wall near door & window openings
- Different materials for curtain walling like glazing, composite aluminium doors, materials used for swimming pools, decks, paving

**Term Work:**

The students should submit drawing sheets covering all the units as given above including detailing wherever required

The students should do case studies of the items as given above & taken to sites of constructions as & when required

**Books for Reference:**

1. Dr. B. C. Punmiya. A text book of Building Construction
2. T. D. Ahuja and G. S. Birde- Fundamentals of Building Construction
3. S. C. Rangwala. Engineering Materials
4. Building Construction by Mackey- All Volumes
5. Building construction by Chudley
6. Barry- Building Construction (All Volumes)

**Subject code no. 323****Theory & Design of Structure- V**

Theory Hours: 04

Term Work: 25 Marks

Studio Hours: Nil

Practical Exam: Nil

Total: 04 Per Week

Theory Exam: 100 Marks

Duration- 3 hours

**Aim:**

The course is structured to teach building structural systems & to make the students understand the theory behind the structural forms but they are not expected to solve numerical problems

**Objectives:**

- To inform the students the building structural systems
- To increase the student's ability to identify the structural forms suitable for architectural expression

**Syllabus:**

**Unit I:** Masonry Piers- stability of masonry walls, principles, design of walls, reinforced masonry, examples

**Unit II:** Types of trusses for different spans, materials used, load distribution, IS code specifications, types of connections

**Unit III:** Introduction to the effect of earthquake on structures- basic principles of construction and materials used, IS code recommendations

**Unit IV:** Relation between structure and architecture, geometry of form & structural function. Aesthetic theories of the expression of structural function in architectural form

**Unit V:** Types of building structural elements, load calculations for different structural elements- load distribution methods, IS code recommendations

**Unit VI:** Structural System Design – fixing up of structural elements for the given plan, size and partition of the same, use of modular co-ordination exercises with different building plans

**Term Work:**

Submissions of files with sketches of different structural forms

**Books for Reference:**

1. Criteria for earthquake design of structures- Bureau of Indian Standards (IS 1893-2000).
2. Code of practice for earthquake design & construction of buildings- Bureau of Indian Standards (IS-4236-1976)
3. Felix Candela- Architecture & Structuralism 1963
4. Lane Allen- Developments in Structural Form- 1975
5. Siejel Curt- Structure & Form in Modern Architecture
6. Criteria for design a steel structure as per IS 800-2007.

**Subject code no. 324****Human Settlement Science**

Theory Hours: 04  
 Studio Hours: Nil  
 Total : 04 Per Week

Term Work : Nil  
 Practical Exam : Nil  
 Theory Exam : 100 Marks  
 Duration- 3 hours

**Aim:**

To provide an overview of the vocabulary of Human Settlements while looking at planning concepts and processes in urban & regional planning and urban renewal

**Objectives:**

- To introduce the students of Human Settlements and the classification of Human Settlements
- To outline the form and structure and illustrating through case studies
- To familiarize the students with modern concepts of settlement planning
- To outline the scope and ---- of urban planning, urban renewal and regional planning and the various plans to be prepared

**Syllabus:**

**Unit I:** Objective, scope and relation with architecture urban & rural settlements, their differences, origin, evolution and growth of settlements, site and situation, major functions of a city, city forming and city's serving functions, the relationship between urban and rural areas, problems faced by a typical city

**Unit II:** Activity pattern & landscape, traffic & road network, density of population, Central Business District of a city, urban nodes, fringe area & suburbs. The problems caused due to slums, internal spatial structure, concentric theory, sector theory, multi nuclear theory, inverse concentric theory

**Unit III:** Pattern of settlements in a region and their major function, the relationship between geographic characteristics of a region, economic activity and culture of the inhabitants, basic principles of regional planning, satellite towns

**Unit IV:** Planning principles of Ebenezer Howard- Garden City movement, Patrick Geddes, Le Corbusier, Saria Y. Merta- Linear City, A. Perry- The neighborhood concepts

**Unit V:** Planning process: Various stages of the planning process with relevant examples, Surveys in planning, physical characteristics, utilities, population, employment and industry, housing, commercial and transportation, land use

**Unit VI:** PLANS: regional plans, master plans, zonal development plan, structure plan and transportation plan, regional plan types and delineation of regions, land use plans, local development plans & their components

**Unit VII:** URBAN PLANNING: Agencies & their function, implication of 74<sup>th</sup> amendments and its objectives, public participations in planning, relevance, methods and criteria for public participation

**Books for Reference:**

1. Urban & regional Planning Principles, Practice & law- Diwan & Kopardikar
2. Town Planning by Bandopadhyay

3. Study of Town, Country Planning by N. K. Gandhi
4. Urban Pattern by Gallian
5. The Cities in History by Lewis Mumford
6. ITPI journals
7. MRTP Act 1966

**Subject code no. 325****Environmental Science & Services IV**

Theory Hours: 04  
 Studio Hours: Nil  
 Total: 04 Per Week

Term Work: Nil  
 Practical Exam: Nil  
 Theory Exam: 100 Marks  
 Duration- 3 hours

**Aim:**

To familiarize the students with building services that support the functioning of a building in the area of internal environment control and fire & security systems

**Objectives:**

- To expose the students to the science behind an air-conditioning & refrigeration
- To familiarize the students with various air- conditioning systems and their applications
- To study the design issues for the selection of various systems & their installation
- To inform the various ways by which fire safety design can be achieved in buildings through passive design

**Syllabus:****Unit I: AIR CONDITIONING: BASIC REFRIGERATION PRINCIPLES**

Thermodynamics- heat, temperature, latent heat of fusion, evaporation, saturation temperature, pressure temperature, relationship for liquid refrigerants, refrigeration cycle components, vapor compression cycle, compressors, evaporators, refrigerant control devices, electric motors, air handling units, cooling towers

**Unit II: AIR CONDITIONING: SYSTEMS & APPLICATIONS**

Air- conditioning systems for small buildings, window types, evaporative cooler, packaged terminal units & through the wall units, split system

System for large buildings- chilled water plant, all air system, variable air volume, all water systems

Configuring/ sizing of mechanical equipments, equipment spaces and sizes for chiller plant, cooling tower, fan room, circulation pumps, pipes, ducts

**Unit III: AIR CONDITIONING: DESIGN ISSUES AND HORIZONTAL DISTRIBUTION SYSTEMS**

Design: criteria for selecting the air conditioning system for large building and energy conservation measures- typical choices for cooling systems for small & large buildings, horizontal distribution of services for large buildings grouped horizontal distribution over central corridors, above ceiling, in floor, raised access floor, horizontal distribution of mechanical services

**Unit IV: FIRE SAFETY: DESIGN AND GENERAL GUIDELINES OF EGRESS DESIGN**

Principles of fire behavior, fire safety design principles, NBC planning considerations in buildings- non combustibile materials, egress systems, Exit, Access distance between exits, exterior corridors, maximum travel distance doors, smoke proof enclosures, general guidelines for egress design for auditoriums, concert hall, theatres, other building types, window egress, accessibility for physically challenged, NBC guidelines for lift lobbies, stairways, ramp design, fire escapes and A/C electrical systems

**Unit V: FIRE SAFETY, FIRE DETECTION AND FIRE FIGHTING INSTALLATION**

Heat, smoke detectors, sprinkler systems, firefighting, pump & water requirement, storage, wet risers, dry risers, fire extinguishers & K cabinets, fire protection systems as CO2 & Halon system, fire alarm system, and Snorkel ladder  
Configuring: sizing and space requirements for firefighting equipments

**Books for Reference:**

1. Air Conditioning & Refrigeration by William Sterms & Julian R. Fellows
2. Fire Safety- National Building Code
3. Air Conditioning & Energy Conservation by F. C. Sherrat
4. Design for fire safety by Andrew M. Bnehanan

**Subject code no. 326****Working Drawing II**

Theory Hours: Nil  
 Studio Hours: 04  
 Total: 04 Per Week

Term Work: 25  
 Practical Exam: 75  
 Theory Exam: Nil

**Aim:**

The focus of the course is to impart skills related to the preparation of working drawings meant for construction work on the site and to improve the students ability of detailing

**Objectives:**

- To impart training in the preparation of working drawings for buildings and incorporating specifications as complementary to the working drawings
- To sensitize the students in preparing finer design details required for building

**Syllabus:**

**Unit I: PREPARATION OF WORKING DRAWINGS:** Suitable scale of drawings, methods of giving dimensions on plans, sections, elevations & other standards

**Unit II: PREPARATION OF PLANS:** site plan with all dimensions, centre line plan, foundation plan, all floor plans (as per the design done in the 5<sup>th</sup> semester), terrace floor plan

**Unit III: ELEVATIONS & SECTIONS:** All side elevations, sections sufficient to explain the scheme (1 section through staircase & 1 section through toilet compulsory)

**Unit IV:** Detail layout (Internal & external) for sanitation & water supply, electrical layout, staircase details including railing & handrail details, kitchen platform details with built in cupboards

**Unit V:** Details of door & windows, joinery details, fitting details

Specifications to support the types of doors & windows used

**Term Work:**

Working drawings of two projects is compulsory, out of which one small residential frame structure and other one of the design project done in the 5<sup>th</sup> semester

**Subject code no. 327****Contemporary Architecture (Seminar)**

Theory Hours: 04

Term Work: 75 marks

Studio Hours: Nil

Practical Exam: Nil

Total: 04 Per Week

Theory Exam: Nil

**Aim:**

To expose the students to the diverse Post Modern Directions in Architecture in the Western world from 1960's onwards as well as the architectural production to the cotemporary periods

**Objectives:**

- To introduce to the context for the critiques of modern Architecture and the evolution of new approaches
- To study in detail the different post modern directions in Archotecture
- To understand the trajectory of Architecture in India from the end of the colonial rule to the contemporary period- Architectural debates associated with Indian- establishment of modern architecture & subsequent quest for Indianess

**Syllabus:**

**Unit I: Brutalism-** Projects of Smithsons & Aldo Van Eyck- writings of Jane Jacobs, Robert Venturi, Aldo Rossi & Christopher Alexander

**Unit II: Conditions of Post Modernism-** various post modern directions in Architecture works of Graves, Venturi, Moore, post modern classicism- idea & works of urbanism- Soleri, Archigram & metabolism, Neo- Rationalism

**Unit III: High Tech Architecture-** works of Sterling, Rogers & Piano- Deconstructivist theory & practice- Eisermann, Zoha Hadid, Gehry, Libeskind, T. Schumi

**Unit IV: Critical Regionalism-** ideas & works of Laurie Baker, Hassan Fathy, Ralph Erskine, Lucin Kroll, Ta-dao Ando, Geoffrey Bawa etc.

**Unit V: Post Independence Architecture in India-** Architectural debates associated with nation formation, early modernist architecture, post independent city planning, Chandigarh & Bhuvaneshwar Influences on Post independence Architects as Achyut Kanvinde, Anant Raje, B. V. Doshi, Charles Correa, Nari Gandhi, Raj Rewal, Hafeez Contractor, Sanjay Puri, Suryakant Patel, Christopher Benninger, etc.

**Term Work:**

The students are expected to analyze the works of any of the architects of post Modernism in Europe & post Independence architects in India. The students should submit a short note on the concepts & give a power point presentation, of the notes collected by them in a book form. The Seminar can be given by a group of five as decided by the teacher concerned

**Books for Reference:**

1. Christopher Alexander- Pattern Language
2. Robert Venturi- Complexity & Contradictions in Architecture
3. Aldo Rossi- The Architecture of the City
4. James Steele- Hassan Fathy
5. Brian Brace Taylor- Geoffrey Bawa
6. Kennet Frampton- Charles Correa
7. William Curtis- Balkrishna Doshi