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.

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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.

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Dr BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

Revised Structure and Syllabus of Second Year Engineering of

ARCHITECTURE THIRD YEAR

EFECTIVE FROM - 2012-13 & ONWARDS

SEMESTER V

Dr. Babasaheb Ambedkar Marathwada University,
Aurangabad

Syllabus for Third Year Architecture Course (Part I)

Teaching Scheme					Examination Scheme				
Code No.	**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	--
		15	**21**	**36**	**300**	**300**	**500**	**1100**	

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

Subject code no. 311	**Architectural Design IV**
Theory Hours: Nil	Term Work: 100 Marks
Studio Hours: 10	Practical Exam: 150 Marks
Total: 10 Per Week	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	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 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, revetting & 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, propertiesof 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	Term Work: 25 Marks
Studio Hours: Nil	Practical Exam: Nil
Total : 04 Per Week	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.

Subject code no. 314	History of Architecture-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:

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 Groupius, 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, bunglows, 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: Contemparary 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	Term Work: 25 Marks
Studio Hours: 03	Practical Exam: Nil
Total: 04 Per Week	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

Subject code no. 316	Environmental Sciences & Services-III
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. Lightening 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. Phiips lighting in Architectural Design
2. R. G. Hopkenson & J. D. Kay. The lighting of Buildings
3. National Building Code
4. Benjamin Evaus- 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 theoritical 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)

Teaching Scheme				Examination Scheme					
Code No.	**Subject**	**Lecture Hours**	**Studio Hours**	**Total**	**Term Work**	**Pract Exam.**	**Theory Exam.**	**Total Marks**	**Duration**
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	
		18	**18**	**36**	**300**	**200**	**500**	**1000**	

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 aluminiuim products, market forms of aluminium, aluminum 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 forums 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 okf 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 74th 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	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 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 handing 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 ISSSUES 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 SAFTY: DESIGN AND GENERAL GUIDELINES OF EGRESS DESIGN

Principles of fire behavior, fire safety design principles, NBC planning considerations in buildings- non combustible 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 SAFTY, 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	Term Work: 25
Studio Hours: 04	Practical Exam: 75
Total: 04 Per Week	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 5th 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 5th 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 Sterting, 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, erc.

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