M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)
2011 AR 501 ARCHITECTURAL DESIGN – IV
0-0-10 Credits - 5

Introduction

Begins as a continuation of Architectural design III

Objectives

1. Design of Buildings/built environment of more complex nature incorporating – circulation diagram, function, form, structural system, climate, materials and all services like sanitary and water supply, lighting and ventilation fire fighting, acoustics, lifts ,escalators, ramp design etc. Design brief, Case studies: Data collection, documentation and representation of data. Design concept: Graphical and verbal presentation of concept. Study models of class project. Site design. Design evaluation and final drawings.
2. To emphasize the importance and need of Detailing in Design.
3. To create an awareness of Building rules/National Building code of India /other regulations such as cinemas regulation act, CRZ, fire fighting etc.
4. To apply Systems approach through developing design brief and check list for all projects.
5. To develop communication skill and its application in all projects.

Syllabus

a) Major Project 1: Design of a multi storied building including all services, acoustics incorporating circulation diagram, development of concept of design, building bylaws/codes etc. Eg. Commercial buildings, hospitals, star hotels, apartments etc.

b) Minor Project 1: Preparation of municipal drawings of any one of the previous semesters design project

c) Minor Project 2: Short duration (one day or less) Projects to boost imagination/innovation and speedy decision making

References:

1. IS Codes
2. National Building Code
3. Kerala Building Rules
4. SP41 Functional requirements for building other than Industrial Building
5. “Time saver standards”, Callender Etal., Mc Graw Hill
6. Standards for Star Hotels

No University examination. Evaluation conducted as per manual

M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)
2011 AR 502 TOWN PLANNING

0-3-0 Credits -3

Objectives:

To expose the students

- To the field and profession of Town Planning,
- To the history, development and concepts of planning in India and abroad and its relevance and application along with an understanding of settlements.
- To modern day planning process and issues with special focus on planning in developing countries.

Module 1

Development of Town planning in the historical perspective .Origin and evolution of Human settlements- -Town planning in ancient, medieval, renaissance, industrial & post industrial age-Town planning in India -ancient, medieval, colonial and modern, Definition of town- their classifications.-model towns, garden cities, satellite town. suburb, green belts, Neighbourhoods-Characteristics of modern towns.

Module II

Contributions to modern town planning thoughts by-Patric geddes, Ebenezer Howard, Constantino A. Doxiadis, Lewis Mumford, Le-Corbusier and Clarence Stein. Urban Development Planning system and process-Perspective Plan, Development Plan, Annual Plan, Plan Schemes and Projects. Master plan, Land use Plan, Tools for land use control -Zoning regulations, building byelaws, Subdivision regulations, Plot reconstitution and Betterment Tax.

Module III

Need for town planning legislation-Different town planning acts- Role of development authorities-Role of town planning departments, Role of local bodies in the implementation of town plan. Land Acquisition Act. Coastal Regulation Zones and its relevance.-Contemporary urban problems, growth and changes. Need for sustainable city planning

Text Books

1. Arthur B.Gallion, " Urban Pattern",
2. Keeble Lewis , Principls and Practice of Town Planning
3. Kevin Lynch , Image of the city
4. AEJ Morris ,History of Urban Form

Reference

1. C.L. Doxiadis, Ekistics: An Introduction to town and Country planning
2. Peter Hall , Urban and Regional Planning
3. Peter Hall &Ulrich Pfeiffer ,Urban Future 21
4. Ministry of Urban Affairs Govt. of India- Urban Development Plans Formulation and Implementation Guidelines
5. John Ratcliffe Introduction to Town and Country Planning

University Examination Pattern

PART-A

8 short questions 5 marks each from all modules, 40 marks

3 questions of 10 marks each from Module I, II & III, with choice to answer any two – 20 Marks

PART B

3 questions of 20 marks each from Module I, II, & III with choice to answer any two – 40 Marks

M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)
2011AR 503 History of Architecture-IV
0-2-0 Credits - 2

Objectives

- To introduce architectural vocabulary and provide an understanding of various architectural styles and their salient features.
- To trace the developments in construction techniques and to illustrate the role of technology on architectural form.
- To create an understanding and appreciation of visual aspects and principles of architectural design-spatial organization, composition, scale, proportion etc

Module I

Industrial revolution-Influence of new material and techniques, new types of building, influence of technology- Chicago school, Art movements-Art Nouveau, , Eclectism. Peter Behrens, Antonio Gaudi, Victor Horta, Louis Sullivans, Frank Lloyd Wright, Organic Architecture, European Modern Architecture, Auguste Peret, Adolf Loos.

Module II

Modernism, metabolism, Archigram, Brutelism, Post Modernism, De-constructivism- geodestic dome, Fransworth House, Gugggenheim Museum, Ronchamp chapel, TWA terminal, Sydney Opera House, Chandigarh, IIM Ahmedabad (works of modern architects till date)

Module III

Influence of other visual arts on Architecture, Bauhaus School, Walter Gropius, Erich Mendelson, Mies Van Der Rohe, Le corbusier, Alvar Aalto, Gio Ponti, Peir Luigi Nervi,, Philip Johnson, Eero Saarinen, Oscar Niemeyer, Kenzo Tange, Jorn Utzon,, B.V Doshi, Charles Correa, Geoffrey Bawa, etc-Post modern Architecture- Peter Eisenman, Frank Gehry, Zaha Hadid, Coop Himmelblau, Rem Koolhaas, Daniel Libeskind, and Bernard Tschumi

University Examination Pattern

PART-A

8 short questions 5 marks each from all modules, 40 marks

3 questions of 10 marks each from Module I, II & III, with choice to answer any two – 20 Marks

PART B

3 questions of 20 marks each from Module I, II, & III with choice to answer any two – 40 Marks

M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)
2011 AR 504 STRUCTURAL DESIGN IV
0-3-0 Credits-2

Objectives

- To give an introduction to the design concepts of RCC structures and different structural elements
- To make the student familiar with code provisions
- To equip students to design simple RCC structures
- To equip the students to understand advances in the field of Concrete Structures,

Module I

Design of beams : behaviour of R.C.C beams

Working stress method – Introduction - permissible stresses-factor of safety —assumptions – basic concepts of under reinforced –over reinforced and balanced sections - Theory of singly and doubly reinforced beams – Emphasis on the implication of the design on form.

Limit state method: Concepts-assumptions –characteristic strength and load partial safety factors-limit states-limit state of collapse –limit state of serviceability. Theory of singly and doubly reinforced rectangular sections in flexure-design of simply supported and flanged beams - Emphasis on the implication of the design on form.

Module II

Design of slabs: Behaviour of slabs - design of one way and two way slabs – design of filler slabs - Continuous slabs-analysis using method recommended by BIS – Design of forms of different type of slabs - Design of flat slab (Concept only).

Module III

Design of columns: Limit state method- I S specifications-design of columns – proportioning of columns.

Stair cases- introduction to different types-design of stair configuration.

Introduction to prestressed construction: Prefabrication. Modular coordination. Earthquake resistant structures, detailing including the joint detailing, Basic concepts of pre-stressed concrete-pre-stressing systems, materials, behavior of pre-stressed concrete beams and losses in pre-stress. (study only)

References:

1. Relevant IS codes. (I.S 456, I.S 875, SP 16)
2. Park R and Pauloy T, Reinforced concrete structures, John Wiely & sons Inc.
3. Purushothaman P, Reinforced concrete structural elements-Behaviour, Analysis and Design, Tata McGraw Hill publishing company Ltd.
4. Unnikrishna Pillai S. & D. Menon, Reinforced concrete design, Tata McGraw Hill Publishing company Ltd.
5. Mallick S.K., Reinforced concrete, Oxford & IBH Publishing company.
6. Varghese P.C., Limit state design of Reinforced concrete, Prentice Hall of India Pvt Ltd.
7. Ashok .K. Jain, Reinforced concrete- Limit state design, New Chand & Bose.
8. S.S Bhavikatti, Design of Reinforced concrete structures, I.K.International Publishing house Pvt.Ltd

University Examination Pattern

PART-A

8 short questions 5 marks each from all modules, 40 marks

3 questions of 10 marks each from Module I, II & III, with choice to answer any two – 20 Marks

PART B

3 questions of 20 marks each from Module I, II, & III with choice to answer any two – 40 Marks

M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)
2011 AR 505 INTERIOR DESIGN
3-1-0 Credits-4

Objective

The objective is to introduce Interior Architecture as the essence of Architecture which is primarily about organizing effective and aesthetic spaces for human beings. Unlike the popular notion of being relevant only as a luxury science and more for aesthetics, the subject should be presented as a discipline with a holistic mission to enhance the quality of spaces and life. The potential of the subject to be a discipline in its own right and a popular sought after service should be addressed. At the end of the semester a good understanding about its important aspects and confidence to address enquiries of small and medium scale projects independent or in connection with general architectural projects is what is envisaged.

Module 1

- **Elements of visual composition**

Dots, Lines, Forms, Spaces, Columns, Texture, Light, Shade, Planes, Patterns, Levels, Fenestrations

- **Principles of visual composition**

Unity, Rhythm, Repetition, Balance- geometrical and asymmetrical, Direction, Radiation, Harmony etc.

- **Interior spaces** – Definitions in relation to Architecture, Landscape etc.
  i) Basic components of Interior Spaces
  Back ground, Foreground and Various facilitating services

Design/ Drawings Hours

Design minimum one the following

- TV Studio- News Room CNN
- Reality Show Stage - Minute to win it
- A Boutique Hotel Lobby- Taj Ginger
- Conference room for Nike.

Module – II

- Elements of Background.
  i) Understanding and treating
  Floors, Walls, Openings and Ceilings.

- Elements of Foreground.
  i) How to set Interior Spaces
  Furniture, Furnishings, Accessories, Artifacts

Furniture Design - Basics Concept to detailed drawing

Design/ Drawings Hours

- Design the Interior of a modern apartment (or a small residence) from their own previous years Residential Project Designs.
- Design one interesting furniture for the above in 1:10 or bigger scale to detail out materials, joinery and finishes with specifications.

Module – III

Services in Interiors

i) Lighting ii) Electrical – LAN iii) Electronic Security
iv) Air Condition v) Plumbing vi) Fire Fighting

- History of Interior Design- Periods and styles an overview.
- Modern trends and styles in Interior Design -Open concept, contemporary, minimalism, Landscape driven, etc

Design/ Drawings Hours

- Design a Commercial interior of medium complexity (preferably one of their projects already done in previous years.) like a restaurant
- Working drawings for the above complete with details of all services in a relevant drawing format.

CONCLUDING NOTE

Lectures:

Lectures should interestingly and creatively introduce the basics of the subject. Guest lecturers with audio - visuals presentation can be very effective.

Design Projects:

Design Projects be done in relation with earlier or parallel architectural design exercises with real sites and strong design briefs. Expressions in visual composition using any one of the element to bring out random concepts like ‘corporate, rain, harmony,’ etc. Elements and concepts can be split amongst students to explore the possibilities and potential to maximum extend.

Emphasis is on the treatment of each of the background elements - walls, floors, ceiling and openings of the space exercising knowledge of the elements of visual composition and principles to bring forth the philosophy concept suitable to each company. Mood board at concept stage, Graphics and Signage proposal for the above space.

Importance to be rotated amongst design concepts, mood boards, attractive presentation drawings, material choices and detailing etc in different project submissions can give individual/ group projects.

Reference Books

- Francis D.K.Ching, Interior Design Illustrated, V.N.R. Pub. NY 1987
- Joseph DeChiara, Julius Panero, Martin Zelnik, Time Saver's Standards for Interior Design,McGraw-Hill Professional
- John F.Pile, Interior Design, John Wiley and Sons
- Steport - De - Van Kness, Logan and Szebely, Introduction to Interior Design, Macmillan Publishing Co NY
- Architecture of Happiness - Alain de Button

No university examination evaluation as per manual

M G UNIVERSITY

B. ARCH COURSE - FIFTH SEMESTER (S5)

2011 AR**2011 AR 506 ARCHITECTURAL ACOUSTICS**

0-2-0 Credits-2

Objective:

To provide an introduction to architectural acoustics through basic studies of sound and its behavior in architectural spaces. To generate an awareness to the impact of noise on human activity spaces.

Module I

Nature of sound- Properties of sound-pure tones, over tones, frequency, wavelength, velocity of sound. Audible frequency ranges –units-Decibels. Sound pressure and sound intensity. Measurements -sound level meters.

Module II

Behavior of sound in rooms- Sound reflection, sound diffusion and diffraction. Room shapes, room resonance. Requirement for good acoustics – Reverberation- Optimum reverberation time, calculation of reverberation time, Sabine's formula, Eyring's formula. Acoustical defects in enclosed spaces.

Noise sources - Effect of noise in human being- air borne and structure borne noise , Noise criteria curves, noise levels- Transmission loss- Noise control.

Module III

Acoustical materials: Sound absorption coefficient- Efficiency of sound absorbers- sound absorbing materials, porous and non- porous materials, pre -fabricated units, acoustical plasters, acoustical tiles, acoustical blankets.

Acoustical design of buildings- auditoriums, Room for music, classrooms multipurpose rooms, studios and open-air theaters. Acoustical correction to the existing spaces.

Text Books

1. Lawerence E Kinsler, Austin R.Frey, `Fundamentals of Acoustics'
2. Knudson and Harris, `Acoustical Designing to Architecture'.

References

1.David Egan, `Architectural Acoustics' Ross publishers, 2008.

2.Ducan Templeton et all 'Acoustics in the Built Environment, Architectural press1997

University Examination Pattern

PART-A

8 short questions 5 marks each from all modules, 40 marks

3 questions of 10 marks each from Module I, II & III, with choice to answer any two – 20 Marks

PART B

3 questions of 20 marks each from Module I, II, & III with choice to answer any two – 40 Marks

M G UNIVERSITY
B. ARCH COURSE - FIFTH SEMESTER (S5)

2011 AR 507 BUILDING SERVICES-II
0-2-0 Credits-2

PART –A

HVAC

Objective:

To provide the basic knowledge of heating, ventilation and air conditioning in building.

Module I

Indoor Air Parameters & Psychometrics
Temperature, Humidity, Air quality, Basic Psychometrics
Indoor Design Conditions & Comfort Zones as per ASHRAE

Basic Heat load
External Factors contributing to heat load in an enclosed space, internal parameters contributing to heat load, Thermal conductivity of commonly used building materials
Heat load Estimation, Methods of reduction of heat load inside an enclosed space, Solar Orientation
Building materials with Low thermal conductivity

Basic Air Conditioning System
Basic refrigeration cycle & Schematic of an Air conditioning System, Basic components of an Air conditioning System- Evaporator, Compressor, Condenser
Standard Refrigerants & Properties, Plant Room/AHU room & Service Trap door concepts, Drain Piping & Termination

Module II

Types of Air-conditioning Systems & Applications
Room Air conditioner (Split / Window Air conditioners), DX Type Ducted Air conditioners, Air cooled & Water cooled Air conditioning systems, Chilled Water Systems, Variable Refrigerant Volume / Flow Systems, Precision Application Air conditioners (Equipment Cooling)

Air Side
Basic Air Duct Design & Principles, Air Duct Routing Concept of return air
Thermal, Acoustic & roof insulation, Fresh Air, Exhaust & Ventilation

Modern Trends in HVAC
Energy efficient systems, CFC free refrigerants, Thermal Storages, Green building & Net Zero Building concepts

Text books

1. Manohar Prasad, 'Refrigeration & Air conditioning'
2. C.P. Arora, 'Refrigeration & Air conditioning'

REFERENCES

1. Basics of Air conditioning by ISHRAE
2. All about Insulation by ISHRAE
3. ISHRAE HVAC Handbook 1997 Part - 1 -Air Conditioning
4. ISHRAE HVAC Handbook 2004 Industrial Ventilation Applications
5. ISHRAE The Hand Book on Green Practices

Note: Site Visit of different construction stages of Air conditioning systems shall be incorporated and students shall submit a report as part of their field study. Classes with expert faculty from the subject field shall be included.

PART –B
LIGHTING

Objective:

To provide the basic knowledge of electrical services and basic concept of illumination in architectural design

Module III

Fundamentals of electrical Engineering: Faraday's law, Lenz's law, statically and dynamically induced emf, self and mutual induction. Alternating current: Generation of single phase and three phase sinusoidal voltage, RMS Value, Average Value, Power factor. Star connected and delta connected system. Concept of balanced and unbalanced loads in three phase system. Classification of voltage, electrical services in buildings. General aspects of design of electrical installation in residential buildings. Electrical safety: Necessity of earthing, pipe and plate earthing, lightning protection in buildings.

Module IV

Basic principles and definitions of Illumination: laws of illuminations, units of lighting, light in the electromagnetic spectrum, optical performance, color temperature, color rendering index, efficacy. Light sources and basic types of lamps and luminaries, different types of lighting arrangements. Design consideration of good lighting scheme, Energy-efficient lighting systems. Basic design technique- determination of quantity: point by point method, lumen method, light loss factor. Determination of quality: visual comfort probability. General illumination design: residential lighting, street lighting, industrial lighting, office lighting, departmental stores lighting, indoor stadium lighting, theater lighting, street lighting and lighting for displays.

Text Books

1. Edward Hughes, 'Electrical and Electronic Technology', Pearson Education.
2. K B Raina, S K Bhattacharya, 'Electrical Design Estimating and Costing', Willy Eastern Limited.

References

1. Prafulla C Sorcar P E, ' Energy Saving Lighting Systems' Van No strand Reinholod Company.
2. National Electrical Code 1985. Bureau of Indian standards.
3. Light Right- A Practicing Engineer's Manual on Energy – Efficient Lighting, THRI Press-2005.
4. M K Giridharan 'Electrical System Design-Data handbook'

University Examination Pattern

(Separate answer book shall be provided for Part –A and Part-B. Part –A shall be collected after 1½ hrs and Part-B shall be collected at the end of 3rd hr)

PART -A

Q1 . 4 short answer questions of 5 marks, from I & II modules.
QII . 2 questions A and B of 15 marks each of Modules I with choice to answer any one
Q111. 2 questions A and B of 15 marks of Module II with choice to answer any one

PART –B

Q1. 4 short answer questions of 5 marks, from III & IV modules.
QII. 2 questions A and B of 15 marks of Module III with choice to answer any one
Q111. 2 questions A and B of 15 marks of Module IV with choice to answer any one

M G UNIVERSITY

B. ARCH COURSE - FIFTH SEMESTER (S5)

2011 AR 508 ESTIMATING, COSTING AND SPECIFICATION

3-0-0 Credits- 2

Objectives:

- To enable the students to prepare detailed and approximate estimate and to have a clear picture of the project expenditure.
- To enable the students to have a thorough idea regarding the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.

Module I

Types of Estimate: Introduction, Types of estimates, detailed estimate, revised estimate, supplementary estimate, maintenance estimate, approximate estimate. Explanation of terms- Contingencies, work charged establishments, provisional sum, lump sum item. Introduction to plinth area method, cubic rate method, unit rate method and bay method.

Module II

Building Cost Analysis: Introduction to building cost modeling-traditional cost models-single price estimating by area method and the spatial method-cost related to elements, operations and resources. Classification of cost models-casual or empirical models-regression models.

Cost parameters of the building – building shape, height, enveloping area, structural elements, services, finishes, architectural features- initial cost and maintenance cost-comparison of building's cost with type of building cost escalation with time-cost index of building operations.

Module III

Quantity Surveying: Methods of building estimate-centre line method and long wall- short wall method. Analysis of rates for main items of work in buildings, considering current market rates for building materials, labour wages, plants and tools, transportation, handling, storage and contractors profit.

Preparations of Detailed estimate (Details of measurements and calculation of quantities & Abstract of estimated cost) for simple buildings of load bearing walls and framed construction.

Reference Books

1. Dutta B.M.: Estimating and costing in civil engineering
2. D.J. Perry and P.S. Barden: Cost planning of building (Collins, London)
3. Parks: Valuation of real property (Eastern Law Book House , Calcutta)
4. Rangawala S.C.:Valuation of real properties (Charotar Publications)

University Examination Pattern

PART-A

8 short questions 5 marks each from all modules, 40 marks

3 questions of 10 marks each from Module I, II & III, with choice to answer any two – 20 Marks

PART B

3 questions of 20 marks each from Module I, II, & III with choice to answer any two – 40 Marks