M G UNIVERSITY

B. ARCH COURSE - THIRD SEMESTER (S3)

2011 AR 301 ARCHITECTURAL DESIGN – II

0-0-10 Credits-5

INTRODUCTION

Begins as a continuation of Architectural design I

OBJECTIVES

1. To equip the students to design buildings / built environment (single / multi space)of simple nature emphasizing the importance of process of design through conceptual development. Understanding of project briefs, site analysis, circulation diagram, function and form and their correlations, structural system, climate, materials, incorporating ideas of vertical and horizontal interconnection of spaces and services especially sanitary and water supply, natural lighting and ventilation etc.
2. Conduct Case studies, Data collection to understand the project.
3. To learn about the importance of detailing in Architectural Design.
4. Awareness of Building rules/National Building code of India /other regulations applicable for the site selected.
5. Development of Presentation and communication skills.

SYLLABUS

a) Major Project 1: Design of simple buildings such as day care centre, nursery school, clinic, weekend cottage or buildings of similar scale and nature incorporating circulation diagram, development of concept of design.

b) Minor Project 1: Architectural appraisal/ appreciation of architectural elements/ building. Preparation of a report covering analysis, documentation, inferences and conclusion.

c) Minor Project 2: Short duration (one week) Projects to boost the imagination/innovation and speedy decision making- such as Design of kiosk/bus shelter/exhibition pavilion/, saloon, internet cafe or other buildings/ spaces of similar nature etc.

REFERENCES:

1. Human Dimensions and interior spaces, Julius Panero and Zelnik.
2. Living in small spaces, Campos, Cristian, Loft Publications, Barcelona, 2008
3. Architecture in Indian sub continent, Bakshi, S R, Vista international publishing house, Delhi, 2008
4. Time saver standards for housing and residential development, De Chaira, Joseph,Ed, et al., Tata McGraw Hill Education Pvt. Ltd., New Delhi 1995
5. Neufert's Architect's data

No University examination. Evaluation conducted as per manual

M G UNIVERSITY

B. ARCH COURSE - THIRD SEMESTER (S3)

2011 AR 302 BUILDING MATERIALS AND CONSTRUCTION – II

1-0-3 Credits-4

Objectives

- Understanding of materials, basic principles of construction and elements of building through theory and drawing
- To give adequate knowledge about building foundations.
- Understanding of building materials like Steel & Aluminium products and paints.

Module I

Soils – Their classification, physical properties and behaviour – Bearing capacity, safe bearing capacity, Determination of SBC, Standard Penetration test – Sand – fineness, bulking qualities - Methods of improving bearing capacity.
Shallow Foundations – Types- Pad, Strip, Raft-Method of construction.
Deep Foundations-Types- Piles, Piers, Caissons-Materials and method of construction.
Execution problems in loose and clayey soil, Shoring, Timbering.
Drawings – Raft foundation, Pile Foundation, Well Foundation.

Module II

Metals and metal products as building material :
Steel – Composition, Properties, anticorrosive measures, mechanical and heat treatment of steel - Market forms of steel : Steel for Reinforcement - Hot rolled bars, CTD Bars, TMT bars , Welded wire fabrics; Steel for Pre stressed concrete; Structural steel; Stainless steel and steel alloys.

Other metals : Aluminium and its alloys, copper and its alloys
Paints, distempers & varnishes – types –composition – properties – environmental, climatological and durability spects - application– Uses –BIS specifications- Covering capacity, method of distempering wall surfaces, and painting of timber and iron work

Module III

Steel doors and windows – Standard sections – Channel, box, extruded etc. – Connections – Specifications
Aluminium doors and windows – Standard sections – Connections and specifications.
Door and window fittings – Door and window hinges like butt hinges, pin hinges, parliament hinges, garnet hinges, counter flap hinges, strap hinges, piano hinges, auto-closing hinges - Door and window bolts like sliding door bolt, tower bolt, flush bolt – door handles- door locks-other fastenings to door and windows like hook and eyes, window stays, door stoppers, door closers, caster wheels, floor springs, pivots, magnetic catchers for wooden cupboards etc.
Drawings – Steel windows and doors, Aluminum doors, windows and hand rails, Door and window fittings.

References:

1. M.S.Shetty, 'Concrete Technology', S.Chand & Co.ltd, New Delhi, 1986.
2. S.C.Rangwala, 'Engineering Materials', Charotar Publishing House, India, 1997.
3. Dr.B.C.Punmia, 'Building Construction', Laxmi Publications Pvt.Ltd., New Delhi, 1993.
4. P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
5. Arthur Lyons – 'Materials for Architects and Builders' - An introduction Arnold, London,1997.
6. W.B.Mckay, 'Building Construction', Longmans, UK, 1981.
7. Francis D.K.Ching, 'Building Construction Illustrated' VNR.1975.
8. Ramachandra S., 'Design of Steel Structures', Standard Book House, Delhi, 1984.
9. Relevant BIS Code Pertaining to Materials of Construction

University Examination Pattern

There will be three sections A, B &C

A section will have 8 short questions of 5 marks, from all modules - There will not be any choice **(8 X 5 = 40)**

B section There will be three questions of 10 marks from each module of which 2 questions are to be answered. **(15 X 2=30)**

C section (Drawings) Two drawing questions of 30 marks of which one question is to be answered. **(30 marks)**

M G UNIVERSITY
B. ARCH COURSE - THIRD SEMESTER (S3)
2011 AR 303 History of Architecture-II
0-2-0 Credits-2

Objectives

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

Module-1

Romanesque and Byzantine -the medieval ages - learning in the monasteries, evolution of the guilds - Factors influencing architecture -outline of architectural character in Italy, France and England - Examples: Pisa group,Italy; Abbay Aux Hommes, Tower of London. Gothic -origin -religious and social influence - evolution of vaulting and development of structural systems - outline of Architectural character - Examples: Notre Dame, Paris. Development of English gothic vaulting - outline of Architectural character in England and Italy - Examples: Westminster Abbey Hampton Court Palace,London; Doges Palace, Venice ;Milan Cathedral. Renaissance- revival of art - sociological influences in art and architecture - Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods – contribution of masters- Brunelleschi, Mischaelangelo, Andrea Palladio. Philosophy and works of Sir Christopher Wren, Inigo Jones.

Module-2

Hinayana and Mahayana Buddhism - Interaction of Hellenic & Indian Ideas in Northern India - Architectural development during Ashoka's rule - Ashokan Pillar, Sarnath, Rock cut caves at Barabar, Sanchi Stupa. Salient features of a Chaitya hall and Vihara, Rock cut architecture in the western and Eastern ghats - Karli, Viharas at Nasik, Rani gumpha, Udaigiri. Takti Bhai, Gandhara.
Indo Aryan style; North-Central Indian temples of Khajaraho; Eastern Indian temples of Orissa; Later Chalukyan and Hoysala style-Dravidian culture - Rock cut productions under Pallavas - Shore Temple, Mahaballipuram - Dravidian Order -Brihadeeswara Temple, Tanjore - Evolution and form of Gopuram - Complexity in temple plan due to complexity in Ritual - Minakshi Temple, Madurai. South central Indian temples of Deccan. Evolution of Hindu Temple - Early shrines of the Gupta and Chalukyan periods - Tigawa Temple, Ladh Khan and Durga Temple, Aihol, Papanatha and Virupaksha Temples,Pattadakal

Module-3

Islamic architecture under Imperial style: Slave, Khalji, Tughlak, Sayyid, Lodi and Sher Shah Sur- Minarets, Tomb, Mosques in Afghanistan, Delhi and Sasaram;

Text Books

1. Architecture of the Islamic World - George Michell - (its history and social meaning),
2. Thames and Hudson,London,1978.
3. Islamic Architecture, Form, Function and Meaning, Robbert Hillenbrand, Edinburgh University Press,1994.
4. Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons,Bombay, 1983.
5. Satish Grover, The Architecture of India (Islamic) Vikas Publishing House Pvt.Ltd. New Delhi,1981.

References:

1. Christopher Tadgell - The History of Architecture in India - Penguin Books (India) Ltd., New Delhi,1990.
2. A. Volwahsen, Living Architecture - India (Buddhist and Hindu),Oxford and IBM, London,1969.
3. Christoper Tadgelli, The History of Architecture in India from the Dawn of Civilization to the end of Raj, Longman Group, U.K.Ltd., London, 1990.
4. Carmen Kagal,Vistara: The Architecture of India, Published by Festival of India, 1986.
5. Electa Moniteur, Architecture in India,M/s.Electa France,Milan,1985.
6. George Mitchell, The Hindu Temple, BI Pub., Bombay, 1977.

University Examination Pattern

There will be two sections A & B

A section will have 8 short questions of 5 marks, from all modules - There will not be any choice

8 X 5 = 40

B section will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered

20 X 3 = 60

M G UNIVERSITY

B. ARCH COURSE - THIRD SEMESTER (S3)
2011 AR 304 STRUCTURAL DESIGN – II
0-2-0 Credits-2

OBJECTIVE

- To give an introduction to the basic principles governing structural systems.

Module I

Elastic Constants- Elastic constants, Rigidity Modulus, Poisson's Ratio, Bulk Modulus and Shear Modulus. Relations-Modulus of Elasticity and Modulus of Rigidity. Application to uniform sections - Strain strain behavior of elastic materials, plastic materials and brittle materials (concrete, brick, steel, glass, aluminium, plastics and various building composites)

Axial stresses - Bars of varying cross section - Deformation due to self weight – Bars of uniform strength - Temperature stresses – Composite members – equilibrium & compatibility conditions.

Module II

Torsion – Concept of torsion in beams, torsion equation, torsional stresses in simple sections.- behaviour of structural members experiencing stresses due to axial thrust, bending and torsion (concepts only) - shear centre (concept only).

Compound stresses: Two dimensional problems-normal & tangential stresses on an inclined plane - principal stresses and planes-maximum shear stresses & planes – Analytical & Mohr's circle methods – applications in load bearing walls

Columns and Struts – Long and short columns - Effective length, critical load, slenderness ratio, Euler's equation for different end conditions. Combined bending and direct stresses in short columns.

Module III

Deflection computation: Slope and deflections of Cantilever, simply supported and overhang beam for different load conditions using Double Integration method and Macaualay's method - Moment Area method for simple case of loading - Shear deformation (basic concepts only)

References:

1. Timoshenko.S.P, Strength of Materials, Part-1, D. Van Nostrand company, Inc. Newyork.
2. Nag&Chanda, Fundamentals of Strength of Materials, Wiley India Pvt. Ltd.
3. Bansal R.K., Strength of Materials, Lakshmi Publications, New Delhi.
4. Bhavikatti S.S , Strength of Materials, Vikas Publishing House (P) Ltd.
5. D.S. Prakash Rao, Strength of Materials, Vol. I, University Press (India) Ltd.
6. Popov E.P., Engineering Mechanics of solids, Prentice Hall of India, New Delhi.
7. Punmia B.C, Strength of Materials and Mechanics of structures, Vol.1, Lakshmi Publications, New Delhi.
8. Vazirani V.N., Ratwani N. M., Analysis of Structures, Vol.1, Khanna Publishers, New Delhi.
9. Kazimi S.M.A., Solid Mechanics, Tata Mc Graw Hill.
10. Singh, Mechanics of Solids, , Prentice Hall of India, New Delhi.
11. Arthur Morley, Strength of Materials, ELBS, Longman' s Green& Company.

University Examination Pattern

There will be two sections A & B

A section will have 8 short questions of 5 marks, from all modules - There will not be any choice

8 X 5 = 40

B section will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered

20 X 3 = 60

M G UNIVERSITY
B. ARCH COURSE - THIRD SEMESTER (S3)

2011 AR 305 COMPUTER APPLICATION IN ARCHITECTURE-I
0-0-3 Credits-2

Objective:
To familiarize students to computer based representations and to impart necessary skills for using graphic software and creating two dimensional composition and drawings

Module I

Introduction to the advancements in the field of computer application in Architecture, Information technology and network concepts- Computer as a design medium. Applications and limitations of computer in Architecture.
Concept of Computer aided drafting – Conventional drafting and CAD- Brief overview of related software. Units of a CAD workstation, their operation and critical parameters. General concepts of building geometry and typology,

Module II

Introduction to Graphics Software – Painting, drawing and image editing using Photoshop, Paint shop, Corel Draw, Power Point and Illustrator.

Module III

Creating two dimensional composition and drawings-

Controlling various CAD software environment – creating two dimensional drawings and editing commands. Coordinate space and metric, Geometric, Primitive and Symbols, Object properties. Basic transformations absolute and referential, Editing, Segmentation by colour, layering and grouping.
Organizing drawings with layers – Advanced geometry editing & using blocks inquiry tools – CAD-design center. Text annotation – Creating hatch patterns - dimensioning Plotting slide presentation &. Importing /exporting files.

Text books

1. Mitchell, 'Computer Aided Architectural Design', Van Nostrand
2.Omusa, George – Advanced techniques n AutoCAD

References

1.DH Sanders, 'Computers Today' Mc Graw Hill
2.Omura George, "Mastering AutoCAD, BPB Publications, New Delhi,
3.Bain – Using Corel Draw

4.Adele and Seth Green Berg – Fundamental Photoshop 5.5.

University Examination Pattern

Practical examination of 4 Hrs duration is to be conducted

M G UNIVERSITY
B. ARCH COURSE - THIRD SEMESTER (S3)
2011 AR 306 BUILDING CLIMATOLOGY

0-3-0 Credits-3

Objectives:

1. To introduce global climate and climatic data required for a building designer
2. To understand human response to various climate and comfort criteria
3. To understand day lighting and ventilation design standards and principles
4. To understand design principles for climate responsive architecture

Module 1 (16 Hours)

Climate and weather - earth's rotation – seasonal variations – geographic latitude, longitude, altitude and azimuth angles declination- -thermal balance of earth – imbalance – global winds, Geometry of solar movement sun path diagram- solar envelope-altitude & azimuth angles. Sunpath diagram/Solar chart- scales of climate -macro-climate, meso-climate and micro climate, site climate

Elements of climate – temperature, humidity, precipitation, radiation, wind- climatic data measurements and representation, tropical Climate -classification and characteristics of tropical climate, - Climatic Zones of India & their characteristics. Climatic design recommendations for various climatic zones in India.

Module 1I (16 Hours)

Thermal comfort- Indices of thermal comfort - Tropical Summer Index- Effective Temperature. Thermal effects in buildings. Basic concepts of heat transfer in buildings, units & terminology. Human response to various climatic conditions – thermal balance of human body – comfort indices - detailed comfort analysis using Tropical summer index and effective temperature nomogram- superimposing comfort zone on ET isopleth- Heat exchange of buildings – calculation of heat loss and heat gain – Thermal gradients – Periodic heat flow. Design of shading devices- performance evaluation of shading devices.

Module 1II(16Hours)

Day lighting and Natural ventilation

Photometric qualities – Day lighting – day light factor concept. Prediction techniques – Daylight protractor –pepper dot diagram, Daylight design parameters- Daylight design for various occupancies using tables and graphs as given in SP 41. Functions of Ventilation – Factors affecting indoor airflow- airflow around buildings – concepts of ventilation- ventilation design. Air flow/wind movement around and through buildings. Natural ventilation. Mahoney Tables and their application.

Text Book

1. Koenihsberger, etal., "Manual of Tropical Housing & Building: Part I - Climatic Design", Orient Longman, Chennai , 1984.
2. Givoni . B. "Man climate and Architecture"

Reference

1. Evans, Martin, "Housing, Climate and Comfort", The Architectural Press, London, 1980.
2. Konya, Alan, "Design Primer for Hot Climates", The Architectural Press, London, 1984.
3. SP41. Hand Book on functional requirements of building. Bureau of Indian standards.
4. Brown, G.F, 'Sun Wind and Light", John Wiley and Sons 1985

University Examination Pattern

There will be two sections A & B

A section will have 8 short questions of 5 marks, from all modules - There will not be any choice

8 X 5 = 40

B section will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered

20 X 3 = 60

M G UNIVERSITY
B. ARCH COURSE - THIRD SEMESTER (S3)
2011 AR 307 SURVEYING & LEVELLING
0-2-0 Credits-2

OBJECTIVE:

- To develop the knowledge and skills related to surveying and leveling principles and practice

Module I

Surveying – Definition, classification, principles of surveying, character of work, shrunk scale.
Chain Survey – Instruments used, Types of chain, Instruments for ranging. Setting out angles, erecting perpendiculars.
Field Work – Chain triangulation, recording and plotting, errors in survey. Plannimeter and Pentagraph.
Plane table survey – Plane table and accessories. Methods of plane table survey, Radiation, Intersection, traversing and resection, field problems. Setting out.

Module II

Levelling : Principles of leveling; Study of instruments -Temporary adjustments of level, Booking and reduction of levels –Basic ideas on plotting of longitudinal and cross sections, Contouring – Characteristics of contours, direct and indirect methods of contouring, interpolation, uses of contours, setting out works such as centre lines of a building, grade for sewer, centre line of a bridge.

Module III

Theodolite survey**:** Study of instrument, Temporary adjustment of theodolite, Measurement of horizontal and vertical angle, Method of repetition. Field book, Field work of theodelite traversing, Total Station survey, GPS.
The students should be given a practical session of minimum 3 hours duration wherein they prepare a drawing of the surveyed area.

References:

1. Kanetkar and Kulkarni, 'Surveying and Levelling', Vol I, Pune Vidyarthi Griha
2. B.C. Punmia, 'Surveying and Levelling', Vol I and Vol II, Laxmi Publications pvt Ltd
3. Dr. P.B. Shahani, 'Surveying and Levelling', Vol I and Vol II
4. R. Agor, 'Surveying and Levelling', Khanna Publishers
5. S.K.Duggal, 'Surveying', Vol. I, Tata Mc Graw Hill Ltd
6. David Clerk, 'Surveying'

University Examination Pattern

There will be two sections A & B

A section will have 8 short questions of 5 marks, from all modules - There will not be any choice

8 X 5 = 40

B section will have 3 subsections each covering one module. There will be three questions of 10 marks from each module of which 2 questions are to be answered

20 X 3 = 60

M G UNIVERSITY

B. ARCH COURSE - THIRD SEMESTER (S3)

2011 AR 308 DOCUMENTATION OF TRADITIONAL BUILDINGS

0-0-2 Credits-2

OBJECTIVE

Kerala is very rich in heritage buildings spread over the entire area. This course is envisaged to give awareness to the students regarding the design planning, construction technology, materials etc of the traditional buildings.

METHODOLOGY

As per the scheme 2 hours/week is set apart making 28 hours available in one semester. The cumulative 28 hours (one week) have to be made available in one slot of one week (5days)

SYLLUBUS

The planning of the settlement, placing of building its relationship with rituals and cultural activities, (eg. Koothambalam)are to be documented Social and religious relevance of various spaces and structures to be studied and documented. Detailed drawing of building plan elevation section, construction details and other sketches of buildings elements etc. have to be prepared. Photographs have to be taken. Videos can be made. Classes are to be arranged with the help of local sthapathis. Traditional settlement has to be identified by the beginning of the semester and the students should be taken there along with the supervisory teacher. This is a residential project and the students should experience the traditional environment.

SUBMISSION

Report have to be prepared which should include principles of design, site and location plan, details of individual building including plan, elevation, section, sketches of important elements, measured drawings of important feature column, brackets, scripture. Photographs and videos are also to be included.

Final Report has to be prepared compiling the works of the individual students with covering report by the supervisory staff.

EVALUATION

Individual works have to be evaluated during the fieldwork itself on a day today basis and internal marks to be awarded by the supervisory staff. Final presentation of the report and evaluation will be done by the end of the semester Students are to present the individual works done by them and the external marks will be awarded by jury as per Architectural Design II manual.