



Estd. 1916

**VishwavidyanilayaKaryasoudha
Crawford Hall, Mysuru- 570 005**

Dated: 20.06.2017

No.AC.2(S)/486/16-17

NOTIFICATION

Sub: Minor Modification of syllabus for B.Arch. degree course.

Ref: 1. Decision of the Faculty of Science & Technology Meeting held on 03.03.2017.

2. Decision of the Academic Council meeting held on 30.03.2017.

The Board of Studies in School of Planning and Architecture (Graduate) which met on 21.12.2016 has resolved to make some minor modifications in the syllabus of III to VI semester of B.Arch. degree from the academic year 2017-18 as follows.

Sl.No.	Modified Syllabus
1.	Subjects such as Working Drawing to be introduced before the Professional Training starts.
2.	Elective subjects may be introduced along with the thesis in the X semester.
3.	Expert lectures may be organized for some of the additional electives.
4.	Professional practice (theory) subject may be extended to two semesters.
5.	Modified regulations are discussed and approved by BOS.

The Faculty of Science and Technology and the Academic Council at their Meetings held on 03.03.2017 and 30.03.2017 respectively have also approved the above said proposal and the same is notified.

The Modified B.Arch.syllabus is annexed herewith and may be downloaded in the University Website i.e., www.uni-mysore.ac.in.

Draft approved by the Registrar

**Sd/-
Deputy Registrar (Academic)**

To:

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Dean, Faculty of Science & Technology, DOS in Physics, MGM.
3. The Director, School of Planning and Architecture (PG), Manasagangotri, Mysore.
4. The Chairperson of the BOS, School of Planning and Architecture(PG), Manasagangotri, Mysore.
5. The Director, College Development Council, Moulya bhavan, MGM.
6. The Coordinator, Directorate of Online & Outreach program, Parakalamata, MGM.
7. The Deputy/Assistant Registrar/Superintendent, AB and EB, University of Mysore, Mysore.
8. The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
9. Office file.

SEMESTER - III

Subject: ARCHITECTURAL DESIGN II		
Code : ARS 301	Credits : 10	Hours / Week: 10 hrs.
Progressive Marks : 60	Examination Marks : 40	Mode of Exam : Jury

AIM:

This course is intended to provide skills for designing a single use, small span and single-storey buildings.

OBJECTIVE:

To develop abilities in design in the context of user requirements

CONTENTS:

The study of design shall continue with further progress and complexity in aesthetic qualities but with more emphasis on architectural and functional aspects like

- a) Complexity in circulation- and pattern of horizontals as well as vertical movement.
- b) Integration in terms of facilitation, platform, volume, concept and space organization.
- c) Application of basic building materials to evolve a design with their aesthetic appeal, functional quality and elementary structural concepts to evolve specific form.
- d) Climatic consideration for the design, orientation of building on site, simple concepts of sun shading devices, their application in elevations as functional / aesthetic solutions.
- e) Landscape Detail like Importance, exploring & understanding the essence; Detailing process; User analysis; Elements; Functionality & aesthetics; Materials.

TYOLOGY:

Art Gallery, Library, Motel, Cultural Centre, Nursery, Kindergarten, Recreational Club, Guest House, Balwadi, Kindergarten School, Primary Health Centre, Doctor's Clinic, small Cafeteria, Highway Restaurant, Village Post Office, Bank extension counter, Police Station, Architect's Office, Departmental Store, School Gymkhana and Youth Club etc. Site Extent - sloping site upto 8000 m²; Topography - average slope ranging from 1:5 to 1:8.

NOTE:

At least two major exercises and one minor design/time problem should be given.

The final submission shall necessarily include a model for at least one of the two main problems. In end exam which is a viva-voce the students have to present the entire semester work for assessment.

TOTAL – 160hrs

OUTCOME:

Use of standards, handling of space, and application of knowledge gained from other subjects in design.

REFERENCES:

1. Chiara Joseph de and others. Time Savers Standards of Building Types. McGraw – Hill, 1980.
2. Kirk, Paul Hayden and Sternberg, D. Eugene. Doctors Offices and Clinics, 2nd ed. Reinhold Pub., USA, 1960.
3. Neufert, Ernst. Ernst Neufert Architects Data, Granada Pub. Ltd., London, 1970.
4. Pevsner, Nikolaus. A History of Building Types. Thames and Hudson, London, 1976.
5. Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub. Co., New Delhi, 1996.

Subject: BUILDING MATERIALS AND CONSTRUCTION - III		
Code : ART302	Credits : 6	Hours / Week: 6 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs.

AIM:

To introduce to the methods and techniques of construction of doors, windows, stairs and foundation of a building using different materials

OBJECTIVES:

- To understand in detail the methods and techniques of construction of doors and windows using steel and aluminum.
- To understand the functions and construction detailing of special doors and windows
- To introduce construction of building components in Reinforced Cement Concrete and practices pertaining to foundations and staircases.
- To develop an understanding of construction details of staircases with the application of different materials.
- To highlight the current trends and innovations in the usage of glass as a building material.

CONTENTS:

UNIT-I: GLASS AND METALS

9 hrs

Glass various types of glass (plate glass, tinted, decorative, reinforced, laminated glass block, glass murals, partially coloured glass etc.). The properties of glass, fabrication techniques, etching, its applications for exteriors & interiors. Fibre reinforced composite materials and products.

Metals

- i **Ferrous metals** – Characteristics and uses of Wrought Iron, Cast Iron, pig iron, mild steel, stainless steel and casting. Steel-treatment, steel tempering, annealing, normalizing, and case hardening, their objectives and effect on alloy steels. Galvanizing, oxidation and casting of metallic products, corrosion of iron and their prevention. Metallic protective coatings.
- ii **Non-ferrous metals** – Basic idea of important ores, properties and uses of Aluminum, Zinc, Copper, Tin and Lead.

UNIT-II: DOORS AND WINDOWS

24 hrs

Mild steel -doors and windows, Rolling shutters, collapsible doors, revolving doors
Aluminum- doors and windows, sliding door, folding door, sliding and folding door, sliding window, double glazing. PVC & FRP- doors and windows

UNIT-III: RCC CONSTRUCTION

15hrs

Concrete -Types of Concrete and its ingredients, grades of concrete, additives and admixtures, sampling and testing, Grading: importance, fineness modulus, combined aggregate, water cement ratio. Mixing and Curing

Understanding the properties and characteristics of RCC. Its advantages and disadvantages. Cast-in-situ and pre-cast constructional methods in RCC. Understanding the structural components of a typical RCC frame structure with reference to their location, junctions, load transfer and design

Substructure: Detailing of RCC foundations and footings in simple framed buildings – Isolated and combined footing, Raft, pile, mat and grillage foundations.

UNIT-IV: STAIRCASES

18hrs

RCC staircases, Metal staircases and Composite staircases.

UNIT-V: ARCHES, VAULTS AND DOMES

12 hrs

Construction of arches in brick, stone and concrete. Brief study on domes and vaults

Total -78hrs

OUTCOME:

The students come up with submission of drawing plates and gains an understanding of the construction techniques with the help of site visits, material surveys, sample collections, model making and presentations.

TEXT BOOKS:

1. Chudley R. (1998). Construction technology. ELBS England.
2. McKay, G.B. (1972). Building Construction (Metric). Longman, London.
3. Barry, R. The Construction of Buildings Vol.2, 5th ed. East-West Press. New Delhi, 1999.
4. Francis D.K Ching “Building Construction” illustrated, John Willey & Sons, 2008.
5. Alan Blanc, “Stairs, Steps and Ramps”, Butterworth, Heinemann Ltd., 1999.

REFERENCES:

1. Bindra, S P. and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
2. Moxley, R. Mitchell’s Elementary Building Construction, Technical Press Ltd.
3. Rangwala, S.C. Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
4. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.
5. Gurucharan Singh. (1981). Building Construction Engineering. Standard Book House, New Delhi.
6. Foster, Stroud. (1963). Mitchell’s Advanced Building Construction. Allied Publishers Private Limited, Bombay.
7. Dr.T.S.Balagopal Prabhu. (1987). Building Drawing and Detailing. Spades Publishers Pvt. Ltd., Calicut

Subject : HISTORY OF ARCHITECTURE – III		
Code : ART303	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To provide an understanding of the evolution of Early Christian, Byzantine, Romanesque, Gothic and Renaissance Architecture in their various stylistic modes characterized by technology, ornamentation and planning practices.

OBJECTIVES:

- To enlighten the students the evolution of architecture in relation to time with special emphasis to historical, social, religious, political and environmental factors.
- To create an awareness about the planning, construction, function and aesthetics of historical buildings and an appreciation of architectural style as a product of the time, place and culture in the western world.
- To study the building typologies and make the students understand the developments in the construction technology in different periods.
- To gain knowledge of the development of architectural form with reference to technology, style, and character in the Early Christian, Byzantine, Romanesque, Gothic and Renaissance Architecture.

CONTENTS:

UNIT-I: EARLY CHRISTIAN ARCHITECTURE

6hrs

Introduction to Early Christian Architecture, Factors influencing the development of Early Christian Architecture - Geographical, Geological, Climatic, historical, religious, social, political. Characteristic Features, Example: Basilican Churches - St. Clemente, Rome. France and England - Examples: Pisa group, Italy; Abbaye aux Hommes, Caen; Tower of London.

UNIT-II: BYZANTINE ARCHITECTURE

6hrs

Introduction to Early Byzantine Architecture, Factors influencing the development of Byzantine Architecture - Geographical, Geological, Climatic, historical, religious, social, political. Characteristic Features, Examples: St.Sophia, Constantinople.

UNIT-III: ROMANESQUE ARCHITECTURE

9hrs

Introduction to Romanesque Architecture, Factors influencing the development of Romanesque architecture - Geographical, Geological, Climatic, historical, religious, social. Characteristic Features, Examples - Pisa Cathedral, Italy, The Abbey Church, Cluny.

UNIT-IV: GOTHIC ARCHITECTURE

12hrs

Formation and Development of Gothic Architecture, Characteristic Features, Examples - Cathedrals and churches.

French gothic - Religious and social influences - Evolution of vaulting and development of structural systems, Examples: Notre Dame, Paris.

English gothic - Examples: Westminster Abbey, Hampton Court Palace, London; Doges Palace, Venice; Milan Cathedral.

UNIT-V: RENAISSANCE ARCHITECTURE

12hrs

Formation and Development of Renaissance Architecture, Characteristic Features

Italian Renaissance - The idea of rebirth and revival of art - Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace, Example :- Palazzo Ricardi, Study of the contribution of the following architects: Brunelleschi, Michaelangelo, Andrea Palladio, Example - St. Peter Rome, Villa Capra in Vicenza. French and English Renaissance - architectural character in the classical & Rococo period - Example - Chateau de Chambord, Louvre, Paris - Domestic British architecture- Study of the works Sir Christopher Wren & Inigo Jones, Example - St. Paul's Cathedral, London. Banqueting House, Whitehall.

TOTAL – 45hrs

OUTCOME:

A detailed understanding of the subject through historical analysis, group discussion and seminar. Students have to submit assignments, sketches, portfolios, model, etc.

TEXT BOOKS:

1. Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition) 1999.
2. David Watkin "A History of Western Architecture".
3. G.K.Hiraskar, "Great Ages of World Architecture", Dhanpat Rai & Sons, Delhi.
4. Spiro Kostof, "A History of Architecture: Setting and Rituals, Oxford University Press, London, 1985
5. Francis D K Ching "Global History of Architecture"
6. Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
7. Emily Cole "Grammar of Architecture".

REFERENCES:

1. Yarwood, Doreen. A Chronology of Western Architecture. B.T. Batsford Ltd., London, 1987.

2. Schulz, Christian Norberg. Meaning in Western Architecture, 2nd ed. Rizzoli Intl. Pub., New York, 1981.
3. Copplstone, Trewin and Others. World Architecture: An Illustrated History, 11th ed. Hamlyn, London, 1979.
4. Bindoo. D.D, History of Architecture, Milind P Lakshana, Hyderabad – 2006.
5. Wittkaner R Architectural Principles in the Age of Humanism, Chichester :Academy Editions 1998
6. Pier Liugi Nervi, General Editor – History of World Architecture – Series, HARRY N.Abrams, Inc. Pub,New York, 1972.
7. S.Lloyd and H.W.Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986.
8. Spiro Kostof – History of Architecture – Setting and Rituals, Oxford University Press, London, 1985.
9. Gosta, E.Sandsform, Man the Builder, McGraw Hill Book Company, New York, 1980.

Subject : STRUCTURAL ANALYSIS		
Code : ART304	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To impart sound knowledge of strength, behavior of various materials and techniques in the analysis of structures.

OBJECTIVE:

- To determine the stresses in beams and strength of sections by working out problems.
- To understand slopes and deflection in beams.
- To understand the concept of indeterminate structure and its analysis.
- To analyze the different types of Arches.
- To introduce to the different types of concrete and their properties.

CONTENT:

UNIT-I: BENDING STRESSES IN BEAMS. 6hrs

Theory of simple bending, neutral axis, moment of resistance, Section modules. Shear stresses in beams in cross sections.

UNIT-II: DEFLECTION OF BEAMS. 7hrs

Introduction of slope and deflection. Slope and deflection for simply supported and cantilever beam with point load and UDL using double integration method and moment area method.

UNIT-III: ANALYSIS OF INDETERMINATE STRUCTURES. 12hrs

Analysis of fixed beams and portal frames with different loading conditions by moment distribution and kani's method.

UNIT-IV: ANALYSIS OF ARCHES. 7hrs

Determination of horizontal thrust, bending moment and radial shear for three hinged parabolic and segmental arches with supports at same level and different levels.

UNIT-V: CONCRETE TECHNOLOGY. 10hrs

Different types of cements and concrete, Properties of concrete ingredients, Properties of hardened concrete – Durability of Concrete - High Strength Concrete, High Performance Concrete, Self Compacting Concrete, Fiber Reinforced, Polymer Concrete , Admixtures. Concrete mix design using IS 10262: 2009.

TOTAL: 42 hrs

OUTCOMES:

At the end of the course, the student should be able to:

- Apply the concepts of determining the techniques of finding the stresses.
- Analyzing the different types of indeterminate beams.
- Analyzing the different type of arches.
- They will be able to identify the different types of concrete and their properties.

TEXT BOOKS:

1. A.K.Jain and B C Punmia. Strength of Materials
2. Ramamrutham, S. Theory of Structures, 17th ed. Danpat Rai Pub. Co. Ltd., New Delhi, 2005.
3. Reddy, C.S. Basic Structural Analysis, 18th ed. Tata McGraw Hill Pub.Co.Ltd., New Delhi, 1991.
4. R.K. Bansal, “A Text Book on Strength of Materials”, Laxmi Publications, New Delhi, 2006.

REFERENCES:

1. M.M. Ratwani & V.N. Vazirani, “Analysis of Structures”, Vol. 1, Khanna Publishers, Delhi, 2012.
2. Timoshenko, S.P. and D.H. Young, “Elements of Strength of Materials”, Fifth edition, East West Press, 1993.
3. A.R. Jain and B.K.Jain, “Theory and analysis of structures”, Vol. 1, Nemchand and Bros, Roorkee, 1987.
4. R.K. Rajput. “Strength of Materials”, S.Chand, 2006.

Subject : BUILDING SERVICES – I (Water Supply, Plumbing & Sanitation)		
Code : ART305	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

Understanding the significance, design and functioning of water and sewerage systems as essential components in building design and site planning.

OBJECTIVE:

To introduce and expose the students to various ways to provide information on the principles and appurtenance of water supply and sanitation systems.

CONTENTS:

UNIT-I: SOURCES AND TREATMENT OF WATER

4hrs Types of sources, surface sources, underground sources, types of well construction, yield of a well, spacing of wells, sanitary protection of wells. Principles involved in water treatment.

UNIT-II: DISTRIBUTION SYSTEM OF WATER

6hrs

Methods of distribution, service reservoirs, systems of supply of water, methods of layout of distribution pipes, Pipe appurtenances, air valves, reflux valves, relief valves, relief valves, scour valves, sluice valves, sluce cocks, use of pumps in water supply systems.

UNIT-III: DOMESTIC UTILISATION

10hrs

Principles of house drainage, traps, sanitary fittings, system of plumbing, drainage plans, testing of drains and pipes, maintenance of house drainage system. Domestic Water demand, Over Head and underground (sump) Water tanks. Cold and hot water distribution within the buildings. House/service connection. Layout of water supply lines in a domestic house. Types of fittings like taps, bathtubs, showers, jets, cocks, valves, electrical fixtures, etc. Faucets for kitchens, bathrooms and toilets. Check valves, foot valves, sump pump check valves, and pressure test gauges. Rain Water Harvesting

UNIT-IV: SANITATION

5hrs

Basic principles of sanitation and disposal of waste matter from building. Brief description of various systems of sewage disposal and their principles. Conventional water treatment – sedimentation, coagulation, filtration and disinfection. Distribution system, sanitary, storm and combined sewerage system. Design of sewerage systems, Location of sewage systems, conventional wastewater treatment, activated sludge, trickling filters etc.

UNIT-V: DISPOSAL SYSTEMS

3 hrs

Waste-water disposal systems, septic tank and its design, soil absorption system, alternatives, solid wastes collection and removal from buildings. On-site processing and disposal methods. Aerobic and Anaerobic decomposition, purifying capacity of water bodies. Biochemical Oxygen Demand.

UNIT-VI: ROADS AND PAVEMENTS

4 hrs

Different types, water bound macadam, tar bitumen, asphalt and Cement concrete roads, soil stabilization, types of paving-murram, brick, and stone paving. Drainage of roads, sub-drains, culverts, ditches and gutters.

Design considerations on drainage scheme:

4 hrs

Types of fixtures and materials- wash basins, water closets, urinals, bidets, sinks etc. Conditions of flow in building drainage pipes, traps, vents and their material specifications. Over-head and underground reservoirs. Details study of Independent House and Apartment

Design of drainage and vent pipes, system for low-rise and high-rise buildings, building drains, sewers, gullies, inspection chambers, manholes, connection to public sewer, cross connections, ferrule, water meters, stopcocks, bib cocks etc. Modern techniques in Re-Use of the Grey water like DEWARTS

TOTAL – 36hrs

OUTCOME:

Market survey to understand the water supply and sanitary fittings and cost, layout of water supply and sanitation for small scale residential buildings.

REFERENCES:

1. S.C. Rangwala. Water Supply and Sanitary Engineering.
2. Birdie J.S. and Birdie G.S. (1998). *Water Supply and Sanitary Engineering*. Dhanpathray Publishing Company, New Delhi.
3. Burke, Ken. (1982). *Basic Plumbing Techniques*. Ortho Books, Chevron Chemical Company, San Ramon, Canada.
4. Kshirsagar, S.R. Water Supply Engineering, 6th ed. Roorkee Pub., Roorkee, 1980.
5. Husain, S.K. T.B. of Water Supply and Sanitary Engineering, 3rd ed. Oxford and IBH Pub. Ltd., New Delhi, 1994.

Subject : SURVEYING & LEVELLING		
Code : ART306	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To give knowledge about different instruments and techniques used in surveying of land tacks.

OBJECTIVES:

- Understand the basic principles of Surveying.
- Learn Linear and Angular measurements to arrive at solutions to basic surveying problems.
- Employ conventional surveying data capturing techniques and process the data for computations.
- Analyze the obtained spatial data to compute areas and volumes and draw contours to represent 3D data on plane figures.

CONTENT:

UNIT-I: INTRODUCTION

5hrs

Introduction to surveying, understanding land topography and its relevance in Architecture. Types of surveys in practice, Introduction to survey equipments

UNIT-II: CHAIN SURVEYING

5hrs

Chain surveying - Principles of survey, equipment required, selection of station, methods of taking offsets. Booking the field notes, obstacles in chaining, errors in chaining, chaining on sloping ground and reciprocal ranging.

UNIT-III: COMPASS SURVEYING AND THEODOLITE SURVEYING

10hrs

The prismatic compass, its construction and uses. Other types of compasses. Reduced and whole circle bearing, magnetic declination, effects of local attraction. Compass traverse and balancing the closing error. Theodolite, its temporary and permanent adjustment, measuring of magnetic bearings, horizontal and vertical angles. Theodolite traverse and balancing the closing error.

UNIT-IV: LEVELING

10hrs

Different types of levels, their temporary and permanent adjustment, leveling staff. Book of the readings and reduction of levels. Errors in leveling. Curvature and refraction reciprocal leveling profile, leveling cross sections.

UNIT-V: PLANE TABLING AND CONTOURING

12hrs

Plane Tabling - Equipment and method two points and three point's problems. Contouring - Characteristics of contour lines, direct and indirect methods of contouring and interpolation of contours. Interpretation and preparation of contour maps. Site modeling with total station. Exercises in setting out of building works

TOTAL: 42hrs

PRACTICALS:

1. Linear measurement using chain and tape by ranging
2. Setting out different geometric shape in site by using compass
3. Conducting profile leveling
4. Difference in elevation
5. Laying of centerline of a building

OUTCOMES:

After a successful completion of the course, the student will be able to:

- Posses a sound knowledge of fundamental principles Geodetics
- Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
- Capture geodetic data to process and perform analysis for survey problems.
- Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours.

TEXT BOOKS:

1. B.C. Punmia, "Surveying Vol.1", Laxmi Publications pvt. Ltd., New Delhi – 2009.
2. Kanetkar T P and S V Kulkarni, Surveying and Leveling Part I, Pune Vidyarthi Griha Prakashan, 1988.

REFERENCES:

1. S.K. Duggal, "Surveying Vol.1", Tata McGraw Hill Publishing Co. Ltd. New Delhi. – 2009.
2. K.R. Arora, "Surveying Vol. 1" Standard Book House, New Delhi. – 2010
3. R Subramanian, Surveying and Leveling, Second edition, Oxford University Press, New Delhi.

Subject: CLIMATOLOGY		
Code : ART307	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To create an awareness that architecture also has influence of climate, by exposing the students to factors of climate, the various climatic zones, heat flow through materials in building envelope for design Considerations.

OBJECTIVES:

- To study human heat balance and comfort.
- To familiarize students with the design and settings for buildings for daylight and factors that influence temperature.
- Understanding climate and its impact on architectural design,
- To understand the air pattern around buildings and the effect of wind on the building.
- To expose the students to the various design strategies for building in different types of climatic zones in the world.

CONTENTS:

UNIT-I: INTRODUCTION

6 hrs

Introduction to the global climatic factors and its effect on human comfort. Macro climate, micro climate, climate and weather, Study of world climatic zones, tropical climate, characteristics of different climatic zones and elements of climate.

UNIT-II: THERMAL COMFORT

6 hrs

Thermal comfort factors, heat exchange of buildings, bio climatic chart. The transfer of heat through building, Definitions – Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity – Surface resistance and air cavities – Air to air transmittance (U value) – Time lag and decrement factor.

UNIT-III: SOLAR GEOMETRY AND SHADING DEVICES

12 hrs

Solar geometry, Solar charts, Locating the position of sun – Sun path diagram – Overhead period– Solar shading–Shadow angles – Design of appropriate shading devices, orientation of window ,internal blinds and curtains, Special glasses, external shading devices Methods of controlling solar heat gain, building form and heat gain, thermal insulation. Structural controls: Site analysis, Building Orientation and Placement, Effects of Landscaping element on micro climate.

UNIT-IV: DAY LIGHTING

6 hrs

Sky as the source of internal light, day light factor, components of day light factor, the sky component, the external reflected component and internal reflected component, glare, recommended levels of illumination for different types of buildings (ref. Relevant IS code)

UNIT-V: VENTILATION AND AIR MOVEMENT

9 hrs

Macro and micro climatic wind pattern and air flow, types of ventilation, principles and functions of natural ventilation, air changes, wind flow around buildings and air flow pattern inside the buildings. Window sizes, Stack Effect and thermally induced air currents.

UNIT-VI: SHELTER FOR DIFFERENT CLIMATES

9 hrs

Design strategies in Hot-dry, warm-humid, composite and tropical upland climate, and Climate responsive design exercises in Indian context.

OUTCOMES:

- Understanding of Thermal balance in Human beings.
- Conceptual understanding of Air flow in Buildings.
- Design of shading devices.
- Designing Climate responsive structure.

TEXT BOOKS:

1. O.H. Koenigsberger and Others, “Manual of Tropical Housing and Building” – Part I - Climate design, Orient Longman, Madras, India, 2010.
2. Kukreja, C.P. Tropical Architecture. Tata McGraw-Hill Pub. Co. Ltd., New Delhi, 1978.
3. Olgyay and Olgyay. Solar Control and Shading Devices.
4. G.Z Brown and Mark Dekay “Sun,wind and light” Architectural Design Strategies
5. Konya, Allan. Design for Hot Climates.
6. Victor Olgyay “Design with climate”.
7. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999.

REFERENCES:

1. Martin Evans, “Housing Climate and Comfort”, Architectural Press, London, 1980
2. B. Givoni, “Man, Climate and Architecture”, Architectural Sciences Series – Applied Science Publishers Ltd., London, 1981.
3. B. Givoni, “Passive and Low Energy Cooling of building”, Van Nortrand Reinhold New York, USA, 1994.
4. Galloe, Salam and Sayigh A.M.M., “Architecture, Comfort and Energy”, Elsevier Science Ltd., Oxford, U.K., 1998.
5. Bureau of Indian Standards IS 3792, “Hand book on Functional requirements of buildings other than industrial buildings”, 1987.

Subject: COMPUTER APPLICATION – I		
Code : ARS308	Credits : 2	Hours / Week: 3hrs.
Progressive Marks : 100	Examination Marks : NIL	Mode of Exam: NIL

AIM:

To orient the student to create two and three-dimensional objects in space with special emphasis on presentation and visualization of interiors and exteriors of building using different rendering techniques using CAD and sketch up.

OBJECTIVES:

- To explore computer modeling techniques using CAD and sketch up.
- To learn basic skills of modeling, rendering in CAD, and to exercise methods of interface within CAD and sketch up.

CONTENTS:

UNIT – I:STARTING AUTO CAD

9 hrs

Introduction to the menu, starting drawings from scratch, Creating and using templates-starting drawings with setup wizards. Saving and closing a file. Using co-ordinate system: The UCS, Working with Cartesian and polar co-ordinate systems, using displays with key shortcuts.

UNIT – II: SETTING UP THE DRAWING ENVIRONMENT

9 hrs

Setting the paper size, Setting units, setting grid limits, drawing limits, Snap controls, Use of paper space and model space.

Basic commands dealing with drawing properties: Layer control, change properties, line weight control, etc. Inquiry methods: Using database information for objects, calculating distance and angle, areas etc.

UNIT – III: DIMENSIONING COMMANDS AND BLOCKS

12 hrs

Dimensioning the objects in linear, angular fashions along with quick time dimensioning etc. Creating and working with blocks, creating symbols, use of blocks in creating a layout of a residential area- one exercise to be done as lab assignment. Plotting, plot styles and printing with the help of layers.

Introduction to 3D modelling, rendering and setting: Create 3D sculpture using 3D primitives (cubes, spheres etc.)

UNIT – IV: INTRODUCTION TO SKETCH UP

9 hrs

- Using various drawing, editing and dimensioning tools.
- Using various 3d tools eg: follow me, mirror, rotate. Using layers, sandbox, shadows, and styles.
- Creating groups, components and using solid tools.

UNIT – V: CREATING WALK THROUGH, 3D RENDERING

9 hrs

Using interfaces such as V-ray, lumion. Application of the above learning in a selected design project done in the previous semester

TOTAL – 48hrs

OUTCOMES:

- Students must be capable of using all the auto cad tools and able to create any kind of two

dimensional forms.

- Must be able to do all kind of working drawings using auto CAD.
- One must be capable of creating a 3 dimensional forms of a building using sketch up.

REFERENCES:

1. Teyapoovan, T. Engineering Drawing with Auto CAD 2000. Vikas Pub. House Pvt. Ltd., New Delhi, 2000.
2. Parker, Daniel and Rice, Habert. Inside Auto CAD Daniel. 1987.
3. Georgeomura, Auto CAD Release 2000.
4. AutoCAD 2010 Textbook-AutoCAD 2010: A Problem-Solving Approach-Customizing AutoCAD 2010
5. Beginning AutoCAD 2007- By Bob McFarlane, Robert McFarlane.
6. Ralph Grabowski, "The Illustrated AutoCAD 2002 Quick Reference", 1st edition, Cengage Learning, 2001
7. Sham tikoo, "Autocad 2000: A Problem-Solving Approach",.Delmar Cengage Learning, 1999.
8. Fiorello. J. A., "CAD for Interiors beyond the basics", Wiley publications, 2011.
9. Aidan chopra: "Google sketch up for dummies".
10. Chrisgrover, Google sketch up: "The missing manul".

SEMESTER - IV

Subject: ARCHITECTURAL DESIGN - III		
Code : ARS401	Credits : 10	Hours / Week: 10 hrs.
Progressive Marks : 60	Examination Marks : 40	Mode of Exam : Jury

AIM:

This course is to study of the physical, socio economic, climatic and cultural aspects of a selected **village** by conducting various surveys to understand the settlement pattern, housing stock and amenities that exist or required

OBJECTIVE:

- To understand the linkages between Occupation, Social structure and Religious beliefs and its physical manifestation in the form of the settlement to expose the students towards the design of simple community oriented buildings.
- To expose the vernacular / traditional architecture involving local materials and construction techniques
- To emphasis on the importance of designing built form and open spaces that meet the aspirations of the community.
- Identification of a suitable Design intervention that would improve the quality of life
- To enable the presentation of concepts through 2D and 3D presentation including sketches and model

CONTENT:

Scale and Complexity: Projects involving public and community oriented buildings - Design of housing prototypes for a particular community / occupation using rural building materials & cost effective technology with comprehensive analysis of rural settlement in a hierarchical manner. Suggestive Typologies/ projects: Rural projects that involve studies and design at settlement and building level- noon meal centre, market, primary health center; departmental store, higher, secondary school, students center at campus level.

TOTAL – 192 hrs

OUTCOME:

Student's ability to understand the concept of community and settlement evolution and the built environment as influenced by Socio-economic, Cultural, Climatic and Environmental factors.

REFERENCES:

1. Joseph De Chiara, Michael J Crosbie, "Time Saver Standards for Building Types", McGraw Hill Professional 2001.
2. Julius Panero, Martin Zelnik, "Human Dimension and Interior Space", Whitney Library of Design, 1975.
3. Joseph De Chiara, Julius Panero, Martin Zelnik, "Time Saver Standards for Interior Design and Space Planning", McGraw Hill, 2001.
4. Ernst Neufert "Architects Data", Blackwell 2002
5. Ramsey et al, "Architectural Graphic Standards", Wiley, 2000.
6. Richard P. Dober, "Campus Planning", Society for College and University Planning, 1996.
7. Kanvinde, "Campus design in India", American year Book, 1969
8. Kevin Lynch, "Site planning", MIT Press, Cambridge, 1984.
9. Sam F. Miller, "Design Process: A Primer for Architectural and Interior Design", Van Nostrand Reinhold, 1995

Subject: BUILDING MATERIALS&CONSTRUCTION - IV		
Code : ART402	Credits : 6	Hours / Week:6 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs.

AIM:

Aimed at understanding construction techniques in RCC framed structures and various properties of material in flooring, plastering and painting.

OBJECTIVE:

- To acquaint the students with constructional practices pertaining to RCC floors and roofs, flooring with different materials and plastering and painting
- To develop an understanding of design and detailing issues of RCC constructions
- To acquaint the students with advanced RCC elements
- To introduce various materials for water proofing and anti-termite protection systems and their methods of construction.

CONTENTS:

UNIT-I: MATERIALS

12hrs

Plastering: Plastering-internal, external surfaces, pointing.

Painting: constituents of paints, types, characteristics, method of application, selection of paints, and storage of paints.

Types varnishes (oil and spirit): characteristics and uses of varnishes. French polish, anti corrosive paint, damp proofing finishes.

Floorings :Introduction, essential requirements of a floor, factors affecting selection of flooring material, Various natural as well as artificial flooring materials like brick, flag stone, tiled ,cement concrete, granolithic, terrazzo, marble, shah bad stones timber flooring, timber floor supported on RSJ ,flag stone floor resting on RSJ, vitrified tiles, ceramic tiles, , Mosaic, rubber, Linoleum, and PVC and PVA flooring

UNIT-II: FLAT ROOFS/FLOORS

24hrs

Different Types of Roof / Floor: Brick jack arch, madras terrace, ordinary flat brick floor (used in North India)

RCC SLABS-One way discontinuous and continuous slab -- Two way discontinuous and continuous slab, Cantilever slab, Flat slab , Waffle, Coffe slabs, Ribbed slabs, Filler Slabs

UNIT-III: RCC COLUMNS AND BEAMS

18hrs

RCC columns –different shapes, different combinations, loading conditions (axial, bending, non axial) and slenderness factor. RCC beams - Single and doubly reinforced beams, T and L beams, continuous beams, lintels and brackets, Retaining wall.

UNIT-IV: TEMPORARY CONSTRUCTIONS

12hrs

Timbering for trenches – shoring – underpinning – scaffolding - form-work for RCC column and beam, slab, stairs. Formwork-simple shuttering (wooden and metal/sheet) methods for RCC columns, beams, slabs, staircases, Pile cantering / scaffolding.

UNIT-V: SKYLIGHTS

6 hrs

Construction – skylight, roof lights, dormer windows in sloped and flat roofs

UNIT-VI: DAMP PROOFING, WATER PROOFING AND ANTITERMITE TREATMENT

18hrs

Materials for Special Treatments: damp proofing, Water proofing materials and Anti-termite treatment materials.

Construction methods for water-proofing and damp proofing for walls, roofs, basements, retaining walls, toilets, terrace gardens, balconies, swimming pools etc. -Exercises of the above through case studies and drawings. Anti-termite treatment to foundation and masonry walls.

TOTAL – 90 hrs

OUTCOME:

The course shall include submission of drawing plates, site visits, market surveys, model making, sample collections and presentations.

TEXT BOOKS:

1. Chudley R. (1998). Construction technology. ELBS England.
2. McKay, G.B. (1972). Building Construction (Metric). Longman, London.
3. Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.

REFERENCES:

1. Bindra, S P. and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
2. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
3. Rangwala, S.C. Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
4. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.
5. Gurucharan Singh. (1981). Building Construction Engineering. Standard Book House, New Delhi.
6. Foster, Stroud. (1963). Mitchell's Advanced Building Construction. Allied Publishers Private Limited, Bombay.
7. Dr.T.S.Balagopal Prabhu. (1987). Building Drawing and Detailing. Spades Publishers Pvt. Ltd., Calicut.

Subject : HISTORY OF ARCHITECTURE– IV		
Code : ART403	Credits : 2	Hours / Week: 3 hrs.

AIM:

To provide an understanding of the evolution of Islamic and Colonial Architecture in India in their various stylistic modes characterized by technology, ornamentation and planning practices

OBJECTIVES:

- To make the students understand contributions to architecture by the Islamic and Colonial period and the varieties of building materials and techniques adopted by them.
- To study the development of Islamic architecture in the west. The advent of Islam into India, Architecture of early Islamic Delhi and the regional variations. Influences of Islamic ideas on secular and religious architecture in India and the Mughal period in India.
- To enable the students to understand the influence of Religion in India and architecture of buildings by studying specific examples.
- To study the evolution of building typologies during different periods with selected examples in India.
- To explain the students the evolution of architecture in relation to time with special emphasis to geographical, geological, social, religious, political, aesthetical and environmental factors.
- To make the students understand the developments in the construction technology in different periods.

CONTENTS:**UNIT-I: INTRODUCTION TO ISLAMIC ARCHITECTURE**

8 hrs

Formation and Development of Islamic Architecture - Characteristic Features, History of Islam: birth, spread and principles - Islamic architecture as rising from Islam as a socio cultural and political phenomenon- evolution of building types in terms of forms and functions: Islam and its philosophy, its implementation in various building types such as mosque, tomb, madarasa, palace, caravanserai, market, fort and their elements like domes, minarets, arch etc. Character of Islamic architecture: principles, structure, materials and methods of construction, elements of decoration, colour, geometry, light.

UNIT-II: ISLAMIC ARCHITECTURE IN INDIA - IMPERIAL STYLE

12 hrs

Formation and Development of Islamic Architecture in India - Characteristic Features of Imperial style. Brief reference to religion and culture of Muslim period in India. Salient features of an Indian mosque and Evolution of the Islamic Arch. Advent of Islam into the Indian subcontinent and its impact including the change in the architectural scene- overview of development based on political history and the corresponding classification of architecture - Islamic architecture in India: sources and influences establishment of the Delhi Sultanate- evolution of architecture under the Slave, Khilji, Tughlaq, Sayyid, Bahamani, Moghal and Lodhi Dynasties – tombs in Punjab- important examples for each period. Examples – Qutb Minar, Delhi. Varieties of squinch – Alai Darwaza, Delhi - Tomb of Ghiasuddin Tughlaq & Khirki Masjid – Shish gumbad & Purana Quila, Delhi.

UNIT-III: ISLAMIC ARCHITECTURE IN THE PROVINCES -PROVINCIAL STYLES

8hrs

Development of the provincial styles in different regions. Shift of power to the provinces and evolution of regional architecture with their own unique influences: geographic, cultural, political, etc. Example of Punjab style – Tomb of Shah Rukni Alam – Example of Bengal style – Chotasona masjid. Gaur – Example of Jaunpur style – Atala masjid – Example of Gujarat style – Jami Masjid, Ahmedabad and Rajasthan – Examples of Deccan style – Golgumbaz, Bijapur, & Charminar, Hyderabad.

UNIT-IV: THE MUGHAL PERIOD IN INDIA

9 hrs

Development of the Mughal style. Mughals in India- political and cultural history- synthesis of Hindu-Muslim culture, Sufi movement -evolution of architecture and outline of Mughal cities and gardens under the Mughal rulers: Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb- important examples- decline of the Mughal empire. Important examples –Humayuns Tomb, Delhi, Fatehpur Sikhri (lay out, Buland darwaza, Diwani Khas, Tomb of Salim Chisti & Jami masjid) Akbars Tomb at Sikandara – The Taj Mahal, Agra – Red Fort, Delhi (Diwan-i-Am, Rang Mahal).

UNIT-V: ARCHITECTURE IN COLONIAL INDIA

8 hrs

Arrival of British – Early Colonial period, Monumental buildings of Early colonial period – Examples – St.Pauls Cathedral, Calcutta & Bombay Town hall –Architectural character of Indo-Saracenic and Classical revival –University of Madras Senate House & Victoria Memorial hall, Calcutta – Later Colonial period – Contribution of Edwin Lutyens & Herbert Baker to the lay-out and Architecture of New Delhi – Rashtrapathi Bhavan & Parliament House.

TOTAL - 45 hrs

OUTCOME:

The course shall include assignments, tests, sketching, portfolios, seminar, presentations and model making.

TEXT BOOKS:

1. Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition), 1999.
2. G. K. Hiraskar, "Great Ages of World Architecture", Dhanpat Rai & Sons, Delhi.
3. Spiro Kostof, "A History of Architecture: Setting and Rituals", Oxford University Press, London, 1985
4. Francis D K Ching "Global History of Architecture".
5. Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
6. Emily Cole "Grammar of Architecture".
7. George Mitchell, "Architecture of the Islamic World - Its History and Social meaning",
8. Thames and Hudson, London 1978.
9. Robert Hillenbrand, "Islamic Architecture- Form, Function and Meaning", Edinburgh University Press 1994.
10. Brown Percy, "Indian Architecture (Islamic Period)", Taraporevala and Sons, Bombay, 1983.
11. Satish Grover, "Islamic Architecture in India", CBS Pub, New Delhi, 2002.

REFERENCES:

1. Rowl, Benjamin. Art and Architecture of India.
2. Tadgell, Christopher. The History of Architecture in India: from the Dawn of Civilization to the End of the Raj. Om Book Service, New Delhi, 1990.
3. Vistara. The Architecture of India
4. Rustam J Mehta "Master Pieces of Indo-Islamic Architecture".
5. Thames and Hudson "Architecture of the Islamic World"
6. Rupinder & Reeta Khullar "Delhi, Agra and Jaipur"

7. Henry Stierlin "Islam"
8. Emily Cole "The Grammar of Architecture".
9. David Watkin "A History of Western Architecture
10. Benevolo, Leonardo. History of Modern Architecture: the tradition of modern architecture Vol.1. Routledge and Kegan Paul, London, 1971.
11. Frampton Kenneth "Modern Architecture": A Critical History London: Thomes & Hudson, 1980.
12. Curtis, J.R. William. Modern Architecture since 1900. Prentice-Hall, Inc., New Jersey, 2002.
13. Giedion, Sigfried, Space, Time and Architecture: the growth of a new tradition, 4th ed. Harvard Universtiy Press, Cambridge, 1962.
14. Hilberseimer, L. Contemporary Architecture: Its roots and trends. Paul theobald, Chicago, 1964.
15. Pevsner, Nicolaus Oersonem: Pioneers of Modern Design from William Morris to Walter Gropius-.
16. Sharp, Dennis. Twentieth Century Architecture: A Visual History, Facts on File. New York, 1991
17. Norbergschul C., Principles of Modern Architecture, London Andreas papadakes,2000.
18. R.Nath, "History of Mughal Architecture", Vols I to III - Abhinav Publications, New Delhi, 1985.
19. Catherine Asher, "Architecture of Mughal India", Cambridge University Press, 2001
20. Monica Juneja, "Architecture in Medieval India: Forms, Contexts, Histories", New Delhi, Permanent Black, 2001.

Subject : DESIGN OF RCC STRUCTURES – I		
Code : ART404	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs.

AIM:

To give an in-depth understanding of concept associated with design of different elements of structures

OBJECTIVES:

- To develop an understanding about the design through working stress and limit state methods.
- To apply the above two methods for the design of Concrete beams and slabs under various conditions.

CONTENT:

UNIT-I: CONCEPT OF RCC DESIGN

6 hrs

Introduction to RCC design, design philosophies: working stress and limit state method of RCC design. Use of design Aids - IS 456:2000 design consideration

UNIT-II: DESIGN OF BEAMS

9 hrs

Design of simply supported singly and doubly reinforced rectangular and continuous beams

UNIT-III: DESIGN OF BEAMS

9 hrs

Design of T-beams, cantilever beams, lintels

UNIT-IV: DESIGN OF SLABS

9 hrs

Behavior of one way and two way slab. Design of one way, two way slabs and continuous slab with different end conditions

UNIT-V: DESIGN OF FLAT SLABS

9 hrs

Behavior of flat slab and flat plate, Advantages of flat slab construction – Components of flat slab. Design of flat slab and flat plate

TOTAL- 42hrs

OUTCOMES:

At the end of the course, the student should be able to:

- Understand the different concepts of WSM and LSD methods using the codal provisions.
- Design RCC beams and slabs by applying the above concepts.
- Submit the plates with a detail understanding of RCC members and site visits.

TEXT BOOKS:

1. A.K.Jain. Reinforced Concrete: Limit State Design, 5th ed. New Chand and Bros., Roorkee, 1999.
2. Ramamrutham. S. and Narayan, R. Design of RCC Structures, 12th ed. Dhanpat Rai Pub. Co. Pvt. Ltd., Delhi, 1998.
3. S.N. Sinha, “Reinforced Concrete Design”, Tata McGraw Hill Publishing Co. Ltd, New Delhi, 1998.
4. Shah, “Reinforced Concrete”, Vol. 1 and 2, Charotar Publishing House, Anand, 1998.

REFERENCES:

1. P.Dayaratnam, “Design of Reinforced Concrete Structures”, Oxford and IBH Publishing Co., 1983.
2. C. Sinha and S.K. Roy, “Fundamentals of Reinforced Concrete”, S.Chand & Co., New Delhi, 1983.
3. Dr. B.C. Punmia, “Reinforced Concrete Structures”, Vol, 1 & 2 Laxmi publication, Delhi, 2004.
4. IS 456 “Indian Standard, Plain and Reinforced Concrete, Code of Practice, Bureau of Indian Standards, 2000.
5. S.Unnikrishnan Pillai and Devados Menon, “ Reinforced Concrete Design” – Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

Subject : ENVIRONMENTAL SCIENCE		
Code : ART405	Credits : 2	Hours / Week: 2 hrs.

AIM:

To sensitize students towards sustainable environment

OBJECTIVE:

- To identify the major challenges in environmental issues and evaluate possible solutions.
- Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.
- To analyze an overall impact of specific issues and develop environmental management plan.

CONTENT:**UNIT-I: INTRODUCTION**

5 hrs

Environment - Components of Environment Ecosystem: Types & Structure of Ecosystem, Balanced ecosystem Human Activities – Food, Shelter, And Economic & Social Security. Impacts of Agriculture & Housing Impacts of Industry, Mining & Transportation Environmental Impact Assessment, Sustainable Development

UNIT-II: NATURAL RESOURCES

5 hrs

Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water Mineral resources, Forest Wealth Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle. Energy – Different types of energy, Conventional sources & Non Conventional sources of energy solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy.

UNIT-III: ENVIRONMENTAL POLLUTION

5 hrs

Water Pollution, Noise pollution, Land Pollution, Public Health Aspects, Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management.

UNIT-IV: AIR POLLUTION & AUTOMOBILE POLLUTION

5 hrs

Definition, Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures. Solid Waste Management, E - Waste Management & Biomedical Waste Management - Sources, Characteristics & Disposal methods

UNIT-V: INTRODUCTION TO GIS & REMOTE SENSING

5 hrs

Applications of GIS & Remote Sensing in Environmental Engineering Practices. Environmental Acts & Regulations, Role of government, Legal aspects, Role of Non-governmental Organizations (NGOs), Environmental Education & Women Education.

TOTAL- 25 hrs

OUTCOME:

- Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
- Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
- Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
- Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

TEXT BOOKS:

1. Benny Joseph (2005), “Environmental Studies”, Tata McGraw – Hill Publishing Company Limited.
2. R.J.Ranjit Daniels and Jagadish Krishnaswamy, (2009), “Environmental Studies”, Wiley India Private Ltd., New Delhi.
3. R Rajagopalan, “Environmental Studies – From Crisis to Cure”, Oxford University Press, 2005.
4. Aloka Debi, “Environmental Science and Engineering”, Universities Press (India) Pvt. Ltd. 2012.

REFERENCES:

1. Raman Sivakumar, “Principals of Environmental Science and Engineering”, Second Edition, Cengage learning Singapore, 2005
2. P. Meenakshi, “Elements of Environmental Science and Engineering”, Prentice Hall of India Private Limited, New Delhi, 2006
3. S.M. Prakash, “Environmental Studies”, Elite Publishers Mangalore, 2007
4. Erach Bharucha, “Text Book of Environmental Studies”, for UGC, University press, 2005
5. G.Tyler Miller Jr., “Environmental Science – working with the Earth”, Tenth Edition, Thomson Brooks /Cole, 2004
6. G.Tyler Miller Jr., “Environmental Science – working with the Earth”, Eleventh Edition, Thomson Brooks /Cole, 2006
7. Dr.Pratiba Sing, Dr.AnoopSingh and Dr.Piyush Malaviya, “Text Book of Environmental and Ecology”, Acme Learning Pvt. Ltd. New Delhi.

Subject : BUILDING SERVICES – II (Electricals & Acoustics)		
Code : ART406	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

Understand the operations of Lifts & Escalators locations, functions and various equipments used in HVAC and application of Fire fighting NBC norms in complex buildings.

OBJECTIVE:

- To identify the factors responsible for cooling load calculation.

- To classify different types of Air Conditioning systems and their suitability for different psychometric conditions.
- To explain the function of mechanical equipments for vertical transportation (elevators and escalators for buildings).
- To explain the different fire fighting methods to be adopted in buildings.
- To plan buildings as per the fire safety norms.

UNIT-I: INTRODUCTION

6 hrs

Scope and impact of Mechanical system- Impact on Building design. Mechanical Services required in Buildings. Role of an Architect regarding mechanical Services

UNIT-II: MECHANICAL EQUIPMENTS FOR VERTICAL TRANSPORTATION

8 hrs

Building design and vertical transportation, Demand for vertical transportation. *Lift and Escalators*: types, uses, functioning, automatic control system, Plans & sections to explain different parts of lifts and escalators. Planning for vertical transportation

UNIT-II: PSYCHOMETRIC PROPERTIES

6 hrs

Psychometric chart & its application summer air conditioning system, winter air conditioning system, and year round air conditioning system. Conditions for comfort Control of quality, quantity, temperature and humidity of air.

UNIT-IV: PRINCIPLES OF AIR-CONDITIONING

6 hrs

Refrigeration cycle, Introduction to air conditioning, Indoor Air Quality (IAQ), comfort conditions, A/C equipment, compressor heat exchangers, condenser, evaporators, *Types of Air-conditioning*: single zone, multi zone, window air conditioners, split air conditioners, ductable air conditioners, package system and central air conditioning, all air systems and chilled water systems. A/C plant room, Air Handling Units (AHU's) Building ducting, diffusers and grills, Fan Coil units

UNIT-V: FIRE FIGHTING NORMS (NBC) & EQUIPMENTS

6 hrs

Role and Importance, Fire safety design, planning for fire protection. Fire detection & fire fighting. Different fire fighting methods to be adopted in buildings

OUTCOME:

Case study or site visit to understand the location of lifts, escalators, Central AC Plant system, and firefighting equipments in complex buildings like Malls, High raised buildings and Multispecialty hospitals.

TOTAL – 36 hrs

REFERENCES:

1. Roger W.Haines: HVAC system design handbook.
2. Ananthanarayanan PN: Refrigeration and Air Conditioning.
3. ISHRAE: HVAC hand book
4. Architectural Graphic Standard (HVAC System)
5. National Building code.
6. William.K.Y.Tao; "*Mechanical and electrical Systems in Buildings*"
7. V.P.Lang, "*Principles of air conditioning*"
8. Rodney R.Alder ; "*Vertical Transportation for Building*" .
9. Lord, Peter and Templeton, Duncan. *The Architecture of Sound: Designing.*
10. Places of Assembly. Architectural Press Ltd., London, 1986.
11. Egan, David. *Architectural Acoustics*, MC Graw-Hill Book Ccompany, New York, 1988.

Subject: COMPUTER APPLICATIONS – II		
Code : ARS407	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 100	Examination Marks : NIL	Mode of Exam : NIL

AIM:

To orient the student to create three-dimensional objects in space with special emphasis on presentation and visualization of interiors and exteriors of building using different rendering techniques using software's like Revit Architecture, ArchiCAD, 3Ds max, Lumion.

OBJECTIVE:

To explore 3d modeling techniques using a 3d software. And to explore presentation techniques using photoshop

CONTENTS:

UNIT-I: INTRODUCTION

12 hrs

To digital theory and this unit equips students with an understanding of the territory of computational design through its theoretical vocabulary and relevant histories.

3d modeling and different types of methods in 3 modeling like polygonal modeling , NURBS modeling , subdivision surface modeling and building information modeling etc to design and test Architectural built environments virtually.

UNIT-II: SCENE SETUP

12 hrs

involves arranging virtual objects, lights, cameras 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, Digital solar studies

UNIT-III: BUILDING INFORMATION MODELING

12 hrs

3dimensional, real-time, dynamic building modeling software to increase productivity in building design and construction. The process produces the Building Information Model (also abbreviated BIM), which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.

Design and documentation using building information modeling application like Revit Architecture, ArchiCAD, 3Ds max, Lumion

Unit-IV: INTRODUCTION TO PHOTOSHOP

9 hrs

Introduction to the Photoshop tools, working in layers, Rendering and scene setting to create a photo realistic picture, Presentation skills are taught to the students to render plans, sections and views photomontage

TOTAL – 45 hrs

OUTCOME:

- Various 3D tool of the software is practiced and one must be capable of creating a 3dimensional building forms using certain software's like Revit architecture, 3ds max, etc.
- To learn the rendering techniques using V-ray or Lumion.
- Finally students will learn the photo editing and photomontage of rendered plans, sections and views of the 3D buildings.

REFERENCE BOOKS:

1. Catalytic Formations: Architecture and Digital Design. Ali Rahim.
2. BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors- Chuck Eastman
3. Building Information Modeling – Willem Kymmell
4. Deke McClelland, "Photoshop 7 Bible Professional Edition", Wiley John & Son INC, New York, 2000.
5. A. Watt, "Fundamentals of Three-Dimensional Computer Graphics", Addison Wesley, Massachusetts, 1989.
6. Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon process, 2012.

Subject: VERNACULAR ARCHITECTURE		
Code : ARE408-1	Credits : 2	Hours / Week: 2 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

ELECTIVE – I

AIM:

This course explores importance of Indian vernacular architecture which serves in creating a balance between nature and socio –economic needs of the society.

OBJECTIVES:

- To introduce the study of vernacular architecture as a process and not a product.
- To provide an overview of the various approaches and concepts to the study of vernacular architecture.
- To study the various vernacular architecture forms in the various regions of the country.
- To look at the impact of Colonial rule on the vernacular architecture of India.

- To understand and inculcate the appropriateness in design to the local context in vernacular architecture.

CONTENTS:

UNIT-I: INTRODUCTION

6 hrs

Definition and classification of Vernacular architecture – Vernacular architecture as a process – Survey and study of vernacular architecture: methodology – Sense of Identity, Continuity, Socio-Cultural and Contextual responsiveness of vernacular architecture: an overview.

UNIT-II: APPROACHES AND CONCEPTS

9 hrs

Different approaches and concepts to the study of vernacular architecture: an over view of historical outline, religious context, and social customs aesthetic, architectural, temporal, political and anthropological studies in detail. Vernacular tradition in building serves in creating a balance between nature and society, optimal utilization of natural resources and of local skills and craftsmanship.

UNIT-III: VERNACULAR ARCHITECTURE OF THE WESTERN AND NORTHERN REGIONS OF INDIA

12 hrs

Forms spatial planning, cultural aspects, symbolism, colour, and art, materials of construction and construction technique of the vernacular architecture of the following: Deserts of Kutch and Rajasthan; Havelis of Rajasthan, Rural and urban Gujarat; wooden mansions (havelis); Havelis of the Bohra Muslims, Geographical regions of Kashmir; house boats

UNIT-IV: VERNACULAR ARCHITECTURE OF SOUTH INDIA

8 hrs

Forms, spatial planning, cultural aspects, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture of the following:

- Kerala: Houses of the Nair & Namboothri community; Koothambalam, Padmanabhapuram palace etc.
- Tamil Nadu: Houses and palaces of the Chettinad region; Agraharams etc.
- Karnataka: Houses of Melkote, Madikere etc.
- Andhra Pradesh – Iktas houses in Nalgonda etc.

UNIT-V: WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE OF INDIA

10 hrs Colonial

influences on the Tradition Goan house - Evolution of the Bungalow from the traditional bangla, Victoria Villas – Planning principles and materials and methods of construction. Settlement pattern and housing typologies in Pondicherry and Cochin.

TOTAL- 45 hrs

OUTCOMES:

- Documentation - The process of Documentation required for reviving traditional methods of construction in Indian Context.
- Promote debate through design workshops, public participations tools like Enquiry by Design workshops, stakeholder's participation, creating graphic and clear visions towards a new built environment of tomorrow.
- Study the present architect's contributions who is maintaining balance with tradition and showcase lessons.

TEXT BOOKS:

1. Oliver, Paul Encyclopedia of Vernacular Architecture of the World, vol. 1-11. Cambridge University Press, Cambridge.1997.

2. Madavi Desai, Traditional Architecture: House Form of Islamic Community in Bohras in Gujarat.
3. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
4. Amos Rapoport, The meaning of the Built Environment, Sage Publications, New Delhi, 1982.
5. R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.

REFERENCES:

1. V.S. Pramari, Haveli – Wooden Houses and Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
2. Kulbushanshan Jain and Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad 1992.
3. Acharya Prasanna K, Indian Architecture according to Manasara Silpasastra, Indian, India, Patna: 1979 (Reprint of 1928 ed.).
4. G.H.R. Tillotson – The tradition of Indian Architecture Continuity, Controversy – Changesince 1850, Oxford University Press, Delhi, 1989.
5. Carmen Kagal, VISTARA – The Architecture of India, Pub: The Festival of India, 1986.
6. S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000.

Subject: BARRIER FREE BUILT ENVIRONMENT		
Code : ARE408-2	Credits : 2	Hours / Week: 2 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

AIM:

This course inculcates skills required for designing for barrier free built environments for physically challenged persons and techniques involved in making such design provisions.

OBJECTIVE:

Indian Disabilities Act, is promulgated in 1995 for the purpose of ensuring equal opportunities to persons with disabilities in society for their development through education, training and rehabilitation services. The principle objective is to ensure their full participation by preventing discrimination and integrating them into the mainstream of society. An Architect plays a very crucial role in this endeavor by designing the needed barrier free environment. The objective of this course is to familiarize the students of architecture regarding the various provisions and design issues.

UNIT-I: INTRODUCTION

6 hrs

Definition of Barrier free built environment, Introduction to Barrier free built environment terms, Definition of Disability. Type of disabilities - Non-Ambulatory, Semi-Ambulatory, Sight, Hearing. Four major Categories of target group to provide fundamental needs: People with impaired mobility, People with visual impairment, People with hearing impairment, People with Learning Disabilities and Mental Retardation.

UNIT-II: BARRIER FREE BASIC ANTHROPOMETRICS AND MOBILITY DEVICES

12 hrs Study of dimensions

that can be used for guidance when designing facilities and equipment to be used by persons with disabilities like Reach Ranges- Forward Reach, Side Reach, White Cane Range, Common Reach Zone, Circulation Dimensions - Wheelchair Dimensions, Walkway Width for Crutch Users, Vision Cone, Heights of People, and Lighting.

UNIT-III: STUDY OF BARRIER FREE DESIGN ELEMENTS

12 hrs

Minimum access provisions required in various types of buildings. Space Allowances – Minimum access provisions, general allowances; Clear or Ground space for wheel chairs; Physical Parameters; Protruding Objects; Ground and Floor Surfaces.

Building Elements like Corridors, Doors and Windows, Stair ways, Elevators, Platform Lifts, Wheel chair lifts, Handrail Requirements, Washrooms, Bathrooms, Shower areas, Controls and operating measures and other facilities – Counter, Water Fountain, Telephone, Mailbox, and Vending Machine.

Provisions in Public spaces and Site Planning - Building vehicular -Parking and Passenger Loading Zones, Curb Ramps, Walks and Paths, Approach to Plinth Level - Ramped Approach Stepped Approach, Entrance Landing, Entrance and Exit doors, etc.

UNIT-IV: SIGNAGE

9 hrs

Types of Signage, signage requirements, Signage Specifications - Character Proportion, Character Height, Raised / Brailled Characters and Pictogram, Finish and Contrast, Mounting Location and Height, Symbols of Accessibility, Illumination Levels. Signage Design- Language, Sign Typeface, Suggested Sizes for Letters and Symbols, Text Design, Colour and Contrast. Sign Installation - Illumination, Sign positioning.

UNIT-V: DISABILITY ACTS AND NATIONAL POLICIES

6 hrs

Introduction to Provisions of persons with Disabilities (Equal opportunities, Protection of Rights and Full Participation) Act, 1995, National Policy for provisions for elderly persons, Concept of equal opportunity, human rights, social justice and empowerment of physically challenged persons. Introduction to similar efforts in other countries. Initiatives at global and International level for protection of rights of disabled and also elderly person. American disabilities Act 1990

Information on various types of national Institutes, agencies and professional bodies involved in disabled welfare, associated norms and standards thereof. The role of NGO's, professional and outreach.

TOTAL- 45 hrs

OUTCOMES:

- Design principles in Architecture for creating environments friendly for various types of physically challenged persons and elderly aged group like Educational Institutions, Hospitals, and Transportation terminals such as bus, railway stations and airports for barrier free spaces.
- Study of Standards as given in guidelines of Time Saver Standards (TSS), Town and Country Planning Organisation (TCPO), Central Public Works Department (CPWD), American Disabilities Act (ADA), etc., and others.
- Exercises in design of user friendly spaces for physically challenged persons. Term paper on certain type of disability and requirements thereof for making environs barrier free or any other exercise appropriately framed by the subject faculty. The exercise can be in two parts.

Initial part will be documentation and the following can be redesign it to be a barrier free environment.

- a) Design Elements within Building Premises
- b) Public spaces
- c) Redesign typical Indian streets to be barrier free.

REFERENCES:

1. Ministry of Urban Affairs and Employment. Central Public Works Department, India, “Handbook on Barrier Free and Accessibility”, 2014.
2. Unnati. Team “Design Manual for a Barrier – Free Built Environment”, Handicap International, December, 2004.
3. ADA Accessibility Guidelines for Buildings and Facilities (ADAAG) US: American Disabilities Act.
4. The National Building Code of India, 2005.
5. Micheal J. Bednar. “Barrier Free Environments”, Dowden, Hutchinson and Ross, Ive 1977.
6. Ministry of Urban Affairs and Employment. Central Public Works Department, India, “Guidelines and Space Standards for Barrier Free Environment for Disabled and Elderly Person, 1998.

Subject: STAGE AND SET DESIGN		
Code : ARE408-3	Credits : 2	Hours / Week : 3 hrs
Progressive Marks : 100	Examination Marks : NIL	Mode of Exam : NIL

AIM:

This particular exercise will highlight the role of the designer in the field of backdrop, set design theme Based Design Strategies and Technology Applications.

OBJECTIVE:

Explore how to create and make believe environment to establish intimacy between the performers and the audience in relation to the theatre and cinemas.

CONTENTS:

UNIT-I: DANCE/ DRAMA/ LECTURE/ THEATRE

Historical Evolution of the stage, degree of encirclement in various types of stage designs such as open air, arena, thrust in and proscenium stages, Script and story board, Terminology and Theory of Stage Design, Technical aspects like Sound, Lighting and Colour scheme, Visualization of and creation of sets e.g. with backdrops and scenery, Set design with appropriate props, Costume design and make up, Expenses.

UNIT-II: FILM SET DESIGN

Film set designs with response to camera positioning and movement, Indoor and outdoor shooting, Film sets as a creation of virtual environment appropriate for the scenery and shots, Support structure for film set erection for indoor and outdoor shooting, Architects role in cinematography: visualization, story board frames, Proportions, Computer generated stage set up :Mixing and editing, Exploring various materials of stage props, Budget.

UNIT-III: TABLE TOP SET UP

Stop motion Animation and computerized animation, Concepts or story, Table top miniature box model, Lighting and special effects, Voice over, music and mixing, Overall editing and final presentation, Costing.

UNIT-IV: EVENT STAGE

Concept and design, Ambience lighting and special effect, Stage props:Video wall presentation, sound and acoustics, Cost and estimation.

TOTAL – 120 hrs

OUTCOME:

To understand practical application in the field of design execution and presentation.

REFERENCES:

1. Stage Design: A Practical Guide by Gary Thorne.
2. Theatre Design: Behind the Scenes with the Top Set, Lighting, and Costume Designers by Babak A. Ebrahimian.

Subject: INTRODUCTION TO ART AND ARCHITECTURE		
Code : ARE408-4	Credits : 2	Hours / Week: 2 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

AIM

To provide knowledge on exploring art forms, incorporate art forms into architecture.

OBJECTIVE

To analyze various art forms, and understand the techniques involved in creative thinking.

CONTENTS**UNIT-I**

3 hrs

Purpose and relevance of art

UNIT-II

4 hrs

Development of art; A survey of history of art forms; pre-historic period to the present times; Changing nature of art through time in terms of content; form and material;

UNIT-III

5 hrs

Exploration of art forms - study of traditional and contemporary art forms - painting sculpture, architecture, decorative arts, design arts, digital art. Relationship between art and architecture from earliest times.

UNIT-IV

10 hrs

Definitions and general understanding of architecture, role of architect in a building project. The changing role of architects, his relation with other consultants, contractors and client, technical knowledge and other skills required as inputs. Various subjects to be learnt by architecture students, their relevance to practice.

UNIT-V

10 hrs

Various factors influencing the architecture of a region, architecture as a response to social, technological and environment forces. Evolution of shelter forms in regions of the world and examples of vernacular architecture in the world, with particular reference to India.

TOTAL- 32 hrs

OUTCOME:

Students explore different materials, techniques, processes; developing creative products; finishing & presenting the product for the concepts evolved. Outcome will be through portfolio & presentations.

REFERENCES:

1. Craven, C. Roy. Indian Art a Concise History.
2. Kumar, Raj (Ed.). Essays on Indian Art and Architecture. Discovery Pub., New Delhi, 2003.
3. Fisher, E. Robert. Buddhist Art and Architecture. Thames and Hudson, London, 1993.
4. Ghosh, A (Ed.). Jain Art and Architecture Vol. 1-3. Bharatiya Jnanpith, New Delhi.
5. James C. Snyder, Introduction to Architecture, New York: Mc Graw Hill.
6. Christopher Alexander, Pattern Language, New York: Oxford University Press.
7. Thomas Mitchell, Redefining Designing: From to Experience,
8. James snyder and Anthony Y catanse, Introduction to Architecture, Mc Graw-Hill Book Company, New York, 1979.
9. Rapoport, Amos, House form & Culture.

SEMESTER –V

Subject : ARCHITECTURAL DESIGN - IV		
Code : ARS501	Credits : 12	Hours / Week: 12 hrs.
Progressive Marks : 60	Examination Marks : 40	Mode of Exam : Jury

AIM:

At the intermediate stage to graduate the student further on design of small complexes or buildings involving technology, structural clarity and services in terms of lighting, ventilation, movement pattern, fire safety, security, water supply, sewage etc, Thrust will be also on use of computer for presentation skills and introducing elements and detail for making building barrier free design.

OBJECTIVE:

- To train the student to gather knowledge on the given design project based on books / literature and websites.
- The students are to be exposed to expert lecture from expert architect, for each project or design.
- To make the student understand the complexity, functioning and salient features of the Integration of function: movement, climate, acoustics, structure and services into the building
- Landscaping and site planning.

DESIGN STUDIO:

Small complexes - concept of multi planning and circulation analysis - massing problems involving building technology, - Design and detailing for movement of physically handicapped and elderly persons within and around buildings.

Examples: Shopping centers (Commercial) Home for aged, Health centers, Nursing homes (institutional), Orphanage homes etc.

Introduction to three-dimensional modeling of spaces using Computer. Costruction and manipulation of three-dimensional building databases, Rendering 3 D images and Presentation techniques.

TOTAL - 192 hrs

REFERENCES:

1. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976.
2. P&D Act 1995.
3. E and O.E. Planning. Liffie Books Ltd., London, 1973.
4. National Building Code and Bureau of Indian standard publications.
5. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. – 2002.
6. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.

Subject : BUILDING MATERIALS & CONSTRUCTION - V		
Code : ART502	Credits : 6	Hours / Week: 6 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs

AIM:

The aim of the topic is to deal with principles, methods and construction practices of structural steel work

OBJECTIVES:

To introduce and expose students to various aspects involving roof coverings

- To introduce the use of steel for construction activity of buildings and structures

UNIT-I: ROOF COVERINGS

6 hrs

Introduction, requirements of roof, technical terms, classification, types of roof coverings for pitched roof. : Roofing tiles and roofing with cement products like A.C. sheet roofs, G.I. Sheets roofs, slates.

Miscellaneous Materials and treatments: Properties and uses of Asbestos, cork, felt, mica, adhesive, china clay, fiber glass, leather, canvass, jute, rubber, Asphalt and Bitumen

UNIT-II: MATERIALS FOR SPECIAL TREATMENTS

3 hrs

Insulation materials – thermal and sound insulation materials, acoustical treatment, Plastics such as polycarbonates, acrylics, PVC polymer films, FRP – types, properties and uses

UNIT-III: FOUNDATION OF STEEL STRUCTURES

12 hrs

Fabrication, erection, fixing of girders, stanchions, Roofing - Large Span Structure: Steel trusses of different spans, lattice girder, and north light glazing, AC sheet or GI sheet covering. Typical details tubular trusses, basic space frames.

UNIT-IV: INTRODUCTION TO PRE ENGINEERED STRUCTURES

6 hrs

Pre coated corrugated MS sheet roofing-crimping to make different curved roofs. Pre-cast concrete trusses: Advantages over steel trusses, truss with castellated girders, rain water disposal.

UNIT-V: ESCALATORS & ELEVATORS

6 hrs

Introduction to different types of elevators and escalators in structures like apartments, hospitals, shopping malls, airports

OUTCOMES:

- The students will be able to understand in detail the method of construction of various roof coverings with different materials, and building components using steel
- This also helps the student to understand the different construction practices adopted for the various components specific to the material in which it's made.

REFERENCE BOOKS

1. Chowdary, K.P. Engineering Materials are used in India, 7th ed. Oxford and IBH Pub. Ltd., New Delhi, 1990.
2. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
3. W.B. Mackey (vol – II) "Building Construction" ; B.C. Punmia "Engineering Materials"
4. Foster Stround Mitchee "Advanced Building Constructions"
5. Bindera and Arora. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub., New Delhi, 2000.

6. McKay J.K. Building Construction Metric Vol. 4, 4th ed. Orient Longman Pvt. Ltd., Mumbai, 2002.
7. Mitchell. Advanced Structures.
8. Rangwala, S.C. Engineering Materials: Material Science, 31st ed. Charotar Pub. House, Anand, 2004.

Subject : CONTEMPORARY ARCHITECTURE		
Code : ART503	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

OBJECTIVES:

- To provide an understanding of architecture from Industrial Revolution to the Modern movement and to study various Movements, Schools, Styles, and Influences.
- To orient the students to various developments in the field of architecture for a greater understanding of trends in contemporary architecture.
- To provide the student an in-depth knowledge of modern design philosophies in the evolution of innovative architectural forms and designs.
- To provide an understanding and appreciation of Contemporary trends in Indian and Western Architecture in terms of Ideas and directions through the works of outstanding architects.

CONTENTS:

UNIT-I: INDUSTRIAL REVOLUTION AND ITS IMPACT

7 hrs

Industrial revolution and its impact on the social, economic and political factors, its effects, new requirements of the society. New Materials and Technologies: Emergence of new building typologies - history of steel, glass and concrete.

UNIT-II: MODERN ARCHITECTURE

7 hrs

Historicism, Modernism, Utilitarianism and Functionalism, The Bauhaus, Organic Modernism, Brutalism, Chicago School, Formalism, Structuralism, Expressionism, Minimalism, Futurism, Postmodernism, Deconstructivism. Arts and crafts movement, Art Nouveau, Art Deco, Monumentalism, Expressionism.

UNIT-III: PHILOSOPHIES AND WORKS OF GREAT MASTERS

8 hrs

Le Corbusier, Frank Lloyd Wright, Walter Gropius, Louis Kahn and Mies Van Der Rohe.

UNIT-IV: PHILOSOPHIES AND WORKS OF INDIAN ARCHITECTS

8 hrs

BV Doshi, Charles Correa, Raj Rewal, Achyut Kanvinde, Uttam Jain, Laurie Baker, Anant Raje.

UNIT-IV: PHILOSOPHIES AND WORKS OF INTERNATIONAL ARCHITECTS

15 hrs

Oscar Niemeyer, Richard Meier, Charles Moore, Norman Foster, Santiago Calatrava, Renzo Piano, Bernard Tschumi, Frank Gehry, Zaha Hadid, Rem Koolhaas, Hassan Fathy, Geoffery Bawa, Richard Rogers, Tadao Ando, I.M. Pei, Kenzo Tange.

TOTAL- 45 hrs

OUTCOME:

Detailed understanding of the subject through historical analysis, group discussion and seminar. Students have to submit assignments, sketches, portfolios, model, etc.

TEXT BOOKS:

12. Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition), 1999.
13. G.K.Hiraskar, "Great Ages of World Architectur", Dhanpat Rai & Sons, Delhi.
14. Spiro Kostof, "A History of Architecture:Setting and Rituals, Oxford University Press, London, 1985
15. Francis D K Ching "Global History of Architecture"
16. Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
17. Emily Cole "Grammar of Architecture"

REFERENCES:

1. Bhatt, Vikram and Scriver, Peter. Contemporary Indian Architecture after the Masters. Mapin Pub. Pvt. Ltd., Ahmedabad, 1990.
2. Curtis, J.R. William. Modern Architecture since 1900. Prentice-Hall, Inc., New Jersey, 2002.
3. Jencks, Charles.The Language of Post-Modern Architecture, 4th ed. Academy Editions, London, 1984.
4. Frampton, K Tad Ando- buildings, Projects Writings, New York Rizzoli, 1984.
5. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London.
6. Sigfried giedion, Space time and Architecture: The Grwoth of a new tradition, Harvard University Press.
7. Manfredo Taferi / Franceso dal co, Modern Architecture, Faber and Faber/ Electa, 1980.
8. Lang, Desai, Architecture & Independence, Oxford University Press, New Delhi.
9. Sarbjit Bahga et all, Modern Architecture in India, Galgotia Publishing Company, New Delhi.
10. Morgan, Ann Lee & Taylor Colin "Contemporary Architecture" by
11. Bahga, Modern Architecture in India: Post Independence Perspective, Galgotia, 1993, New Delhi.
12. Hugh, Pearman, Contemporary World Architecture, Phaidon Press Ltd, 1998, Minneapolis.

Subject : BUILDING SERVICES – III (HVAC, LIFTS & FIRE SAFETY SERVICES)		
Code : ART504	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

The main aim of this course is to understand the utilisation of various types of lights indoor and outdoor and also to understand the application of acoustics principles in and around buildings.

OBJECTIVE:

- To list and explain the various components required in electricity distribution system in campus
- To identify the various types of light requirement for different purpose
- To design the lighting scheme for interiors spaces
- To explain the various characteristics of sound including origin, propagation and auditory sensation of sound.
- To distinguish the behaviour of sound for enclosed spaces and open spaces
- To identify the acoustical design criteria for theatres, cinema halls, auditorium, conference halls etc.

UNIT-I: BASICS OF ELECTRICALS

6 hrs

Sources of Electricity, Electricity generation, Basic Electrical Distribution System – Substation, transformer, over head line, underground line. Three phase supply. Electrical distribution in campus Domestic wiring system, Material, classification, merits and demerits, Electrical accessories, Symbols and representation in architectural layout drawings, Single line-wiring diagram, Safety aspects, protection of buildings against lightning, NBC Recommendations, Earthing, Short circuit and overloading, Preliminary Estimation of Electrical & illumination works

UNIT-II: LIGHTING

6 hrs

Fundamentals of light. Application of lighting and illumination in Architecture. Artificial sources of light; Lamps and their characteristics: Incandescent lamp, Fluorescent lamp, Gas filled lamp, HID lamp. Neon lamp and LED lamp.

UNIT-III: ILLUMINATION

6 hrs

Definition of Light power, light flux Light intensity, Laws of Illumination: inverse square law and Lambert's Cosine law. Application of law of illumination. General formula for illumination. Standard level of illuminations for various tasks, Basic lighting design, Direct, Indirect and semi-direct lighting. General and local lighting, Glare and glare control. Lighting design of: Residential units, Shops & Restaurants, general office, conference hall, Art – gallery and Museum Parks & playgrounds Road/area lighting and Landscape Lighting.

UNIT-IV: BASICS OF ACOUSTICS

6 hrs

Introduction to architectural acoustics - Characteristic and measurement of sound, frequency, intensity, decibel scale, auditory range, effects of sound on humans, loudness. Acoustics and acoustical environment, Behavior of sound in an enclosed space. Principle of geometrical acoustics, Different acoustical defects in auditorium and its solution, reverberation and reverberation time calculations – Sabine's formula and its interpretation, dead and live room.

UNIT-V: DESIGN OF AUDITORIUM

6 hrs

Size, shape, sitting arrangement design criteria for speech and music, acoustical correction design and modification techniques, broadcasting studio, television studio, classroom, lecture hall, church and Cathedral. Electro-acoustical systems, Unidirectional and Stereophonic sound system, Digital and Surround-sound systems, Design criteria for Theatres, Motion picture halls, Multiplexes and Multipurpose Auditoriums. Design of open-air theatre and planning of building.

UNIT-VI: NOISE CONTROL & ACOUSTICAL MATERIALS

6 hrs

Noise sources, air borne and structure borne sound, NC curve, Propagation of noise of mechanical operation and impact noise, sound transmission through wall and partition, Vibration isolation – control of mechanical noise, floor, wall, ceiling treatment. Design Principles- reduction of noise at the source, Reduction of noise near the source. Application of sound absorption material, Reduction of noise by Structural Defense. Planning and analysis of problem. Reduction of noise by Town Planning and Regional Planning consideration. General description of acoustical materials - acoustical tiles, fiberboard, resonator absorption unit absorber, carpets, acoustical plaster, resilient packing composite materials, etc. – Their use, selection criteria and construction.

TOTAL – 36 hrs

OUTCOME:

Electrical layout for buildings, market survey on electrical fittings and acoustical materials to understand the application and cost

REFERENCES:

1. Duncan Templeton; *Acoustics in The Built Environment*.
2. J E Moore; *Design for good Acoustics and noise control*.
3. Derek Philips; *Lighting in Architectural Design*.
4. G.K.Lal, *Elements of Lighting*, 3-D Publishers.
5. R.G. Hopkinson and J.D.Kay, *The lighting of buildings*, Faber and Faber, London, 1969.
6. Philips *Lighting in Architectural Design*, McGraw Hill, New York, 1964.
7. Burris, Harlod. *Acoustics for the Architect*.
8. Lord, Peter and Templeton, Duncan. *The Architecture of Sound: Designing*
9. Egan, David. *Architectural Acoustics*, MC Graw-Hill Book Ccompany, New York, 1988.

Subject : DESIGN OF RCC STRUCTURES – II		
Code : ART505	Credits : 3	Hours / Week: 3 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs.

AIM:

This course focuses on structural design of different elements of RCC buildings.

OBJECTIVE:

- To use limit state design for the analysis and design of columns.
- To use the limit state method for design of a concrete staircase.
- To enable the learning of design of structural elements like footings and retaining walls.
- To understand the principle, methods, advantages and disadvantages of pre stressed concrete.
- Case studies and models wherever applicable.

CONTENT:

UNIT-I: DESIGN OF COLUMNS

8 hrs

Design of columns subjected to uni-axial and bi-axial moment.

UNIT-II - DESIGN OF STAIR CASE

8 hrs

Introduction to different types of stair case. Design of dog legged stair case.

UNIT-III -DESIGN OF FOOTINGS

12 hrs

Introduction to different types of foundations, Design of Isolated, Combined and strip footing.

UNIT-IV: DESIGN OF RETAINING WALL

6 hrs

Introduction to retaining walls. Design of retaining walls

UNIT-V: INTRODUCTION TO PRESTRESSED CONCRETE

8 hrs

Principle of prestressing – methods of prestressing, advantages and disadvantages. Introduction to pretensioning and post tensioning of concrete

TOTAL – 42 hrs

OUTCOMES:

At the end of the course, the student should be able to:

1. Understand the different concepts in designing footings, columns and retaining walls using LSD methods.
2. Dog legged staircase design using LSD
3. Concepts of Prestressed concrete and applying them in real case.

TEXT BOOKS:

1. A.K.Jain. Reinforced Concrete: Limit State Design, 5th ed. New Chand and Bros., Roorkee, 1999.
2. Ramamrutham. S. and Narayan, R. Design of RCC Structures, 12th ed. Dhanpat Rai swPub. Co. Pvt. Ltd., Delhi, 1998.
3. B.C. Punmia, “Reinforced Concrete Structures”, Vol. 1 & 2, Laxmi Publications, Delhi, 2004.

REFERENCES:

1. P. Dayaratnam, “Design of Reinforced Concrete Structures”, Oxford and IBH Publishing CO., 1983.

2. N.C.Sinha and S.K.Roy, "Fundamentals of Reinforced Concrete", S.Chand and Co., New Delhi, 1983.
3. Krishna Raj, "Prestressed Concrete Structures", 3rd Edition, Tata McGraw Hill, 2005.

Subject : ENERGY EFFICIENT ARCHITECTURE		
Code : ART506	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To make the student understand the traditional techniques of construction for different climatic zones to make the building energy efficient

OBJECTIVES:

- To trace out evolution of energy conscious buildings and techniques from historic period based on climatic zone of the world.
- To enable students understand solar geometry and heat transfer mechanism in buildings and energy conservation.
- To familiarize the students with simple techniques for design considerations.

UNIT-I: CLIMATE AND SHELTER

6 hrs

Historic buildings - pre-industrial, post-industrial and modern architecture - examples from different climatic zones

UNIT-II: SITE PLANNING AND DEVELOPMENT

6 hrs

Landform - vegetation type and pattern - water bodies open spaces and built spaces – urban scape - design strategies. Significance of Energy Efficiency in the contemporary context, Simple passive design considerations involving Site Conditions, Building Orientation, Plan form and Building Envelope - Heat transfer and thermal performance of walls and roofs

UNIT-III: ADVANCED PASSIVE ARCHITECTURE- PASSIVE HEATING

8 hrs

Direct Gain Thermal Storage of Wall and Roof - Roof Radiation Trap - Solarium - Isolated Gain

UNIT-IV: PASSIVE COOLING

8 hrs

Evaporative Cooling - Nocturnal Radiation cooling - Passive Desiccant Cooling – Induced Ventilation - Earth Sheltering - Wind Tower - Earth Air Tunnels

UNIT-V: RENEWABLE ENERGIES

4 hrs

Innovation technologies for energy efficiency such as Photo Voltaic Cells, Battery Technology and renewable resources techniques such as solar energy, wind energy etc.

OUTCOMES:

- The students are exposed to different sources of energy and are exposed to passive design considerations
- Understanding the renewable source of energy and its importance to be incorporated in the addition to the built environment through cases studies and examples for Indian context.

TEXT BOOKS:

1. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999.
2. Arvind Krishnan & Others, “Climate Responsive Architecture”, A Design Handbook for Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001.
3. Majumdar M, “Energy-efficient Building in India”, TERI Press, 2000.
4. Givoni .B, “Passive and Low Energy Cooling of Buildings”, Van Nostrand Reinhold, New York, 1994.

REFERENCES:

1. Fuller Moore, "Environmental Control Systems", McGraw Hill INC, New Delhi – 1993.

Subject : WASTE MANAGEMENT AND RECYCLING		
Code : ARE507-1	Credits : 2	Hours / Week: 2 Hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 Hrs.

2. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, NewYork, 1996.
3. Patrick Waterfield, "The Energy Efficient Home: A Complete Guide", Crowood press ltd, 2011.
4. Dean Hawkes, "Energy Efficient Buildings: Architecture, Engineering and Environment", W.W. Norton & Company, 2002.
5. David Johnson, Scott Gibson, "Green from the Ground Up: Sustainable, Healthy and Energy efficient home construction", Taunton Press, 2008.

ELECTIVE - II**AIM:**

To convey waste management practices with a strong inclination towards environment and its alternative applications in the industry.

OBJECTIVES:

To provide knowledge about present practice and current scenario of different types of waste management

- To know about the segregations process and need for recycling
- To provide knowledge about sustainability and its approach
- To study about environment laws, rainwater harvesting, techniques, and alternative energy options

CONTENT:

UNIT-I: INTRODUCTION

4 hrs

Waste in built environment – Traditional practices of waste Management Current Scenario in India – Categorizations to solid, liquid and gaseous wastes – sectors responsible for waste generation.

UNIT-II: WASTE AND BUILT ENVIRONMENTAL

8 hrs

Solid and Liquid waste from residential and commercial buildings – Environmental significance – segregation and treatment of wastes – Industrial case studies – Experiments in construction industry – demolition – Role of NGOS in waste management.

UNIT-III: ALTERNATIVE BUILDING MATERIALS

6 hrs

Need for recycling industrial – byproducts as alternative building materials – use of fly ash, Furnace slag, Quarry dust, silica fume, waste lime and gypsum – Technology required for manufacturing – specification and application in construction industry.

UNIT-IV: RECYCLING OF WASTES

8 hrs

Meaning of sustainable approach – Identification and workability of waste - Concept of recycling Solid and Liquid wastes in building industry – Solid waste recycling, Vermi Composting, Biogas production – Liquid waste recycling methods and practices

UNIT-V: ENVIRONMENTAL MANAGEMENT AND ENERGY OPTIONS

4 hrs

Degradation of environment due to waste – Salient features of environmental laws – Rain water harvesting techniques - Biological and Thermal energy options – Refuse derived fuel and other options.

TOTAL - 30 hrs

OUTCOME:

- Students learn about present practice and current scenario of different types of waste management in India.
- They learn about the segregation process and recycling process
- They learn about sustainability and its approach

REFERENCES:

1. Ravindrarajah, R.S, Tam. T.C. Properties of concrete made with crushed concrete a coarse aggregate, - Magazine of concrete Research, Vol-37, and March 1985.
2. Arceivala. S.J., “Wastewater Treatment for pollution Control”- Tata-McGraw Hill, New Delhi, 1986.
3. ERM.UK Municipal Solid waste Management, Study for the MMA-Vol-1 Interim Report, August-1995.
4. R.Ambalavanan and A.Roja “Feasibility Studies on Utilisation of Wastelime, Gypsum with Fly Ash - The Indian concrete Journal – Vol. – 70 Nov-1996.

Subject: FURNITURE AND PRODUCT DESIGN		
Code : ARE507-2	Credits : 2	Hours / Week : 2
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

The course provides a framework in understanding the Theoretical, historical functional and human issues of the subject.

OBJECTIVE:

To impart a comprehensive understanding of the general theory and practice of the subject. To inculcate in student a natural curiosity in allied discipline of design.

CONTENTS:

UNIT-I 6 hrs
 Understanding of the functional and formal issues in design – study and evaluation of popular dictums such as “Form follows function”, form and function are one”, “Less is more”, “God is in details” etc. Evaluation of visual design for functional objects. Gestalt theory of design: Law of closure, law of proximity, law of continuity etc.

UNIT-II 4 hrs
 Human factors engineering and Ergonomic considerations; Principles of Universal Design and their application in furniture and product design.

UNIT-III 12 hrs
 An introduction of various manufacturing processes most frequently adopted in furniture and product design such as, Injection Moulding; investment casting, sheet metal work, die-casting, blow-moulding, vaccum – forming etc

UNIT – IV 4 hrs
 Signage and Graphics – Environmental graphics: signage categories and materials.

UNIT – V 12 hrs
 A detailed study involving the design aspects of any one of the following: Lifestyle accessories, Luminaire design, a piece of furniture, Point of Purchase design, Signage.

TOTAL – 38 hrs

REFERENCES

1. Héctor Roqueta. Product design, London: te Neues, 2002.
2. Morley, John. The history of furniture: twenty-five centuries of style and design in the Western tradition, Boston: Little, Brown and Company, 1999.
3. Aronson, Joseph. The Encyclopedia of Furniture, 6th printing, New York: Crown Pub. 1944.
4. Saville, Laurel. Design secrets: furniture, Gloucester, Mass.: Rockport Publishers, 2006.
5. Datschefski, Edwin. The total beauty of sustainable products, Hove: Rotovision, 2001.
6. Papanek, Victor J. The green imperative: natural design for the real world, New York: Thames and Hudson, 1995.

Subject : ARCHITECTURAL JOURNALISM AND PHOTOGRAPHY		
Code : ARE507-3	Credits : 2	Hours / Week: 2hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

AIM:

The Course prepares ground for the students to develop critical thinking and analyzing about the effects of architecture on society as well as the tools to enable recording of the same and develop the skill to create articles/presentation capturing the essence through the photographs.

OBJECTIVES:

- To provide basic introduction to the skills relevant to the practice of professional journalism.
- It introduces students to the fundamentals of writing, explaining of various strategies and their criticism.
- Introduction to Photo journalism and the contributions of photography to the professional practice of architecture and develop proficiency in this art using modern photography techniques.

CONTENTS:

UNIT-I: INTRODUCTION

6 hrs

Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, photography, columnists, public relationships, criticism. Issues such as copyright, public art policy, the arts and urban redevelopment. Introduction to local culture scene.

UNIT-II: TECHNOLOGIES IN JOURNALS

12 hrs

Environment, Social Change, Persuasion- Interviewing techniques, Argument and debate as a technique in the investigation of social problems; evidence, proof, refutation, persuasion; training in argumentative speaking. Introduction to software needed in journalism and photography, video coverage, walk-through of buildings, production of contemporary architectural journalism. Understanding the individual demands in the context of newspapers, radio, film, and television.

UNIT-III: CONTEMPORARY ARCHITECTURAL JOURNALISM

9 hrs

Role of the Editor - Editing of Articles, Features and other stories - Editing for online newspaper and magazines - Text preparation, Mode of presentation, Standards and Guidelines for documentation, Code of ethics, Basic knowledge on Press laws, Press Council of India, Multimedia/online journalism and digital developments.

UNIT-V: INTRODUCTION TO ARCHITECTURAL PHOTOGRAPHY

9 hrs

Introduction to architectural photography, history of architectural photography and role of the photographic image in the global world– basic instruction in Architectural Photography Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale–photo- finishing and editing digital images. Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions –Lighting: External and Interior. Photographic Practices – Realization, Light and Lighting, Exposure Metering and introduction to RAW format.

UNIT-IV: PHOTO JOURNALISM

9 hrs

Definition of Photo Journalism - Brief History - Photographs as social Documentaries - Birth of modern Photo Journalism since 1950s - visual awareness – visual survey - EDFAT methods in using the camera - Equipment required for Photo Journalism. Photo Journalism in perspective - Snap shots - Advance amateur Photography - Art Photography - Photo Journalism - Approach to Photo Journalism – News Papers and Magazine Design elements: Page make -up - Layout - color scheme - Font - Blurb - Pictures – Ads - Other magazines - Documenting of Places - Rural- Urban - Public relations.

TOTAL – 45 hrs

OUTCOMES:

Assignments should include an article based on ability to originate, plan, research, present and produce a piece of architectural journalism. The techniques and processes used in the production should be identified by the student.

Exercises can be framed by the faculty like Study and photograph the effects of an interior under different lighting conditions and at different times of day and night. This allows them to support the natural effects of the interior with a careful use of light.

TEXT BOOKS:

1. De Mare, Eric Samuel. Architectural photography, London: Batsford, 1975.
2. Edward Jay Friedlander and John Lee, “Feature Writing for Newspapers and Magazines”, 4th edition, Longman, 2000.
3. Kopelow, Gerry. How to photograph buildings and interiors, 3rd ed. New York: Princeton Architectural Press, 2002.
4. Fuller, David & Waugh, Patricia eds., “The Arts and Sciences of Criticism”, Oxford: Oxford University Press, 1999.

5. Mohd, Al Asad. Architectural Criticism and Journalism Sommer, Robert. Tom Wolfe on Modern Architecture.
6. Foust, James, Online Journalism, "Principles and Practices of News for the Web", Holcomb Hathaway Publishers, Scottsdale, AZ, 2005.
7. M. Harris, "Professional Architectural Photography", Focal Press, 2001.
8. M. Harris, "Professional Interior Photography", Focal Press, 2002.

REFERENCES:

1. Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005.
2. Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21, 2005.
3. M . Heinrich, "Basics Architectural photography", Birkhauser Verlag AG, 2008.
4. Gerry Kopelow, "Architectural Photography: the professional way", 2007Busch, Akiko. The photography of architecture: twelve views, New York: Van Nostrand Reinhold Co., 1987.

Subject : COST EFFECTIVE TECHNOLOGY		
Code : ARE507-4	Credits : 2	Hours / Week : 2
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To expose students into the cost effective materials and construction techniques.

OBJECTIVE:

To make the students aware of the use of conventional and non-conventional resources for cost effective construction techniques.

CONTENTS:

UNIT-I: INTRODUCTION

6 hrs

Introduction to cost effective buildings construction, techniques, system. Case study of cost effective building project.

UNIT-II: BUILDING TECHNIQUES

9 hrs

An introduction to the subject to understand the various building techniques adopted in different climatic zones of the country, which resulting in varied vernacular expressions. Use of cost effective technologies through the use of local materials, up gradation of traditional technologies, prefabrication etc.

UNIT-III: COST EFFECTIVE CONSTRUCTION

6 hrs

Need for cost effective construction, both in the rural and the urban sectors. Innovations of building techniques for cost effective construction. Analysis of space norms for cost effective buildings.

UNIT-IV: COST EFFECTIVE MATERIALS

12 hrs

Concepts of cost effective materials Soil, Fly ash, Ferro cement, Lime, Fibres, Stone Dust, Boulders and oversize metal, Bitumen etc.

Cost effective building material products :- (a) Walls – Stabilised and sun dried, soil blocks & bricks, Hollow concrete blocks, stone masonry blocks, Ferrocement partitions. (b) Roofs – Precast R.C. Plank & Joists roof, precast channel roof, Precast L-panel roof, Precast Funicular shells, Ferrocement shells, Filler Slab, Seasal Fibre roof, improved country tiles, Thatch roof.

UNIT-V: COST EFFECTIVE CONSTRUCTION TECHNIQUES AND EQUIPMENT

12 hrs

(a) Techniques: - Rat trap bond construction, Precast R.C. and Ferro cement technique, Mud Technology. (b) Equipments: Brick moulding machine, Stabilised soil block making machine and plants for the manufacturing of concrete blocks. (c) Cost effective Roads.

TOTAL – 45 hrs

REFERENCES:

1. Building System for Low Income Housing - A.K. Jain
2. Low Cost Housing in Developing Countries- G.C. Mathur
3. Alternative Building Materials and Technologies – By K S Jagadeesh, B V Venkatta Rama Reddy & K S Nanjunda Rao – New Age International Publishers
4. Integrated Life Cycle Design of Structures – By Asko Sarja – SPON Press
5. Non-conventional Energy Resources – By D S Chauhan and S K Sreevasthava – New Age International Publishers.
6. Buildings How to Reduce Cost – Laurie Backer - Cost Ford

SEMESTER - VI

AIM:

To enable student to confidently design large complex buildings and campuses, which involves structural synthesis, effective movement systems, within and around buildings, complying with all rules and regulations demonstrated in at least two large projects. Stress also shall be on making such buildings barrier free in terms of movement and details.

OBJECTIVES:

- Understand the design principle of campus planning and large scale projects
- Designs have to respond to climate environmental and ecological factors. Site planning, landscape details, circulation and services, structural viability and interiors have to be addressed.
- To make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings.

DESIGN STUDIO:

Design of large structures - Multiuser, multi-span, multilevel (six to eight floors) - building types involving technology and services – Design and detailing for movement and use by physically handicapped people within and around building.

Examples: Institutional, Resorts, IT hubs, Recreational - Mixed use Developments etc.

-Working drawings for any one design Using Computer for presentation Skills

TOTAL – 192 hrs

REFERENCES:

1. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. – 2002.
2. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.
3. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976. P&D Act 1995.
4. E and O.E. Planning. Lliffee Books Ltd., London, 1973.
5. National Building Code and Bureau of Indian standard publication

Subject : ARCHITECTURAL DRAWING & DETAILING		
Code : ART602	Credits : 6	Hours / Week: 6 hrs
Progressive Marks : 100	Examination Marks : NIL	Mode of Exam : NIL

AIM:

The aim is to impart skills related to the preparation of 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 with specific reference to code of practice as per IS Code No. 962 of 1969 and incorporating specifications as complementary to the working drawings.
- To sensitize the students in preparing finer design details required for buildings.

CONTENTS:

UNIT-I: FLOOR PLANS

20 hrs

Preparation of working drawings: Suitable scales of drawings, methods of giving dimensions: on plans, sections, elevations and other standards. Preparation of Plans Building marking plan, centerline plan, foundation plan, column centerlines drawings, floor plans, terrace floor plan.

UNIT-II: ELEVATIONS AND SECTIONS

12 hrs

Elevation and Sections, Detailed elevations, detailed sections, at least one through staircase and one through toilet, typical wall profile sections and elevations

UNIT-III: LAYOUTS

12 hrs

Furniture Layout, Electrical Layout, Sanitation and Water supply Layout

UNIT-IV: BUILDING COMPONENT DETAILS

15 hrs

Detailing of architectural elements such as staircase, balcony and verandah, shading devices vertical and horizontal components of the building

UNIT-V: DETAILS

15 hrs

Detailing of Doors, windows, and detailed plans, staircases, toilets and kitchens other fixing details, Compound walls, Grills and Balcony railing

TOTAL – 74 hrs

NOTE: The above drawings need to be prepared for one design project of any semester handled in an earlier Architectural design studio.

The drawings need to be prepared using any of the CAD techniques and final presentation to be submitted as a hardcopy.

OUTCOMES:

- The students will gain knowledge on understanding the types of drawings dealt on site.
- The students will understand about the detailed drawings and implementation

REFERENCES

1. Lerrs, Jack. Engineering Construction Specification.
2. Liebing, W. Ralph and Raul, Ford Mimi. Architectural Working Drawings, 2nd ed. John Wiley and Sons, New York, 1983.
3. Macey, W. Frank. Specification in Detail, 5th ed. Technical Press Ltd, London, 1955.
4. Shah, M.G., and Others. Building Drawing: with an integrated approach to build environment, 3rd ed. Tata McGraw Hill Pub., co. Ltd, New Delhi, 1996.
5. Lewis, R. Jack. Building Construction Specifications. Prentice-Hall, Inc., New Jersey, 1975.

6. Govt. of Maharashtra. Standard Specifications, Government Press, Nagpur, 1972.
7. Datta, B.N. Estimating and Costing in Civil Engineering: Theory and Practice, 23rd ed. UBS Pub. New Delhi, 1993.
8. Wakita, Osamu A. & Linde, Richard M. The professional practice of architectural detailing, 2nd ed. New York: Wiley, 1987.
9. Robert, C. Mc Hugh. Working Drawing Hand Book, New York: VNR, 1977.

Subject : INTERIOR DESIGN & DETAILING		
Code : ART603	Credits : 3	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 3 hrs

AIM:

To introduce the students to detailed study of History, principles and elements that go into making of an interior space more aesthetic, pleasing and functional with a few projects as practical.

OBJECTIVE:

- To provide emphasis on space planning process (block diagram, concept statement)
- To evaluate the historical process of style and proportion with creative integration of principles and elements
- To make the students understand Anthropometry and Ergonomics
- To enable a student to apply materials, colours and its implied factors like texture, furnishings, lighting etc
- To document a portfolio which involves free hand sketches, rendering on different softwares and exploration of varied graphic compositions

CONTENTS:

UNIT-I: INTRODUCTION AND HISTORY

9 hrs

Interior design process, Vocabulary of design in terms of principles and elements, Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.

Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc, Brief study of folk arts and crafts (Vernacular design in India) with reference to interior design and decoration.

UNIT-II: ELEMENTS AND PRINCIPLES WITH ANTHROPOMETRY

9 hrs

Elements: Line, shape, form, texture, color, value

Principles: Unity, harmony, rhythm, proportion and scale, movement, variety, repetition

Composition: Rules for interior layout construction drawings

Perspective: Basic one- and two-point perspective construction for interior architecture and furniture.

Study of Proxemics, Designing the size and form of interior spaces using user – activity, analysis and anthropometrics, effect of enclosure, fenestration, colour and lighting on perception of interior space, application of scale, proportion to enhance the quality of interior space, psychological effects of space.

Focuses on physical, psychological behavioural and human settings

UNIT-III: ELEMENTS OF ENCLOSING ELEMENTS

10 hrs

Introduction to various **elements of interiors** like floors. Ceilings, walls, staircases, openings, interior service elements. incidental elements etc. and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

UNIT-IV: APPLIED COMPONENTS OF INTERIOR SPACES AND THEIR TREATMENTS- COLOUR, LIGHTING AND LANDSCAPES

10 hrs

Colours in interiors – Colour Theory, Effect of light on colour, various colour schemes like analogues, complementary, triadic etc. Colour symbolism. Psychology of colour, Industrial colour codes. International standards

Interior lighting - different types of lighting - types of lighting fixtures- their effects and suitability in different contexts through change of levels and structural form modulation through artificial and natural lighting, emphasis of focal points and unity in interior design.

Interior landscaping elements: rocks, plants, water, flowers, fountains, paving, artifacts, etc., their physical properties and effects on spaces, plane and fixtures in relation to emphasis of background of space through change of levels and structural form modulation through artificial and natural lighting, emphasis of focal points and unity in interior design

UNIT-V: FURNITURE DESIGN

10 hrs

Furniture categories, exploration of the idea of furniture, role of furniture in interior design, Design approaches in furniture design. Brief overview of the evolution of furniture from Ancient to present: Various stylistic transformations. Furniture designers and movements.

Analysis of furniture in terms of human values, social conditions, technology and design criteria

Storage systems: Functional analysis of storage systems and thereby deriving types of cabinets needed for interior spaces – kitchen cabinets, wardrobes closets, book cases, show cases , display systems etc.

TOTAL - 48 hrs

OUTCOME:

Varied interior schemes of different functional types: Residential / Commercial/ Hotels and Cafes/ Office spaces/ Institutions at different scales will form the major design assignments. Focus is on Portfolio creation by producing a complete and correct set of working drawings, from plans through details and specifications with material samples

TEXTBOOKS:

1. Francis.D. Ching & Corky Bingelli, Interior Design Illustrated, 2nd edition, Wiley publishers, 2004.
2. Julius Panero & Martin Zelnick, Human Dimension & Interior Space: A source book of Design Reference standards, Watson – Guptill, 1979.
3. Maureen Mitton, Interior Design Visual Presentation: A Guide to Graphics, Models, and Presentation Techniques. John Wiley and Sons, 2003
4. Mark.W. Lin, Drawing and Designing with Confidence: A step-by-step guide, Wiley and Sons, 1993.
5. Robert Rengel, Shaping Interior Space, Fairchild Books & Visuals ,2002
6. “Human Dimension and Interior Space” by Panero Julious & Zelink Martin
7. “Design of Interior Environment” by Alexander and Mercourt
8. “Interior Design Illustrated” by Francis D K Ching and Corky Binggeli

REFERENCES:

1. Steport - De Van Kness, Logan and Szebely, *Introduction to Interior Design* Macmillan Publishing Co., NY 1980.
2. *Inca / Interior Design Register*, Inca Publications, Chennai, 1989.
3. Kathryn .B. Hiesinger and George H.Marcus, *Landmarks of twentieth Century Design*; Abbey Ville Press, 1993.
4. Syanne Slesin and Stafford Ceiff - *Indian Style*, Clarkson N. Potter, Newyork, 1990.
5. The Impulse to adorn - *Studies in traditional Indian Architecture* - Editor Dr.Saranya Doshi, Marg Publications, 1982.

Subject: ECOLOGY AND LANDSCAPE		
Code : ART604	Credits : 2	Hours / Week: 3 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

This course introduces students to landscape design and site planning and relate it to design and planning of built environments. It provides an overview of development of landscape design, site studies, plant studies and application of the knowledge at various levels of design.

OBJECTIVES:

- To develop a conceptual understanding of landscape design and site planning principles.
- To develop skills in integrating landscape design with built environments.

CONTENTS:

UNIT–I: INTRODUCTION & EVOLUTION

6 hrs

Introduction to landscape Architecture and Role of Landscape design in built environment. Introduction and History of Landscape Architecture. A brief review of Landscape Design and garden design in history in various regions Persian, Spanish, Italian, French, Moghul, English, Japanese Garden styles. Changing perception of mans relationship with nature in various phases of history and its influence on environment.

Evolution of concepts in landscape design after the industrial revolution leading to new theories in integrating built spaces to open spaces. Increasing awareness of ecological variables in landscape design.

UNIT-II: SITE PLANNING & PHILOSOPHIES

12 hrs

Site Studies and Site Planning Principles of site Planning and land use; review of definition applied in typical landscape development situations. Site survey and appraisal – understanding different site characteristics – topography, vegetation, Hydrology, Access, Surroundings etc. documents, site characteristics and establishing relationship with design / Architecture programme requirements. Role of landscape components in modifying micro climate with respect to temperature, humidity, precipitation and percolation. Philosophical and design issues related to site development – siting of buildings, spatial and contextual relationships of built and outdoor space and circulation, site and its relationship to surroundings. Importance of climate and social factors in development of site. Process of design development. Identifying functional requirements of site. Development of site by mutual exploitation of forms and use of grading principles.

UNIT-III: PLANTS & DESIGN

6 hrs

Plants and Design - Introduction to study of plants in relation to landscape design and architecture. An overview of use of plants in history. Study of Plant material – Botanical Nomenclature anatomy and physiology of plant growth study of trees, shrubs, ground cover, indoor plants in Indian context.

Design with plants – Basic principles of designs. The physical attribute of plants and relation to design. Appearance, functional and visual effects of plants in landscape design and built environment, Selection and management of plant material in relation to built environment.

UNIT-IV: ELEMENTS OF LANDSCAPE DESIGN

6 hrs

Elements in Landscape Design - Use of landform, water and vegetation in landscape design. Hard landscapes: design of paths, roadways streets, terraces etc and use of land form effectively. Soft landscapes: design of lawns, shrubs, hedges, trees – in relation to buildings and other landscape elements.

Design concepts related to use of sculpture, outdoor lightings, Architectural feature, street furniture and grouping them into meaningful compositions for visual and functional effects.

UNIT-V: LANDSCAPE CONSTRUCTION & SERVICES

6 hrs

Landscape Construction and Services - Study of landform its technical expression through grading plan, sections and earthwork computations. Irrigation systems – sprinkler trickle irrigation, drip irrigation and laying irrigation networks. Construction of structure in landscape circulation roads, parking, paths, level changes – walls, steps lamps, construction of screens, trellis, wall fences gales decks, pools etc.

UNIT-VI: CONTEMPORARY & INTERIOR LANDSCAPE DESIGNS

12 hrs

Contemporary concepts and concerns Contemporary attitude to development and design of open spaces – Urban landscape, Parks, Rural landscape etc. Introduction to concepts of green architecture and micro climate planning.

Interior landscape architecture: Interior landscapes in historical perspective. Indoor planting design considerations: criteria for selection of plants, texture, colour, habits and height. Use and behaviour of plants in interiors, Interior courtyards, etc.

TOTAL - 48 hrs

OUTCOMES:

An Understanding on the study of landscape architecture as a process and also to provide an overview of various approaches and concepts.

- Site analysis and planning – To deal with large scale projects and master planning
- Design – Learn how to design landscape along with built environment

EXERCISES:

Each unit can entail a small design studio exercise so that the students can get better understanding of the topics or any other relevant exercises appropriately framed by the subject faculty.

For example:

Unit I – Study the different influences of historical gardens in modern day landscapes

Unit II – Document the site analysis for a large scale project like an institution or office building and propose a master plan.

Unit III – Design a garden only using plant material in various climatic conditions and zones

Unit IV – Design a terrace garden or roof garden using the various elements only

Unit V – Grading exercise to create a natural looking water body.

REFERENCES:

1. Michael Laurie, *an Introduction to Landscape Architecture*, Elsevier, 1986.
2. Geoffrey and Susan Jellicoe, *the Landscape of Man*, Thames and Hudson, 1987.
3. TSS for *Landscape Architecture*, Mc Graw Hill ,Inc, 1995
4. Grant W Reid, *From Concept to Form in Landscape Design*, Van Nostrand Reinhold Company, 1993.
5. Brian Hacket, *Planting Design*
6. T.K. Bose and Chowdhury, *Tropical Garden Plants in Colour*, Horticulture and Allied Publishers, Calcutta, 1991.
7. Ian McHarg, *Design with Nature*, 1996

Subject : DESIGN OF STEEL STRUCTURES		
Code : ART605	Credits : 3	Hours / Week: 3 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 3 hrs

AIM:

To understand the Structural Design of different elements of Industrial Building in Steel

OBJECTIVES:

- To enable the understanding of the types, efficiency and strength, advantages and disadvantages of Rivet and welded joints in steel.
- Students will get to know about various member connections.
- Case studies and models wherever applicable.

UNIT-I: STEEL ROOF TRUSSES

8 hrs

Types of roof trusses – Selection of trusses according to the span – Estimation of gravity loads and wind loads – Use of BIS and book SP-38 in analyzing and design of trusses – gusseted plate connections. (Theory Only)

UNIT-II: DESIGN OF FASTENINGS

6 hrs

Design of bracket connection, Riveted and Welded connection

UNIT-III: DESIGN OF PURLINS

6 hrs

Design of Purlins considering dead load, live load, snow load and wind load

UNIT-IV: ARCHITECTURAL DRAWINGS OF STEEL STRUCTURES

22 hrs

Beam to beam members, Beam to column members, Steel column footing.

TOTAL- 42 hrs

OUTCOME:

- Tension members are designed for various conditions by applying the codal provisions.
- Able to design the steel joints for maximum efficiency and strength.

- Able to design purlins considering various loads.
- Submit the plates with a detail understanding of steel members.

TEXT BOOKS:

1. **Ram Chandra.** Design of Steel Structures Vol. I, 10th ed. Standard Book House, Delhi, 1999.
2. **Dayaratnam, P.** Design of Steel Structures. Wheeler Pub., Allahabad, 1992.
3. **Ramamrutham, S. and Narayanan, R.** Design of Steel Structures, 4th ed. Dhanpat Rai and Sons, Delhi, 1995.
4. **N. Subramanian,** “Design of Steel Structures”, Oxford Higher Education, 2008

REFERENCES:

1. **S.K. Duggal,** “Limit State Design of Steel Structures”, McGraw Hill Education, Private Limited, 2010.
2. **Dr. V. L. Shah,** Prof. Veena Gore, “Structures Publications”, Pune, 2012.
3. **S.S. Bhavikatti,** “Design of Steel Structures” by Limit State Method as per IS800-2007, I.K. International Publishing House Pvt, Ltd, 2012.
4. **IS** (Indian Standard codes).

Subject : ESTIMATION, COSTING & VALUATION		
Code : ART606	Credits : 2	Hours / Week: 3Hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

AIM:

To provide the in depth knowledge about various methods of quality surveying, rates analysis of building and valuation and specifications for different materials used.

OBJECTIVES:

- To provide the knowledge about importance of specification, how to write specification – important aspects of the design of a specification.
- To know the concept of abstract and detailed estimates based on measurement of materials and works.
- To provide knowledge about cost control and about valuation and depreciation
- Writing feasibility report of a project.

CONTENT:

UNIT-I: SPECIFICATION

8 hrs

Definition, purpose and importance of specifications, General or brief specifications, Detailed specifications, writing of specifications, for items like earthwork excavations, foundation, CRS masonry, DPC, PCC, RCC, brickwork, doors and windows (wooden), mortars, plaster, painting, flooring like terrazzo flooring and tiles, ceramic tiles, marble, granite, distemper, snowem, glazing, specification, writing to include materials, tests pre and post installation, modes of measurements.

UNIT-II: ESTIMATION

5 hrs

Types & purpose, approximate estimate of buildings – Bill of quality, factors to be considered, Principles of measurement and billing, contingencies, measurement of basic materials like brick, Wood, concrete and unit of measurement for various items of work – abstract of an estimate.

UNIT-III: DETAILED ESTIMATE

14 hrs

Deriving detailed quantity estimates for various items of work of a building. Like earthwork excavation, brick work, plain cement concrete, Reinforced cement concrete works, wood work, iron works, plastering, painting, flooring, weathering course for a single storied building.

UNIT-IV: RATE ANALYSIS

9 hrs

Cost of materials and labour for various works, data sheet for different items of works, different methods of execution i.e. piece work, daily basis, lump sum, labour rates and percentage etc.

UNIT-V: VALUATION

6 hrs

Introduction- state the purposes of valuation of building explain the terms, market value, book value, capital cost, capitalized cost, years of purchase, list out various methods of estimating the depreciation of building properties, calculate the value of the property by different methods.

Methods of contracting and its link to specification drafting - the Business Environment and the Structure in practice.

TOTAL - 42 hrs

OUTCOMES:

- Students learn the art of building construction through specification writing.
- Students learn to work out the approximate estimate, detailed estimate for small scale building projects and low cost housing.

TEXT BOOK:

1. S.C. Rangwala, "Estimating, Costing and Valuation(Professional practice)", 1984
2. B.W. Dutta, "Estimating & Costing" (Revised by S. Dutta), UBS Publishers Distribution P.Ltd. India, 1983
3. M. Chakraborti, "Estimating Costing and Specification", 1984
4. Gurcharan singh & Jagdish singh, "Estimating Costing and Valuation", Standard Publishers Distributors, 2012

REFERENCES:

1. T.N. Building practice, Vol:1 Civil Govt Publication.
2. PWD Standard Specifications. Govt Publication, 2012.

Subject : SUSTAINABLE ARCHITECTURE		
Code : ARE607-1	Credits : 2	Hours / Week: 2 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

ELECTIVE -III

AIM:

To make the student understand the challenges, strategies of sustainability, materials to use and future trend for sustainable development.

OBJECTIVES:

- To inform the need to use alternative sources of energy in view of the depleting resources and climate change.
- To familiarize the students with simple and passive design considerations
- To inform about the importance of day lighting and natural ventilation in building design
- To make the students aware of the future trends in creating sustainable built environment.

UNIT-I: INTRODUCTION TO SUSTAINABLE ARCHITECTURE 6 hrs

Definition of sustainable architecture, need, scope & study of, Natural resources & their interrelationship, Historical Perspective: Natural & Physiological factors influencing human civilizations & Settlements

UNIT-II: CHALLENGE OF SUSTAINABLE DEVELOPMENT 6 hrs

Introduction to sustainability, its historical precedence global & local relevance - its correlation to population growth & consumption patterns Human Impact on Earth sustainability: Impact of human civilization on the earth's major ecosystem forests, oceans, & atmosphere;

UNIT-III: STRATEGIES FOR SUSTAINABILITY 4 hrs

Principles of conservation & efficiency as applied to space, energy and material resources; Global treaties & action plans; sustainable role models such as eco-villages; environmental education

UNIT-IV: SUSTAINABILITY APPLICATIONS TO ARCHITECTURE AND PLANNING 6 hrs

Sustainable Architecture and Planning. Preserving and improving the human settlement in harmony with nature. Conservation of natural resource for improving the quality of life on earth and attempting to ensure its continuity for the future of humanity. Eco cities, eco-communities and eco buildings: Archeology. Designing settlements and other man-made eco-systems. Ecological and environmental cities for sustainable future.

UNIT-V: USE OF SUSTAINABLE MATERIALS 4 hrs

Interior materials Green materials and Construction Technology Insulation, paint, wiring; Smart building systems, Technical Standards & Certifications systems: Types of certification systems worldwide – LEEDS, BREEAM, ECOTEL, GREEN GLOBE, ENERGY STAR etc.

UNIT-VI: CONTEMPORARY AND FUTURE TRENDS 6 hrs

Areas for innovation in improving energy efficiency such as Photo Voltaic Cells, Battery Technology, Thermal Energy Storage, Recycled and Reusable Building materials, Nanotechnology, smart materials, and the future of built environment, Energy Conservation Building code.

TOTAL - 32 hrs

OUTCOMES:

- The students are exposed to alternative sources of energy and are exposed to passive design considerations
- An understanding on day lighting and natural ventilation in design in addition to the future trends in creating sustainable built environment
- Case study examples of various local national and global project of sustainable architecture

REFERENCES:

1. Fuller Moore, Environmental Control Systems, McGraw-Hill, Inc., New Delhi, 1993.
2. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi - 1995.
3. Ms.Sudha, N.K.Bansal and M.A.S.Malik - Solar Passive Building - Pergamon Press.
4. V.Gupta - Energy and Habitat - Wiley Eastern Limited, New Delhi.
5. Donald Watson, Climatic Building Design.
6. PLEA SPA - Climatically Responsive Energy Efficient Architecture - New Delhi - 1995.
7. A.Konya, Design Primer for Hot Climates, Architectural Press, London, 1980.

WEBSITES

www.terin.org/

<http://solstice.crest.org/efficiency/index.shtml>

<http://www.envinst.conu.edu/~envinst/research/built.html>

Subject : CONSTITUTION OF INDIA		
Code : ARE607-2	Credits : 2	Hours / Week: 2 hrs.
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs.

AIM:

To make students to understand the constitution of Indian- various functions and role of important authorities

OBJECTIVE:

Introduction to the Constitution of India

UNIT-I: EVOLUTION OF CONSTITUTION OF INDIA

6 hrs

UNIT-II: DIRECTIVE PRINCIPLES OF STATE POLICY 8 hrs
 Relevance of Directive Principles of State Policy under Part IV.
 Significance of Fundamental Duties under part IV (a)

UNIT-III: ROLES AND FUNCTIONS OF AUTHORITIES 6 hrs
 Union Executive, President, Vice-President, Prime Minister, Council of Ministers, Parliament and Supreme Court of India. State Executive, Governor, Chief Minister, Council of Ministers, Legislature and High Courts. Constitutional provisions for scheduled castes and tribes; women and children and backward classes.

UNIT-IV: 6 hrs
 Emergency Powers, Major Constitutional Amendments.

UNIT-V: 6 hrs
 Electoral Process

TOTAL – 32 hrs

OUTCOME:

Understanding the constitutional laws of india, fundamental right of citizen and role and importance of different authorities.

REFERENCE BOOKS:

1. “Introduction to the Constitution of India (Student Edition)” by Durga Das Basu
2. “Constitution of India – Latest Edition” by VN shukla

Subject : THEORY OF DESIGN		
Code : ARE 607-3	Credits : 2	Hours / Week: 2 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam : 2 hrs

AIM:

The courses in design theory aim to evolve a conceptual framework for intelligent appreciation of Architecture and to develop a vocabulary for discussing design ideas.

OBJECTIVES:

- To understand design and the role of the designer in changing society.
- To familiarize the students with methodologies, theories and models of the design process.
- To inform students about the term creativity and introduce techniques which will enable creative thinking.
- To inform the approaches to generate ideas for architectural design and the importance of the participatory approach to design.

CONTENT:

UNIT-I: INTRODUCTION TO DESIGN

2 hrs

Definition and understanding of design- design in history - changing role of designer on society - different classifications of design according to scale, process, mode of production, etc.

UNIT-II: DESIGN METHODOLOGY MOVEMENTS

10 hrs

Context for the rise of the design methodology movement- theories of the first generation and the second generation design methodologists- various models of the design process- focus on the design problem: ideas of escalation/regression and wicked problem.

UNIT-III: CREATIVE THINKING

8 hrs

Understanding the term creativity- theories on thinking: left brain/ right brain, convergent and divergent thinking, lateral and vertical thinking- design spectrum from the logical to chance - Blocks in creative thinking- various techniques to generate creativity

UNIT-IV: ARCHITECTURAL CREATIVITY

9 hrs

Design puzzles and traps - approaches to generate ideas for architectural design - types of Concepts - personal philosophies and strategies of individual designers - channels to creativity in architecture. Value judgments in design. Appreciation of designer skills, theories of perception and variability of perception

UNIT-V: DESIGN AND PEOPLE

3 hrs

Concept of pattern language- participatory approach to design - design as process

TOTAL - 32 Hrs

OUTCOME:

An ability to think about architecture as one of the many fields under the broader ambit of design as a fundamental human activity.

TEXT BOOKS:

1. Geoffrey Broadbent, "Design in Architecture, Architecture and the Human sciences", John Wiley & Sons, New York, 1981.
2. Bryan Lawson, "How Designers Think", Architectural Press Ltd., London, 1980.
3. Anthony Antoniades, "Poetics of architecture", Theory of design, John Wiley & sons, 1992.
4. Paul - Alan Johnson, "Theory of Architecture: Concepts, Themes", Wiley 2008 VNR, 1994
5. Christopher Alexander, "Pattern Language", Oxford University Press, 1977

REFERENCES

1. Edward De Bono, "Lateral Thinking", Penguin, 1990.
2. Christopher Jones "Design methods", Wiley, 1980.
3. Tom Heath, "Method in Architecture, John Wiley & Sons, New York, 1984.
4. Nigel Cross, "Developments in Design Methodology", John Wiley & Sons, 1984.
5. Helen Marie Evans, Dumesnil, Carla Davis, "An Invitation to Design", Macmillan Publishing Co., New York, 1982.

Subject : STRUCTURE AND ARCHITECTURE		
Code : ARE607-4	Credits : 2	Hours / Week: 2 hrs
Progressive Marks : 60	Examination Marks : 40	Duration of Exam: 2 hrs

AIM:

To study the structural construction methods during industrial era, present and future trends in different regions of world.

OBJECTIVES:

- To study evolution of structural systems through history.
- To familiarise the students with concepts of structural design through works of architects/ engineers.
- To study architectural expression through relevant case studied.
- To evaluate the understanding of the relationship between form & structure through a seminar.

CONTENT:

UNIT-I: HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA

4 hrs

Development of monolithic and rock cut structures- trabeated construction-arcuate construction
Vaults and flying buttresses- tents and masted structures and bridges through ancient and medieval history.

UNIT-II: HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD

4 hrs

Post Industrial modular construction of large span and suspension structures in steel and concrete-
projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and Eero Saarinen.

UNIT-III: CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – I 9 hrs

The select case studies could include KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Centre and Swindon UK by Norman Foster and Standsted Airport Terminal, London, UK by Foster/Arup British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal by Nicholas Grimshaw

UNIT-IV: CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY – II 9 hrs

The select case studies could include Inmos Microchip Factory, Centre Commercial St. Herbtain, PA Technology, Princeton and Fleetguard, Quimper UK by Richard Rogers Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich Schweiz by Santiago Calatrava Kansai International Airport, UNESCO Workshop, the Jean-Marie Tjibaou Cultural Center, Menil Museum, Thomson Optronics Factory, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa Italy and Lowara Officers, Montecchio Maggiore Italia by Reno Piano Building Workshop

UNIT-V: SEMINAR 6 hrs

Seminar to present a study of architectural form and structural expression through select cases which will aid understanding of structural philosophy and analysis, building envelope and services and construction sequence.

TOTAL – 32 hrs

OUTCOMES:

1. The student will understand and familiarize the concepts of structural design and its impact/ functional dimension in the architectural design of the historic and contemporary buildings.
2. The student will be acquainted with the architectural expression, its relation between form and structure through relevant case studies.

TEXT BOOKS:

1. Shigeru Ban,McQuaid, Matilda, Engineering and Architecture: Building the Japan Pavilion, Phaidon Press Ltd, UK, 2008
2. Cox Architects, The images publishing group, Australia, 2000
3. Masted structures in architecture, James B Harris, architect. Kevin Pui-K Li, Oxford; Boston : Architectural Press, 2003

REFERENCES:

1. Martorell, Bohigas & Mackay, Pavilion of the Future, Expo 92, Seville (MBM), 1992.
2. P. COX, Daring Harbour Expo Center, Sydney Australia
3. Enric Miralle & Carme Pinos, Olympic Archery Building, 857072 COH
4. Prada Aoyama Tokyo Herzog & De Meuron. Milan,IT: Progetto Prada Arte Srl, 2003
5. Christopher Beorkrem, Material Strategies in Digital Fabrication, Routledge,Taylor & Francis Group, 2013