ADHIYAMAAN COLLEGE OF ENGINEERING (AUTONOMOUS), HOSUR
DEPARTMENT OF ARCHITECTURE
ACADEMIC YEAR 2017 - 2018

1.3.1 Course Table (Only the Courses offered in the current academic year)

S.No	Programme Code	Programme Name	Course code	Course Name	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development	Year of Introduction	Class
1	B ARCH	ARCHITECTURE	115ART04	Materials and Construction – I	Employability/Skill Develoment - Expose the student to different materials of construction, components and elements of buildings and integrate in the small design spaces of regional context.	2015 - 16	I YEAR ARCH A & B
2	B ARCH	ARCHITECTURE	115ART05	Architectural Graphics - I	Employability/Skill Develoment - Enable students the basics of architectural graphics in terms of both two dimensional and three dimensional drawing and use these skills in design communication.	2015 - 16	I YEAR ARCH A & B
3	B ARCH	ARCHITECTURE	115ARP06	Art Studio	Employability/Skill Develoment - Enhance free hand drawing as a means to communicate and to train the students to sketch and render natural forms, built forms and presentation drawings manually in various media.	2015 - 16	I YEAR ARCH A & B
4	B ARCH	ARCHITECTURE	115ARP07	Design Studio - I	Employability/Entrepreneurship/Skill Develoment - Sensitize students to different material both planar and train them in visual composition using two dimensional and three dimensional objects and to develop aspects of visual perception.	2015 - 16	I YEAR ARCH A & B
5	B ARCH	ARCHITECTURE	115ARE01	Personality development	Employability/Entrepreneurship/Skill Develoment - Build confidence and inculcate various soft skills and to help Students to identify and achieve their personal potential to develop qualities suited for profession.	2015 - 16	I YEAR ARCH A & B
6	B ARCH	ARCHITECTURE	115ARE02	Art appreciation	Employability/Skill Develoment - Explore the relationship between materiality & space, between building, the environment and culture and to initiate an understanding of abstraction and analysis of space and form and emphasis on connoisseurs of art rather than consummate artists themselves.	2015 - 16	I YEAR ARCH A & B
7	B ARCH	ARCHITECTURE	215ART01	Mechanics of Structures – I	Employability - Sensitize students on how structural resolutions become important in realization of architecture design concept.	2015 - 16	I YEAR ARCH A & B
8	B ARCH	ARCHITECTURE	215ART04	Materials and Construction – II	Employability/Skill Develoment - Focus on the construction techniques, detailing of timber products and their applications applications and various components through scaled drawings.	2015 - 16	I YEAR ARCH A & B

9	B ARCH	ARCHITECTURE	215ART05	Architectural Graphics-II	Employability/Skill Develoment - Development of visual representation and conceptual communication in the field of spatial design through 3D drawing techniques with applicable renderings that include shades and shadows	2015 - 16	I YEAR ARCH A & B
10	B ARCH	ARCHITECTURE	215ARP06	Computer Studio I	Employability/Skill Develoment - Develop skills required in using computers as a tool for architectural design representation	2015 - 16	I YEAR ARCH A & B
11	B ARCH	ARCHITECTURE	215ARP07	Design Studio - II	Employability/Entrepreneurship/Skill Develoment - Thrust for the design is on the spatial organization with respect to anthropological space standards including physically challenged.	2015 - 16	I YEAR ARCH A & B
12	B ARCH	ARCHITECTURE	215ARE03	Design Fundamentals in Architecture	Skill Development - Implemented the design ideas as a tool of communication and for info graphical presentation and develop a sense of visualization of spaces with sketches, models, drawings and computer tools.	2015 - 16	I YEAR ARCH A & B
13	B ARCH	ARCHITECTURE	215ARE04	Communication skills	Skill Develoment - Develop skills in effective communication – both written and verbal and explore the potential of media technology and the Internet to enhance communication.	2015 - 16	I YEAR ARCH A & B
14	B ARCH	ARCHITECTURE	315ART01	Mechanics of Structures – II	Employability - Exposed to behavioral of structral elements and implement the analysis in the design problems.	2016 - 17	II YEAR ARCH A & B
15	B ARCH	ARCHITECTURE	315ART03	Climate Responsive Architecture	Employability - Equip the students with scientific background required to design climate responsive buildings, and its climate responsive considerations in architectural design of building and built up areas.	2016 - 17	II YEAR ARCH A & B
16	B ARCH	ARCHITECTURE	315ART04	Environmental Sciences and Engineering	Employability - Gain knowledge on the application of concrete in different buildings and construction industry to support the design from foundation to structural details.	2016 - 17	II YEAR ARCH A & B
17	B ARCH	ARCHITECTURE	315ART05	Materials and Construction – III	Employability/ Entrepreneurship/ Skill Development - Enable students to develop their design with the help of computation and presentation software to get the output of 2D and 3D model construction.	2016 - 17	II YEAR ARCH A & B
18	B ARCH	ARCHITECTURE	315ARP06	Computer Aided Design Studio II	Employability/ Entrepreneurship/ Skill Development - Students will have a holistic understanding of the built environment as a complex entity shaped by social, economic and geographical factors and design a small scale project different users.	2016 - 17	II YEAR ARCH A & B

19	B ARCH	ARCHITECTURE	315ARP07	Design Studio - III	Employability/Entrepreneurship/Skill Develoment - Thrust area for specialization in design shall be on cost effective, vernacular, eco, green or sustainable technologies and visual characteristics of a settlements at micro level.	2016 - 17	II YEAR ARCH A & B
20	B ARCH	ARCHITECTURE	315ARE02	Modular co-ordination	Employability - Enable students to understand the pre-plugged design and prefab strcutures and meet the need of the growing construction industry.	2016 - 17	II YEAR ARCH A & B
21	B ARCH	ARCHITECTURE	315ARE04	Vernacular Architecture	Skill Development - Development of significant contribution of vernacular architecture of place in fabric of that city or region.	2016 - 17	II YEAR ARCH A & B
22	B ARCH	ARCHITECTURE	415ART01	Analysis & Design of Structures – I	Employability - Enable students to understand on steel and reinforced concrete structures to achieve various design of RC slabs supporting the design need.	2016 - 17	II YEAR ARCH A & B
23	B ARCH	ARCHITECTURE	415ART03	Site Planning & Analysis	Employability/Skill Develoment - Insight about the process involved in analyzing the given site and its parameters and help students in evolving a design solution which responds to any given environment.	2016 - 17	II YEAR ARCH A & B
24	B ARCH	ARCHITECTURE	415ART04	Building Services I	Employability - Sensitize students that efficiency of building function also depend on integration of services like water supply and sewage disposal system, and implement in the schematic layout of simple domestic and office buildings.	2016 - 17	II YEAR ARCH A & B
25	B ARCH	ARCHITECTURE	415ART05	Materials and Construction – IV	Employability/Skill Develoment - Develop knowledge to the students of steel and their wider application in the building industry.	2016 - 17	II YEAR ARCH A & B
26	B ARCH	ARCHITECTURE	415ARP06	Design Studio - IV	Employability/Entrepreneurship/Skill Develoment - To explore the spatial organization related socio-cultural aspects and implement principles of climatic responsive architecture.	2016 - 17	II YEAR ARCH A & B
27	B ARCH	ARCHITECTURE	415ARE01	Energy Efficient Architecture	Employability - Incorporate energy efficient techniques in planning, design and detailing of buildings	2016 - 17	II YEAR ARCH A & B
28	B ARCH	ARCHITECTURE	415ARE03	Ergonomics in Building Design	Skill Develoment - Explore metrological analysis of the anthropometrics relationship to ergonomic environmental design.	2016 - 17	II YEAR ARCH A & B
29	B ARCH	ARCHITECTURE	515ART01	Analysis & Design of Structures - II	Employability - Gain knowledge on structural understanding of steel as a material in the building industry and contributes to the design and detailing skills of the student.	2017 - 18	III YEAR ARCH A & B

30	B ARCH	ARCHITECTURE	515ART03	Interior Design Principles	Employability/ Skill Development - Explore the ways & means of developing interior spaces proceeding from a general discussion of architectural space to the particular characteristics of interior space in 3 dimensions.	2017 - 18	III YEAR ARCH A & B
31	B ARCH	ARCHITECTURE	515ART04	Building Services - II	Employability - Educate the importance of building services in attaining a holistic architectural design and achieve proficiency in application of electrical services in design & construction.	2017 - 18	III YEAR ARCH A & B
32	B ARCH	ARCHITECTURE	515ART05	Materials and Construction –V	Employability/ Skill Development - To expose the students to the new emerging materials like special glasses, Aluminum etc and make them aware of advanced techniques and use in the design.	2017 - 18	III YEAR ARCH A & B
33	B ARCH	ARCHITECTURE	515ARP06	Design Studio - V	Employability/ Entrepreneurship/ Skill Development - Understand the process of designing for public, involving multiple activities and thrust shall be on structural grid, development regulations, bye-laws and services.	2017 - 18	III YEAR ARCH A & B
34	B ARCH	ARCHITECTURE	515ARE01	Waste management and recycling	Employability - Encourage the use of by products from the industrial waste as alternative building material and thereby reducing its impact on environment.	2017 - 18	III YEAR ARCH A & B
35	B ARCH	ARCHITECTURE	515ARE02	Structure and Architecture	Employability -Integrate the contemporary structural design in the form making process of architectural design.	2017 - 18	III YEAR ARCH A & B
36	B ARCH	ARCHITECTURE	615ART01	Analysis & Design of Structures - III	Employability - Expose the students to various types of progressive structures and provide knowledge about the factors to be considered while designing such structures.	2017 - 18	III YEAR ARCH A & B
37	B ARCH	ARCHITECTURE	615ART03	Building Services – III	Employability - Gain Knowledge on the specialized seervices and integrate the layout of simple air conditioning system for domestic and office buildings and understanding of intelligent buildings and devices used in them.	2017 - 18	III YEAR ARCH A & B
38	B ARCH	ARCHITECTURE	615ART04	Materials and Construction –VI	Employability/ Skill Development - Comprehend and apply knowledge of advanced construction technologies for large span and complex buildings using paneling, pre-cast and pre-stressed concrete elements etc and vertical connectivity for high rise buildings	2017 - 18	III YEAR ARCH A & B
39	B ARCH	ARCHITECTURE	615ARP05	Design Studio - VI	Employability/ Entrepreneurship/ Skill Development -Focus shall be on the integration of intelligent service systems in to the design of the building and involving the process of designing buildings for multiple layers and innovate the use of materials, intense building services and large span structural systems.	2017 - 18	III YEAR ARCH A & B

40	B ARCH	ARCHITECTURE	615CEO01	Intergrated Surveyig	Employability/ Entrepreneurship/ Skill Development - Develop a sound knowledge of fundamenta principles of surveying and handling various surveying equipments in fields	2017 - 18	III YEAR ARCH A & B
41	B ARCH	ARCHITECTURE	615ARE03	Sustainable Planning and Architecture	Employability - Integrate Sustainable planning and building principles in architectural design.	2017 - 18	III YEAR ARCH A & B
42	B ARCH	ARCHITECTURE	615ARE04	Graphic and Product Design	Employability/ Entrepreneurship/ Skill Development - Understand the principle of a Graphic design and product design and enhance their ideas in design application.	2017 - 18	III YEAR ARCH A & B
43	B ARCH	ARCHITECTURE	711ARP01	Internship Programme - I	Employability/Entrepreneurship/Skill Develoment - Provide adequate knowledge on the practice of architecture profession and to learn the administration, managerial and professional skills, and demostrate the same in the future arhcitectural design study.	2014 - 15	IV YEAR ARCH A & B
44	B ARCH	ARCHITECTURE	811ARP01	Internship Program - II	Employability/Entrepreneurship/Skill Develoment - Provide adequate knowledge on the practice of architecture profession and to learn the administration, managerial and professional skills, and demostrate the same in the future arhcitectural design study.	2014 - 15	IV YEAR ARCH A & B
45	B ARCH	ARCHITECTURE	911ART01	Professional Practice & Ethics	Employability - Introduce aspects of professional conduct, duties and responsibilities and legal rights and procedures of the architectural profession.	2015 - 16	V YEAR ARCH A & B
46	B ARCH	ARCHITECTURE	911ART02	Human Settlements & Planning	Employability - To study the patterns of human settlements and their relevance to architecture through which the betterment of human living and welfare is achieved	2015 - 16	V YEAR ARCH A & B
47	B ARCH	ARCHITECTURE	911ART03	Disaster Mitigation & Management	Employability - Understand the effects of earthquake and response of structures to earthquake and apply the knowledge gained in an architectural design.	2015 - 16	V YEAR ARCH A & B
48	B ARCH	ARCHITECTURE	911ARP04	Architectural Design - VI	Employability/ Entrepreneurship/ Skill Development - Evolving sensitivity to design of spaces at the urban scale – creation of nodes and links, visual landmarks, activity and interaction zones, relationship between commercial, recreational and residential areas.	2015 - 16	V YEAR ARCH A & B
49	B ARCH	ARCHITECTURE	911AET01	Architectural Conservation	Employability/ Skill Development - Understand the values and ethics of conservation and expose students to conservation process and methodology and need for them in Indian context.	2015 - 16	V YEAR ARCH A & B

50	B ARCH	ARCHITECTURE	911AET02	Construction and Project Management	Employability/Skill Develoment - Explore the involment of directing and organizing each part of the project life cycle, from ideation to completion. It's a holistic practice.	2015 - 16	V YEAR ARCH A & B
51	B ARCH	ARCHITECTURE	911AET04	Urban Design & Renewal	Employability - To give awarness to students about the clearing out of blighted areas in inner cities to clear out slums and to know the there is an opportunities for higher class housing, businesses	2015 - 16	V YEAR ARCH A & B
52	B ARCH	ARCHITECTURE	1011ARTH01	Thesis	Employability/ Entrepreneurship/ Skill Development - Demonstrate design project comprehension to independently formulate, analyse, and solve architectural problems.	2015 - 16	V YEAR ARCH A & B
53	B ARCH	ARCHITECTURE	1011ARE01	Urban Housing	Employability - Gain Knowledge on development of housing, its management, and how to make the same user friendly through participatory approach.	2015 - 16	V YEAR ARCH A & B
54	B ARCH	ARCHITECTURE	1011ARE02	Construction planning & Management	Employability/ Entrepreneurship/ Skill Development - Giving insight of buildings/construction projects towards financial management.	2015 - 16	V YEAR ARCH A & B

DEPARTMENT OF ARCHITECTURE * ACE-HOSUR *

SIGNATURE OF CHAIRMAN

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115ART04 **MATERIALS & CONSTRUCTION I** **L T P C**
1 0 4 3

COURSE OBJECTIVES:

- To expose the student to different materials of construction, components and elements of buildings, and to get exposed to various building materials their properties and uses.
- To understand the importance of foundations, plinth, superstructure, and roof of a conventional building by manual drafting and theoretical understanding of soils, mortar as building materials.
- To involve students in a number of drawing exercises that will look at the design and detail of simple structures using naturally occurring materials such as mud, bamboo, straw, etc.
- To understand about the brick bonding and its principles.
- To have theoretical understanding of stone, properties, and use in buildings in various areas and provide drawing exercises that will look at the design and detail of various building components using stone.

UNIT I INTRODUCTION TO BUILDING COMPONENTS **8 Hrs**

Introduction to Functional requirements of building and its components and various building materials, Definition of building, building types (load bearing and framed structures) and building Materials (Soil, stone, brick, clay, rural materials, timber, cement, concrete, iron, steel, aluminum, plastics and glass).

UNIT II SOILS **15 Hrs**

Detailing of walls, roofs, flooring and foundations using soils (rammed earth, compressed blocks). Design exercises using soil for building components in small scale buildings like laborer's house, art centre, snack bar including detailing of arches, walls, door and window openings and understanding of the same through case studies.

UNIT III NATURAL BUILDING MATERIALS / RURAL – MATERIALS & CONSTRUCTION DETAILS **12 Hrs**

Design and Construction Techniques using bamboo for building components for small scale buildings like snack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies.

Design Exercises : using straw bales for building components for Load bearing, Post and Beam systems, Foundations systems, Roofing options, plastering, door and window detailing for small scale buildings and understanding of the same through case studies

UNIT IV BRICKS & CLAY PRODUCTS **20 Hrs**

Basics of brick bonding principles, exercises involving different types of brick bonding. Design and construction of various structural components using bricks in single or (Ground+1) buildings – small house, community hall, snack bar etc. and understanding the same through case studies including methods of construction of various non-structural building components such as partition walls, screens, compound walls, parapets, coping - understanding the same through exercises and case studies.

Design exercises using clay blocks for flooring, roofing and walling in single or (Ground+1) buildings including detailing of Mangalore tiles, pot tiles, pan tiles roofing -understanding the same through exercises and case studies.

UNIT V STONE **20 Hrs**

Design Exercises – Using stone (Ashlar, rubble etc.,) for building components including detailing of

arches, corbels, coping, sills, lintels, corbels, arches, cladding in small scale buildings like classrooms, library and community hall and understanding the same through case studies

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO 1: Identify the basic building components of a building such as brick, mortar, masonry construction, lintels and arches and their construction methods.

CO 2: Identifying the particular materials for usage of load bearing building of different soil types.

CO 3: Use appropriate rural building materials based on the properties, behavior and applications.

CO 4: Experienced various techniques of bricks and types of bonding.

CO 5: The students learned the application of stones by construction drawings.

TEXT BOOKS:

1. Varghese P.C., "Building Materials", Prentice Hall of India put Ltd New Delhi, 2005.
2. Dunkelberg (K), "Bambus – Bamboo, Bamboo as a Building Material", Karl Kramer Verlag Stuttgart, 2000.
3. Gernot Minke and Friedemann Mahlke "Building with straw: Design and Technology of a Sustainable Architecture", Birkhauser,Publisher for Architecture Berlin, Bostan, 2005.
4. Barry, "Construction of Buildings", Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005

REFERENCES:

1. Don A. Watson, "Construction Materials and Processes", McGraw Hill, 1972. W.B. McKay, "Building Construction", Vol, 1 and 2, Longmans, UK, 1981.
2. S.C Rangwala "Building Construction", Charotar Publishing House, India, 2000
3. S.K.Sharma, "A Text book of Building Construction", S.Chand & Co Ltd., New Delhi, 1998
4. Francis D.K Ching "Building Construction" illustrated, John Willey & Sons, 2008.
5. Wills H Wagner, Howard Bud, " Modern Carpentry", Good Heart – Wilcox publishers, Portland, 2003
6. Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi, 2012
7. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Identify the basic building components of a building such as brick, mortar, masonry construction, lintels and arches and their construction methods.	3	2	3	-	1	-	-	-	-	-	2
CO2	Identifying the particular materials for usage of load bearing building of different soil types.	3	2	3	-	1	-	-	-	-	-	2
CO3	Use appropriate rural building materials based on the properties, behavior and applications.	3	2	3	-	1	-	-	-	-	-	2
CO4	Experienced various techniques of bricks and types of bonding.	3	2	3	-	1	-	-	-	-	-	2
CO5	The students learned the application of stones by construction drawings.	3	2	3	-	1	-	-	-	-	-	2

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115ART05 **ARCHITECTURAL GRAPHICS – I** **L T P C**
1 0 4 3

COURSE OBJECTIVES:

- To introduce the concepts and fundamentals of architectural drawing, to develop representation skills.
- To nurture the understanding of the nature of geometrical forms and simple building forms
- To teach the language of architectural and building representation in two- and three dimensions.
- To enable the students to understand the axonometric projections of solids with various exercise.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advance techniques of representation.

UNIT I ARCHITECTURAL GRAPHICS FUNDAMENTALS **15 Hrs**

Introduction to fundamentals of drawing/ drafting: Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, etc.; Construction of angles, use of scales; Construction of circles, tangents, curves and conic sections.

UNIT II GEOMETRICAL DRAWING: PLANE GEOMETRY **20 Hrs**

Construction and development of planar surface – square, rectangle, polygon etc Introduction of multi- view projection – projection of points, lines and planes.

UNIT III GEOMETRICAL DRAWING: SOLID GEOMETRY **10 Hrs**

Multi- view projection of solids – cube, prism, pyramids, cones, cylinders etc.; Sections of solids, true shape of solids.

UNIT IV GEOMETRICAL DRAWING: AXONOMETRIC PROJECTION & ORTHOGRAPHIC PROJECTIONS **10 Hrs**

Isometric, plan oblique and elevation oblique projection of planes, solids and combination of solid etc.

UNIT V MEASURED DRAWING **20 Hrs**

Introduction to fundamentals of measured drawing, line value, lettering, drawing representation, format for presentation methods and technique of measuring buildings and their details. Measured drawing of simple objects like furniture, detailing in terms of construction, ornamentation, measured drawing of building components like column, door, window, cornice, etc.

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO 1: An understanding on the concepts of architectural drawing as well as representation skills are imparted.
CO 2: Experienced how lines creates projections of planar geometry with various exercise.
CO 3: Gained knowledge on representation in 2D with multi view projections.
CO 4: Understanding on 3D orthographic projections and its model with various task.
CO 5: Worked on preparation of measured drawing and its application.

TEXT BOOKS:

1. Morris IH., "Geometrical Drawing for Art Students", Orient Longman, Madras, 2004.

2. Francis D. K. Ching, "Architectural Graphics", John Wiley and Sons, 2009.
3. Fraser Reekie, Reekie's, "Architectural Drawing", Edward Arnold, 1995

REFERENCES:

1. Leslie Martin C., "Architectural Graphics", The Macmillan Company, New York, 1978.
2. CooperFlouglas, Drawing & Perceiving, Van Nostrand Rein hold, New York 1995.
3. Hale Robert Beverly Watson Drawing lessons from the Great Masters,Guptill publication New York 1964
4. Bhatt N.D, Engineering drawing, Charotar publishing house, Anand, India, 1990.
5. Edward J Muller, James G Fausett, Philip A Grau, Architectural Drawing & Light Construction – Preutice-Hall Inc.,-1993

Course Outcome		Program Outcome								Program Specific Outcom		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	An understanding on the concept of architectural drawing as well a representation skills are imparte	-	2	-	-	3	-	-	-	-	-	2
CO2	Experienced how lines creat projections of planar geomet with various exercise.	-	2	-	-	3	-	-	-	-	-	2
CO3	Gained knowledge on representation in 2D with multi view projections.	-	2	-	-	3	-	-	-	-	-	2
CO4	Understanding on 3D orthograph projections and its model wi various task.	-	2	-	-	3	-	-	-	-	-	2
CO5	Worked on preparation measured drawing and application.	-	2	-	-	3	-	-	-	-	-	2

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115ARP06 **ART STUDIO** **L T P C**

1 0 4 3

COURSE OBJECTIVES:

- To familiarize the student with the various mediums and techniques of art though which artistic expression can be achieved.
- To understand free hand drawing as a means to communicate and to train the students to sketch and render natural forms, built forms and presentation drawings manually in various media.
- To familiarize student with the grammar of art by involving them in a series of free hand exercises both indoor and outdoor to understand form, proportion, scale, etc.
- Involving them in a series of exercises which will help them experiment with form and volume.
- To involve students in a series of exercises this will look at graphic an abstract representations of art.

UNIT I INTRODUCTION TO DRAWING **18 Hrs**

Introduction to art – Principles and Elements of drawing- LINE, SHAPE, FORM,SPACE,COLOR,TEXTURE– CUBE, CONE, Pyramid, CIRCLE, Cylinder – Types of Drawing – Visual Effects of Drawing– Scale Drawing– Composition- Study of light, shade and shadow – Solids– pencil Rendering- Model Making –Study of 3 D effects through light and shade from nature – Tools and materials.

UNIT II FREE-HAND DRAWING **15 Hrs**

Sketching -Geometrical shapes & Still life-furniture, objects, equipment's .Understanding depth, light & Shade, Sciography etc., Object Drawing, Still Life, Nature Study– Pencil Rendering.

UNIT III PAINTING **15 Hrs**

Introduction of painting – Colour – Properties of colour – Colour schemes – Types of colours Application and visual effects of colour. Exercise involving Study of colour – Properties of paper, brush and other tools – Basic washes – 3D effects from still-life, nature and built environment using mono chromatic and multi colour.

UNIT IV RENDERING **15 Hrs**

Artistic skill development through–Exploring Color theory, Texture as their application –Study of Linear Forms & Planer Forms –Study of Paper Forms, Fluid / Plastic Forms through the method of model making –Pattern Making and its application–Application of the introduced concepts in Two Dimension as well as in Three Dimensions drawings.

UNIT V ANATOMY SKETCHING **12 Hrs**

Introduction of human anatomy, Sketching human forms [Knowledge of anatomy] – Free hand Drawing, gesture Drawing, Rendering with Various Methods and Mediums.

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO 1: The students are exposed to various mediums and techniques.
CO 2: Sensitized to culture, craft and context.
CO 3: Bold enough to handle to the colors for the presentation sheets.
CO 4: The students are mastery in sketching and expression through forms.

CO 5: The skill and knowledge gained with the human sketches are useful for anthropometry study.

TEXT BOOKS:

1. Webb, Frank, "The Artist guide to Composition", David & Charles, U.K., 1994.
2. Ching Francis, "Drawing a Creative Process", Van Nostrand Reinhold, New York, 1990.
3. Alan Swann, "Graphic Design School", Harper Collins, 1991.
4. Moivahuntly, "The artist drawing book", David & Charles, U.K., 1994.

REFERENCE BOOKS:

1. 'Principles of three Dimensional Design' by Wucius Wong-Published by Van Nostrand. New York 1972
2. Francis D K Ching, Drawing a Creative Process, Van Nostrand, Reinhold New York 1990.
3. "Form, Space and Order" by Francis D K Ching.
4. "Art of color and Design" by Maitland Graeves
5. Rendering with Pen and Ink by Gill
6. The art of drawing trees, heads, colours, mixing,. Drawing Landscape & painting, water colour painting, oil painting etc. The Grumbacher Library Books, New York 1966.

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	The students are exposed to various mediums and techniques	-	2	-	-	3	-	-	-	2	-	-
CO2	Sensitized to culture, craft and context.	-	2	-	-	3	-	-	-	2	-	-
CO3	Bold enough to handle to the colors for the presentation sheets	-	2	-	-	3	-	-	-	2	-	-
CO4	The students are mastery in sketching and expression through forms	-	2	-	-	3	-	-	-	2	-	-
CO5	The skill and knowledge gained with the human sketches are useful for anthropometry study.	-	2	-	-	3	-	-	-	2	-	-

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115ARP07 **DESIGN STUDIO I**

L T P C
0 0 10 5

COURSE OBJECTIVES:

- To theoretically understand first the various elements of basic design relationship, and principles and demonstrate the same through drawing exercises.
- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises that will develop the originality, expression, skill and creative thinking.
- To involve students in a number of exercises to understand the grammar of design and visual composition.
- To enable the understanding of 3 D Composition by involving students in a number of exercises which will help generation of a form from a two dimensional / abstract idea and understand of the relationship between the grammar of design and architecture by involving the students in seminars / workshops and simple exercises which will look at building form analytically.

UNIT I Introduction to Architectural Design through Basic Design – Elements of Design **30 Hrs**

The design exercises shall be aimed at understanding the role of basic elements of design – Point, Line, Plane and Volume, Patterns, Shapes, Forms, Spaces, Color, Texture, Levels, Light, Fenestrations, Application of modules.

UNIT II Principles of Visual Compositions **50 Hrs**

Understanding and using principles like Movement, Direction, Gradation, Contrast, Repetition, Rhythm, Radiation, Symmetry, Asymmetry, Monotony, Harmony, Balance, Scale and Proportion, Form generation through addition & subtraction, Positive & Negative spaces, Solid and Voids.

UNIT III Figure & Ground relationships **50 Hrs**

Architectural elements and their part played in modulating space- Horizontal and Vertical space defining elements (linear or planar) and openings in them.

UNIT IV Articulation of Forms and Spatial Relationships **50 Hrs**

The design exercises shall be aimed at understanding: Articulation and its role as a form modifier – edges and corners, surfaces - Spatial relationships - Space within a space, interlocking spaces, adjacent spaces and spaces linked by a common space.

- Study of Spaces responding to human anthropometrics.
- Simple space organization starting with single activity to multifunctional spaces.
- To understand the workshop tools and equipment's useful for model making and practically experiment with creative design ideas.
- Real life situations as a context to generate the concept of abstract thinking in beginners.

The course shall be conducted by giving a number of exercises in the form of design studios, Seminars and creative workshops that are aimed at teaching the following:

i) Elements and Principles of Visual Composition using point, line, shape.

ii) Exploring colour schemes and their application in a visual composition and in Architectural forms and spaces.

iii) Study of texture and schemes of texture both applied and stimulated and their application.

iv) Study of linear and planar forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol etc.

v) Study of Solids and voids to evolve sculptural forms and spaces and explore the play of light and shade and application of color.
vi) Study of fluid and plastic forms using easily moldable materials like clay, plaster of paris etc.
vii) Analytical appraisal of building form in terms of visual character, play of light and shade, solids and voids etc.
viii) Application of Basic design in Architectural Design through the manipulation of line, plane, solid and voids and application of texture colour, proportion etc.

TOTAL: 180 Hrs

COURSE OUTCOMES:

CO 1: An understanding of the qualities of different elements as well as their composite fusions.
CO 2: An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects.
CO 3: To introduce the meaning of "design" and relate it to "architecture" through an understanding of basic elements of design, the principles of design relationships and analysis of design elements.
CO 4: Students are trained to develop abstract and real compositions in drawings. Simultaneously workshop exercises involving real and abstract models made of match sticks, Card boards, wires, wood pieces to familiarize students with such skills shall be given importance.

TEXT BOOKS:

1. Owen Cappleman& Michael Jack Jordon, Foundations in Architecture : An Amotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993.
2. Charles Wallschlacgerm& Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, Mc Graw Hill, New York 1992.

REFERENCES:

1. Pramar V.S., Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
2. Francis D.K.Ching, "Architecture: Form, Space and Order, Van Nostrand Reinhold Co., (Canaa), 1979.
3. Elda Fezei, Henny Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
4. Lawrence Bunchy C.Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y.10001, 1972.
5. Exner V., Pressel D., "Basics Spatial Design", Birkhanser, 2009.

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	An understanding of the qualities of different elements as well as their composite fusions.	3	3	-	-	3	-	-	-	3	2	2
CO2	An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects.	3	3	-	-	3	-	-	-	3	2	2
CO3	To introduce the meaning of "design" and relate it to "architecture" through an understanding of basic elements of design, the principles of design relationships and analysis of	3	3	-	-	3	-	-	-	3	2	2

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	design elements.											
CO4	Students are trained to develop abstract and real compositions in drawings. Simultaneously workshop exercises involving real and abstract models made of match sticks, Card boards, wires, wood pieces to familiarize students with such skills shall be given importance.	3	3	-	-	3	-	-	-	3	2	2

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115AET01 **PERSONALITY DEVELOPMENT** **L T P C**
2 0 0 2

COURSE OBJECTIVE:

- To build confidence and guide thought process.
- To help the students achieve effectiveness in their professional activities, harness skills and develop qualities suited for the profession.
- To groom students' attitude and develop communication skill.
- To build the communication skills in the field projects.
- To provide knowledge in time management and projects stages.

UNIT I **Personality** **7 Hrs**

Nature of personality. Theories of personality- Type, Trait, Social Learning. Determinants of personality, Personality traits.

UNIT II **Attitude Building** **9 Hrs**

Importance of attitude, factors that determine our attitude, types of attitude, building positive attitude, developing optimism and discipline.

UNIT III **Group and Team Work** **9 Hrs**

Group and Team dynamics, Group Structuring- Leadership, role, Tasks, effective team work. Exercises to understand the nature of a team, team building, members and achieving a given task. Purpose (Intellectual ability, creativity, approach to a problem, solving, tolerance, qualities of a leader). Group behavior, analyzing performance

UNIT IV **Communication Skills** **9 Hrs**

Verbal communication, Body language, Vocabulary building, Public speaking and extempore speech skills, Presentation skills, Panel discussions. Written communication- Letters, reports etc. Conflict Management, Assertiveness, Time management.

UNIT V **Time & Stress Management** **5 Hrs**

Types of time, Identifying time wasters, Time management skills. Importance, Causes, Stress relief mechanisms

TOTAL: 45 Hrs

TEXT BOOKS:

1. Developing Communication Skills, Krishna Mohan & Meera Banerji Macmillan India
2. Principles of Public Relations, C S Rayudu, Himalaya Publishing House
3. Organizational Behavior, K. Ashwathappa, Himalaya Publishing House
4. Emotional Intelligence, Daniel Colman

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Attained Confidence and improved thought process.	-	-	3	-	-	-	2	-	3	2	2
CO2	Understood the behavioral aspects and built attitude.	1	-	2	-	-	-	1	-	3	2	2

CO3	Exposed to a team work to implement in project management.	3	1	2	2	-	-	2	-	3	2	2
CO4	Students are trained in communication skills	-	-	2	-	-	-	-	-	3	2	2
CO5	Gained knowledge in time management.	2	1	2	2	-	-	2	-	3	2	2

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115AET02 **ART APPRECIATION** **L T P C**
2 0 0 2

COURSE OBJECTIVES:

- To introduce the vocabulary of art and the principles.
- To inform students about the various art forms through the ages within the cultural contexts.
- To study Modern Art and the new directions that evolved in the 19th and 20th centuries.
- To inform the production of art in the Indian context through history and the contemporary manifestations.
- To enable students to understand role of art in India through ages.

UNIT I INTRODUCTION TO ART **6 Hrs**

Definition of art - need for art – role of art – art reality, perception, representation- categories of art in terms of media and technique - appreciating art: form, content and context

UNIT II VOCABULARY OF ART **8 Hrs**

Introducing the vocabulary of art constituted by elements (line, shape, form, space, colour, light, value, texture) and principles (unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement)

UNIT III APPRECIATING ART – BEGINNINGS TO MODERN ART **12 Hrs**

Appreciating art through the study of art production in the West from the beginnings to the birth of modern art. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Prehistoric Art - Egyptian and Mesopotamian art Greek and Roman art– Medieval art - Renaissance and Baroque art - Neoclassicism - Romanticism – Realism

UNIT IV APPRECIATING ART- MODERN ART AND AFTER **10 Hrs**

Appreciating art through the study of art production in the West over history from modern art till the present. Important works from the following art traditions will be studied and analysed in terms of their form, content and context : Context for new directions in art in the late 19th and early 20th century - Impressionism – post Impressionism – Fauvism- Expressionism- Cubism – Dadaism – Surrealism - abstract art – Futurism - Constructivism – Suprematism – De Stijl - Abstract Expressionism - Pop art –forms and media of art.

UNIT V APPRECIATING ART- INDIAN ART **9 Hrs**

Appreciating art through the study of art production in India over history. Important works from the following art traditions will be studied and analysed in terms of their form, content and context Indus Valley Art - Hindu Buddhist and Jain art - Mughal and Rajput miniatures - art during the colonial period - modern Indian Art.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: Ability to understand and appreciate art as a fundamental human expression.
CO 2: Awareness of important art productions in the West and India.
CO 3: Sensitivity towards individual and collective human cultural productions as unique expressions of historical and geographic context.
CO 4: Ability to understand art through ages with different approaches.
CO 5: Understood the traditional context, art forms through various works.

TEXT BOOKS:

1. Fred, S. Kleiner, "Gardener's Art through Ages", Harcourt College Publishers, 2001

2. Bernard S. Myers, Understanding the Arts, Holt, Rinehart and Winston Inc, 1964
3. Edith Thomory, "A History of Fine Arts in India and the West", Orient Longman Publisher's Pvt. Ltd, 1982
4. H.H. Arnason, "History of Modern Art", Thames and Hudson, 1977.

REFERENCES:

1. Peter and Linda Murray, "The Penguin Dictionary of Art and Artists", Penguin books 1989.
2. E.H. Gombrich, "The Story of Art", Phaidon, 2002
3. E.H.Gombrich, "Art and Illsuion", Phaidon, 2002
4. Artists Handicrafts Association, "Indian Art since the early 1940s- a search for Identity",1974
5. A.K.Coomaraswamy, "Fundamentals of Indian Art", Historical Research Documentation Programme, Jaipur, 1985

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Ability to understand and appreciate art as a fundamental human expression	2	2	3	-	-	-	-	-	3	2	-
CO2	Awareness of important art productions in the West and India	1	1	3	-	-	-	-	2	3	2	-
CO3	Sensitivity towards individual and collective human cultural productions as unique expressions of historical and geographic context.	1	2	2	-	-	-	-	3	3	2	-
CO4	Ability to understand art through ages with different approaches	-	-	1	1	-	-	-	2	3	2	-
CO5	Understood the traditional context, art forms through variousworks.	2	-	2	-	1	-	-	2	3	2	-

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215ART01 **MECHANICS OF STRUCTURES- I** **L T P C**
2 1 0 3

COURSE OBJECTIVES:

- To enable a student to understand the effect of action of forces on a body and the concept of equilibrium of the body through exercises.
- To determine the internal forces induced in truss members due to external loads by working out problems.
- To calculate the structural properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems.
- To study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through select problems.
- To drive the relationship between elastic constants and solving problems.

UNIT I FORCES AND STRUCTURAL SYSTEMS **12 Hrs**

Types of force systems - Resultant of forces- lami's theorem- principle of moments - varginon's theorem - principle of equilibrium (no reaction problems) - simple problems

UNIT II ANALYSIS OF PLANE TRUSSES **10 Hrs**

Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints.

UNIT III PROPERTIES OF SECTION **8 Hrs**

Centroid- Moment of Inertia - Section modules – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis –simple problems.

UNIT IV ELASTIC PROPERTIES OF SOLIDS **8 Hrs**

Definition for stress, strain and its types – young's Modulus, Poisson's Ratio - Stress strain diagram for mild steel – Compound bars.

UNIT V ELASTIC CONSTANTS **7 Hrs**

Elastic constants - Relation between elastic constants - Application to problems.

TOTAL: 45 Hrs

COURSE OUTCOMES:

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

CO 1: Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.

CO 2: Analyze any type of determinate trusses with different end conditions.

CO 3: To solve the sectional properties for any geometrical shapes.

CO 4: The concepts of elastic constants and its applications for various types of problems with a thorough understanding of stresses and strain.

CO 5: To Understand the relationship between elastic constants and solving problems.

TEXT BOOKS:

1. Bansal R.K.– A text book on Engineering Mechanics, Laxmi Publications, Delhi, 2005.
2. Bansal R.K. – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

REFERENCES:

1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Nash W.A., "Strength of Materials" – Schaums Series, McGraw Hill Book Company, 1989.
4. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.
5. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.

Course Outcome		Program Outcome												Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.	3	2	3	-	-	-	-	1	-	-	-	-	1	1	-
CO2	Analyze any type of determinate trusses with different end conditions.	1	1	1	-	-	-	-	-	-	-	-	-	1	1	1
CO3	To solve the sectional properties for any geometrical shapes.	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1
CO4	The concepts of elastic constants and its applications for various types of problems. Thorough understanding of stresses and strain.	1	-	-	-	-	-	1	-	-	-	-	-	1	-	1
CO5	To Understand the relationship between elastic constants and solving problems	2	2	2	1	2	1	-	-	-	-	-	-	1	2	-

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215ART01 **MECHANICS OF STRUCTURES- I** **L T P C**
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COURSE OBJECTIVES:

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- To determine the internal forces induced in truss members due to external loads by working out problems.
- To calculate the structural properties (centroid, moment of inertia, section modulus and radius of gyration) for various sections by working out problems.
- To study the stress – strain behaviors of steel and concrete due to axial loads and to determine the stresses and strains developed in solids due to external action through select problems.
- To drive the relationship between elastic constants and solving problems.

UNIT I FORCES AND STRUCTURAL SYSTEMS **12 Hrs**

Types of force systems - Resultant of forces- lami's theorem- principle of moments - varginon's theorem - principle of equilibrium (no reaction problems) - simple problems

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UNIT V ELASTIC CONSTANTS **7 Hrs**

Elastic constants - Relation between elastic constants - Application to problems.

TOTAL: 45 Hrs

COURSE OUTCOMES:

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

CO 1: Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.

CO 2: Analyze any type of determinate trusses with different end conditions.

CO 3: To solve the sectional properties for any geometrical shapes.

CO 4: The concepts of elastic constants and its applications for various types of problems with a thorough understanding of stresses and strain.

CO 5: To Understand the relationship between elastic constants and solving problems.

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2. Bansal R.K. – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

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1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Nash W.A., "Strength of Materials" – Schaums Series, McGraw Hill Book Company, 1989.
4. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.
5. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.

Course Outcome		Program Outcome												Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.	3	2	3	-	-	-	-	1	-	-	-	-	1	1	-
CO2	Analyze any type of determinate trusses with different end conditions.	1	1	1	-	-	-	-	-	-	-	-	-	1	1	1
CO3	To solve the sectional properties for any geometrical shapes.	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1
CO4	The concepts of elastic constants and its applications for various types of problems. Thorough understanding of stresses and strain.	1	-	-	-	-	-	1	-	-	-	-	-	1	-	1
CO5	To Understand the relationship between elastic constants and solving problems	2	2	2	1	2	1	-	-	-	-	-	-	1	2	-

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215ART04 **MATERIALS & CONSTRUCTION II** **L T P C**
1 0 4 3

COURSE OBJECTIVES:

- To introduce the students to various assembly systems of timber and plywood, its defects and preservation process in architectural applications.
- To enable a student draw joinery details, the various use in building industry, its structural application, and furniture through select exercises.
- To understand cost efficient techniques of construction using different materials by drawing exercises.
- The course will enable the learning in progression, starting from simple building elements, components, materials and construction techniques to develop strong sense of visualization.
- The students have to learn the applications and various components through scaled drawings.

UNIT I TIMBER IN CONSTRUCTION **15 Hrs**

Timbers -Methods of construction using natural timber in joinery works including methods of fixing and options for finishing - Softwood and hardwood - Secondary timber - Physical properties and uses - Defects, Conversion, Seasoning, decay and preservation of timber - Fire retardant treatment, anti-termite treatment. Industrial timbers - plywood, blackboard, particle board, fiber boards. Manufacture and uses - current developments.

UNIT II TIMBER JOINERIES **18 Hrs**

Different types and methods of fixing - Windows (panelled, louvered, glazed, pivoted and sliding windows) - Doors (panelled, glazed, sliding, folding, louvered and pivoted) - Ventilators (top hung, louvered, and glazed) - Hardware for doors, windows and ventilators and application for a simple structure with schedule of joinery.

UNIT III TIMBER DOORS AND WINDOWS **15 Hrs**

Drawings of timber joinery for windows, doors, ventilators. Types of timber doors such as ledged, braced and battened, panel, glazed, flush doors. Types of windows such as Fixed, side and top hung, pivoted, louvered, ventilators and fanlights.

UNIT IV PARTITIONS AND STAIRCASE **12 Hrs**

Timber partitions, paneling, wall paneling. Timber staircases – Designed staircase

UNIT V COST EFFECTIVE BUILDING TECHNOLOGY **12 Hrs**

Drawings of foundations – walling – Roofs – partitions – ceiling panel – doors and windows. Drawings of Brick jalis, Screen walls – pavement blocks – Ferro cement water tanks.

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO 1: An Understanding of timber products and methods of construction and detailing.
CO 2: Gained knowledge on different timber joinery details.
CO 3: Worked on Sheets showing the fixing details of timber doors and windows.
CO 4: Exposure given to various details of partitions and staircase.
CO 5: An Understanding of cost effective building technologies.

TEXT BOOK

1. Don A. Watson, "Construction Materials and Processes", McGraw Hill, 1972.

2. W.B. McKay, "Building Construction", Vol, 1 and 2, Longmans, UK, 1981.
3. S.C Rangwala "Building Construction", Charotar Publishing House, India, 2000
4. S.K.Sharma, "A Text book of Building Construction", S.Chand & Co Ltd., New Delhi, 1998

REFERENCES:

1. S.C.Rangwala, Engineering Materials, CharotarPub.House, Anand, 1997.
2. W.B.Mckay, 'Building Construction', Vol.1, 2, 3 Longmans, U.K. 1981.
3. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
4. Alanwerth, Materials, The Mitchell Pub. Co. Ltd., London, 1986.
5. R.Chudleu, 'Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	An Understanding of timber products and methods of construction and detailing.	3	3	3	3	3	3	1	3	3	3	1
CO2	Gained knowledge on different timber joinery details.	3	3	2	2	1	2	1	2	-	-	1
CO3	Worked on Sheets showing the fixing details of timber doors and windows.	3	3	2	2	1	2	1	2	-	-	1
CO4	Exposure given to various details of partitions and staircase.	3	3	3	3	3	3	1	3	3	3	1
CO5	An Understanding of cost effective building technologies.	3	3	2	2	1	2	1	2	-	-	1

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215ART05 **ARCHITECTURAL GRAPHICS – II** **L T P C**
1 0 3 3

COURSE OBJECTIVES:

- To involve students in a number of exercises that will help them develop the skill of representation in advance drawing techniques involving perspective and sciography.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advanced techniques of representation.
- To develop the skill of representation in advanced drawing techniques and building documentation.
- To explore the student about the sciography for various building

UNIT I PLANS & SECTIONS OF BUILDINGS **10Hrs**

Introduction to the basic principles of drawing - scale conversion etc. Graphical representation of plans and sections of buildings. Floor plans, elements above and below plan cut, reflected ceiling plan, site plan with contours, site sections, building elevations, section of buildings.

UNIT II MEASURED DRAWING **12 Hrs**

Combined study of historic document along with small building.s by using simple measuring tools like tapes, photograph etc.

UNIT III PERSPECTIVE: SCIENTIFIC METHOD **12 Hrs**

Concepts and methods of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes, simple one, two and three-point perspective of building interiors and exteriors. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

UNIT IV PERSPECTIVE: SHORT OUT METHOD **12 Hrs**

Introduction to short cut perspective method. Adding of figures, trees furniture etc., shade and shadows and applying rendering techniques.

UNIT V SCIOGRAPHY **14 Hrs**

Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.

TOTAL: 60 Hrs

COURSE OUTCOMES:

CO 1: The techniques and skills gained learned through this subject Architectural drawing II is very useful to their profession

CO 2: Able to construct the perspective drawings of the buildings and 3d views as well the Documentation of buildings through drawings.

CO 3: Got exposed to the perspective method.

CO 4: Gained Knowledge on the principle of shade and shadows.

TEXT BOOK:

1. John M.Holmes, Applied Perspective, Sir Isaac, Piotman and Sons Ltd., London 1954.
2. Robert W.Gill, Basic Perspective, Thames and Hudson, London, 1974.
3. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964.

4. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975

REFERENCES:

1. Claude Batley, Indian Architecture, D.B.Taraporevale Sons and Co., Ltd., Bombay
2. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
3. George A Dinsmore, Analytical Graphics – D.VanNostrand, Company Inc., Canada.
4. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd., Japan, 1967.
5. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.
6. Bernard Alkins- 147, Architectural Rendering, Walter Foster Art Books, 1986.
7. RoberW.Gill, Advanced Perspective, Thames and Hudson, London, 1974

Course Outcome		Program Outcome								Program Specific Outcome		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	The techniques and skills gained learned through this subject Architectural drawing II is very useful to their profession	3	3	2	3	-	-	-	-	3	-	3
CO2	Able to construct the perspective drawings of the buildings and 3d views as well the Documentation of buildings through drawings.	3	3	2	3	-	-	-	-	3	-	3
CO3	Got exposed to the Perspective method.	3	3	2	3	-	-	-	-	3	-	3
CO4	Gained Knowledge on the principle of shade and shadows.	3	2	3	1	-	-	-	-	3	-	2

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215ARP06 **COMPUTER STUDIO I** **L T P C**
0 0 6 3

COURSE OBJECTIVES:

- To inform the student, basic understanding of components, operation system, (WINDOWS) application software and other accessories.
- To make a student understand basic tools in computer aided design i.e. formatting (limits, units, etc) drawing tools or drafting, modification of the same and knowledge on understanding of advanced tools such as layers, line type, etc. 2D drafting of building drawings.

Introduction to Computer - Technology of small computer system, computer terminology, operation principles of P.C., introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc.
Computer Aided 2D drafting - Understanding the use of drawing tools, object editing, drawing objects, filing and setting drawing units, scales, limits that size and dimensioning, texting.
Setting up of drawings of various simple architectural objects with complete text and dimensioning.
Advance command programming - transparent overlays hatching utilities, assigned colour and line type, use of multiline, style, block, symbol Library manipulation for accurate drawing.
Advance exercise in 2D drafting of various complex building drawings, incorporating the above said utilities.

TOTAL: 90 Hrs

COURSE OUTCOMES:

CO 1: The students benefit by learning software which helps them to explore 2D drafting and detailing of buildings.
CO 2: Exposure given on drawings objects, fitting, setting, size and dimensioning, with a thrust on advanced 2D drafting techniques involving complex building drawings.

TEXT BOOKS:

1. A. Watt, "Fundamentals of Three-Dimensional Computer Graphics", Addison Wesley,
2. Massachusetts, 1989.
3. 2.Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon
4. process, 2012

REFERENCES:

1. Sham Tickoo, Advance Technique in AutoCAD Re.14 - 1997.
2. V.Rajaraman, Principles of Computer Programming - Prentice Hall of India.
3. Byron S.Gottfried, Theory and problems of programming with C.Schaum's outline series, McGraw-Hill Publishing Co.
4. AutoCAD reference manual - Autodesk UNC, 1998.
5. AutoCAD architectural users guide - Autodesk Inc., 1998.
6. Sham Tickko, Understanding AutoCAD - 14 (Windows) - 1997.
7. Computer Graphics – Numan & Sprool.

Course Outcome		Program Outcome												Program Specific Outcome		
CO'S		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	The students benefit by learning software which	3	3	3	2	2	1	1	2	1	-	-	-	-	-	1

	helps them to explore 2D drafting and detailing of buildings.															
CO2	Exposure given on drawings objects, fitting, setting, size and dimensioning, with a thrust on advanced 2D Drafting techniques involving complex building drawings	1	-	3	-	-	-	-	-	2	-	-	-	-	-	1

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215ARP07	DESIGN STUDIO II	L T P C 0 0 12 5

COURSE OBJECTIVES:

- To involve students in a design project(s) that will involve simple space planning and the Understanding of the functional aspects of good design.
- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts and architectural program.
- To enable a student understand the basics of anthropometrics, its application in articulating vertical, horizontal space and later on in simple buildings including considerations for physically challenged through a design process resulting in specific typologies, as specified.

DESIGN STUDIO

Basic anthropometrics, human functions and their implications for space requirements. Minimum and optimum areas for mono functions, User's data, Movement and circulation diagrams, spatial interpretations – various activities and their relationship with spaces. Anthropometry as related to physically handicapped and elderly persons are required to be studied. Functional furniture layout, circulation, lighting and ventilation for spaces. Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale.

Examples of exercises include

a) Toilet for a physically handicapped person. Hostel room, bed room, kitchen, living/dining,

b) Shop, Workshop, pavilions, snack bar

c) Residence, petrol bunk, fire station, police station, cottage for an elderly couple

d) Architect's office, Doctor's clinic etc.,

e) Design of simple building elements such as Entrance portal, Garden pavilion, Memorial, edifice, Bus shelter, snack kiosk and layout of parks.

TOTAL: 180 Hrs

COURSE OUTCOMES:

CO 1: The characteristics of site, importance of site planning and built form/open space relationship has been understood. User group responses were ascertained through case-studies.

CO 2: Presentation of concepts was enabled through 2D drawings, sketches of model.

CO 3: To develop the ability to translate abstract principles of design into architectural solutions for simple problems.

CO 4: To provide basic understanding of the functional aspect in designing simple building type and its relevant spatial organization

TEXT BOOKS:

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 Neuferts, "Architects Data," Blackwell, 2002.
5. Ramsey et al, "Architectural Graphic Standards", Wiley, 2000.

REFERENCES:

1. Richard P. Dober, "Campus Planning" - Society for College and University Planning, 1996.
2. Achyut Kanvinde, "Campus design in India", American year Book, 1969
4. Kevin Lynch, "Site planning", MIT Press, Cambridge, 1967
5. Sam F. Miller, "Design Process: A Primer for Architectural and Interior Design", Van Nostrand Reinhold, 1995.

Course Outcome		Program Outcome								Program Specific Outcome		
CO'S		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	The characteristics of site, importance of site planning and built form/open space relationship has been understood.	3	3	3	2	2	1	1	2	3	2	3
CO2	User group responses were ascertained through case-studies.	3	3	3	2	2	1	1	2	3	2	3
CO3	Presentation of concepts was enabled through 2D drawings, sketches ofmodel.	3	3	3	3	2	3	1	-	3	3	3
CO4	To develop the ability to translate abstract principles of design into architectural solutions for simple problems.	3	3	3	3	2	3	1	-	3	3	3

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215ARE04 **COMMUNICATION SKILLS** **L T P C**
2 0 0 2

COURSE OBJECTIVES:

- To facilitate students, amplify suitable language skills (LSRW) for academic and professional purposes
- To inculcate and develop strategies to understand and to increase students' efficiency in their academic and general reading
- To strengthen students' vocabulary power
- To familiarize students with different functions of technical and scientific English
- To coach the students in augmenting the technical writing skills like writing letters and reports in formal and business situations.

UNIT I COMMUNICATION **9 Hrs**

Importance – Types of Communication – Elements of Good Individual Communication - Barriers to Communication.

UNIT II LISTENING **9 Hrs**

Importance – Types of Listening – Barriers to Listening – Listening Comprehension – Note-taking – Ink Talks and Longer Talks – Listening to Formal and Informal Conversation – Talks on Science and Technology.

UNIT III SPEAKING **9 Hrs**

Presentation Skills - Understanding the differences among Seminars, Conferences, Convention, Congress – Debate – Extempore – Panel Discussion – Group Discussion – Description of Place – Conversation and Answering Questions – Talking about ones Project Proposal – Telephone Etiquette.

UNIT IV READING **9 Hrs**

Importance – Techniques of Reading – Texts on Architecture – Architecture Manuals – Essays on Construction, Buildings, Different Schools of Architecture – Case Study – Technical and Scientific Articles.

UNIT V WRITING **9 Hrs**

Vocabulary Building – Paragraph Writing – Process Description – Synopsis Writing – Report Writing – Resume Writing - Essay Writing – Letter Writing: Fellow Architects, Clients, Public Authorities, Contractors, Industries, Enquiries to Dealers – Article Writing: on Design or Building – Introduction to Design Basis Report – Proposal Writing – Email Etiquette

Exercises: Essay on Architecture, Article on Designing, Listening Passage, Business Proposal, Resume, Letter Writing, Email Writing, Technical Presentation.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: The ability to strengthen technical writing and speaking

CO2: The ability to be proactively read, listen, speak and present facts in a persuasive manner in both oral and written medium

CO3: The ability to interact, translate and delegate information

CO4: The ability to face various levels of competitive examinations to upgrade educational and career options.

CO5: Strengthen Students' Creative skill

Course Outcome		Program Outcome								Program Specific Outcome		
CO'S		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	The ability to strengthen technical writing and speaking	3	-	-	-	-	-	-	-	-	-	3
CO2	The ability to be proactively read, listen, speak and present facts in a persuasive manner in both oral and written medium	3	-	-	-	-	-	-	-	-	-	3
CO3	The ability to interact, translate and delegate information	3	-	-	-	-	-	-	-	-	-	3
CO4	The ability to face various levels of competitive examinations to upgrade educational and career options.	3	-	-	-	-	-	1	-	1	-	3
CO5	Strengthen Students' Creative skill	3	-	-	-	-	-	1	-	-	-	3

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215ARE03 **DESIGN FUNDAMENTALS IN ARCHITECTURE** **L T P C**
2 0 0 2

COURSE OBJECTIVES:

- To make the students learn the theoretical aspects of design and understand how it could be manifested in architectural design
- Introduce the design process as a synthesis of a variety of factors, analyzed and studied.
- To develop a perception of space and a sense of visualization with the help of tools like sketches, drawings, models, computer animation etc.
- To inform the approaches that generate ideas for architectural design and the importance of the participatory approach to design.

UNIT I INTRODUCTION TO DESIGN **6 Hrs**

Definition of design, understanding of design, purpose of design, nature of good design and evaluation of design, types of design classifications, role of designer. Elementary principles of Architectural Design on the basis of structure, function and aesthetics.

UNIT II DESIGN THINKING **8 Hrs**

Understanding the terms - creativity, imagination, etc. Theories on thinking, convergent and divergent thinking, lateral and vertical thinking, creative techniques like checklists, brainstorming, blocks etc.

UNIT III DESIGN PROCESS **9 Hrs**

Context for architectural design problems, design process, stages in the design process from different considerations, different ideas of design methodology. Process of Architectural Designing, underlining its implicit need to match the emphasis on technical and aesthetical components.

UNIT IV CONCEPTS IN ARCHITECTURAL DESIGN **10 Hrs**

Various approaches to generate ideas for architectural design - types of concepts, - Ideas and Intent in design - Intuitive, contextual, Iconic, Experiential, Environmental, Energy based, Symbolic, Modular, etc. Ideologies and philosophies of architects

UNIT V DESIGN COMMUNICATION AND GRAPHICS **12 Hrs**

Importance of graphics in architectural design. Types of **diagrams** – graphic metaphors, are diagram, matrix diagram, network diagram, bubble diagram, circulation diagram, analytical diagram, schematic etc. – symbol, sign, and arrows – concept diagrams. Study of site plans, city plans, conceptual drawings. Interpretation of architects' conceptual sketches and the respective buildings.

TOTAL: 45 Hrs

COURSE OUTCOMES:

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

CO 1: Understand the process in designing of spaces and representation in a graphical format.

CO 2: Concepts and stages involved in development the design.

CO 3: Gained knowledge on architectural design a foundation in the conception of design Fundamentals in Architecture.

CO 4: Progressively introduce the design process as a synthesis of variety of factors analyzed and studied.

CO 5: Implemented the design ideas as a tool of communication and info graphical presentation.

TEXT BOOKS:

1. Structure in Architecture – Heller Robert and Salvadori Mario
2. Design Fundamentals in Architecture – V.S. Pramar
3. Architecture : Form, Space and order – Francis D. K. Ching

REFERENCES:

1.Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences – John Wiley & Sons, New York, 1981

2.Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984

3.Bryan Lauson - How Designers Think, Architectural Press Ltd., London, 1980.

4.Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984

Course Outcome		Program Outcome								Program Specific Outcome		
CO'S		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	Understand the process in designing of spaces and representation in a graphical format	3	3	3	2	1	-	1	-	3	2	-
CO2	Concepts and stages involved in development the design.	3	3	2	2	1	-	-	2	3	2	-
CO3	Gained knowledge on architectural design a foundation in the conception of design Fundamentals in Architecture.	3	3	2	2	1	-	1	-	3	2	-
CO4	Progressively introduce the design process as a synthesis of variety of factors analyzed and studied.	3	3	2	2	1	-	1	-	3	2	-
CO5	Implemented the design ideas as a tool of communication and info graphical presentation.	3	3	-	2	1	-	1	-	3	2	-

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315ART01	MECHANICS OF STRUCTURES – II	L T P C 2 1 0 3

COURSE OBJECTIVES:

- The student would learn how to work out shear force and bending moment on beams subjected to different loading conditions.
- The student would understand shear stress and bending stress distribution in beam sections.
- They would learn to find slope and deflection of beams.
- They learn behavior of long and short columns using Euler's and Rankin's formula.
- They learn the behavior of continuous beams, fixed beams and portal frames.

UNIT I SHEAR FORCE AND BENDING MOMENT **10 Hrs**

Concept of shearing forces and Bending Moments - shear force and bending Moment diagrams for cantilever and simply supported beams subjected to point load, uniformly distributed loads and their combinations.

UNIT II STRESSES IN BEAMS **10 Hrs**

Theory of simple bending -bending stresses in beams, shear stresses in beams - examples on simple sections. Stress distribution diagrams.

UNIT III DEFLECTION OF BEAMS **10 Hrs**

Slope and deflection at a section - Double Integration method for simply supported and cantilever beams for concentrated loads and uniformly distributed loads.

UNIT IV THEORY OF COLUMNS **10 Hrs**

Short and long columns - Euler's method and its limitations - Derivations of Euler's formula (for different end conditions) – Rankin's formula for columns (No derivations) – Application to simple problems.

UNIT V INTRODUCTION TO INDETERMINATE STRUCTURES **5 Hrs**

Concept in Analysis of continuous beams, fixed beams, and portal frames (No analysis problems).

EXERCISES

Students are expected to present simple models for types of beams using different materials for varying span. They are expected to submit a report on existing structures by doing field visit.

TOTAL: 45 Hrs

COURSE OUTCOMES:

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

CO 1: Apply the concepts of determining the techniques of finding the stresses.

CO 2: To achieve an overall and general understanding of behavior of structural elements. At this stage students shall be exposed to bending of beams and behavior of columns.

CO 3: Use the theory of simple bending theory to find the deflection in beams.

CO 4: Analyze and solve the different types of columns.

CO 5: Analyze the different types of indeterminate beams.

TEXT BOOKS:

1. R.K. Bansal, "A Text Book on Strength of Materials", Laxmi Publications, New Delhi, 2006.
2. B.C. Punmia, "SMTS-I, Strength of Materials", Laxmi Publications, New Delhi, 1994.

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.
5. Dr.V.S.Prasad, Basic Structural Mechanics, Galgotia Publications.
6. Timoshenko, S.P., and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Apply the concepts of determining the techniques of finding the stresses.	2	-	1	-	-	-	-	-	3	-	-
CO 2	To achieve an overall and general understanding of behavior of structural elements. At this stage students shall be exposed to bending of beams and behavior of columns.	2	-	1	-	-	-	-	-	3	-	-
CO 3	Use the theory of simple bending theory to find the deflection in beams.	2	-	1	-	-	-	-	-	3	-	-
CO 4	Analyze and solve the different types of columns.	2	-	1	-	-	-	-	-	3	-	-
CO 5	Analyze the different types of indeterminate beams.	2	-	1	-	-	-	-	-	3	-	-

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315ART03 **CLIMATE RESPONSIVE ARCHITECTURE** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To provide information on factors that contribute to climate and to trace out evolution of energy conscious building & techniques from historic period based on different climatic zones.
- To enable the student to understand the movement of sun in various parts of the globe, its paths, angels, the radiation levels and how to overcome the harmful effects through certain shading devices.
- The students are to be exposed to air movements into and around buildings resulting in various effects.
- To study the various methods & techniques to incorporate solar passive heating & cooling system through selective examples with stress on materials & design strategies.
- To provide information on various design consideration and parameters that are required for various climatic zones and as to how landscape could be integrated into building designs.

UNIT I INTRODUCTION TO CLIMATE & DESIGN PARAMETERS **12 Hrs**

Factors that determine climate - Components of climate – Introduction to Micro (site) climate – effects of local factors. Methods of recording of climatic data and Instruments used to record variations in components of climatic conditions- Characteristics of climate types & examples from regional/ vernacular architecture of different climatic regions. Design considerations, Building design & lay out planning consideration for warm humid, hot dry, composite and upland climates. Landscape design for various climate.

UNIT II SOLAR CONTROL **8 Hrs**

Apparent movement of the sun, sun path diagrams (solar chart). Solar geometry – solar chart - Sun angles and shadow angles - Design of solar shading devices. Understanding the sun path & shading devices, orientation of building, openings- sizes, position.

UNIT III HEAT FLOW THROUGH BUILDING MATERIALS **8 Hrs**

Thermal balance of the human body, Thermal comfort indices – Effective temperature, CET, comfort zone & calculation of overheated &under heated periods. Basic principles of Heat Transfer - Periodic heat flow in building – time lag & decrement factor & its application in selection of appropriate materials for walls & roof. Effect of Insulation & cavity on time lag & its practical use. Exercises on achieving the required indoor temperature by varying the components of composite materials according to the U values.

UNIT IV AIR MOVEMENT **7 Hrs**

Functions of ventilation – stack effect due to the thermal forces, wind velocity – wind rose diagram, wind pressure. Air movement through building & around buildings – factors affecting indoor air flow, wind shadow etc.

UNIT V HEATING & COOLING TECHNIQUES **8 Hrs**

General principles of heating- Direct gain - Thermal storage wall - sunspace - convective air loop – examples - General principles of cooling- Ventilation - Radiation - Evaporation and Dehumidification - Mass effect - examples.

Exercises:

- Information collection regarding the thermal properties of contemporary materials suited for various climatic zones.
- Calculations of shading devices using solar protractor & sunpath diagrams.

- Conceptual understanding of Air flow in Buildings

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: Understand the various factors of climate, the different zones, heat flow through materials-buildings, & the methods to incorporate energy efficient techniques in planning, design & detailing of buildings.

CO 2: Designing Climate responsive structure.

CO 3: Understanding of Thermal balance in Human beings.

CO 4: Conceptual understanding of Air flow in Buildings.

CO 5: To create an awareness on how architecture to a large extent being get influenced to climate

TEXT BOOKS:

1. O.H. Koenigsberger and Others, " Manual of Tropical Housing and Building" – Part I - Climate design, Orient Longman, Madras, India, 2010.
2. Bureau of Indian Standards IS 3792, "Hand book on Functional requirements of buildings other than industrial buildings", 1987.

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", Elsivier Science Ltd., Oxford, U.K., 1998.
5. Donald Watson and Kenneth Labs., Climatic Design – McGraw-Hill Book Company - New York - 1983.
6. Joseph de chiarra and Le Copplemann - Planning and Design Corieteria – McGraw-Hill, New York 1983.
7. B. Givoni, "Passive and Low Energy Cooling of building", Van Nortrand Reinhold New York, USA, 1994.
8. The climate dwelling – an introduction to climate rsposive residential – by eoin o cofaigh, john aolley- 1996
9. Energy-efficient buildings in india – by milimajumdas, tata energy research institute – ministry of non-conventional resources.

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Understand the various factors of climate, the different zones, heat flow through materials-buildings, & the methods to incorporate energy efficient techniques in planning, design & detailing of buildings.	2	3	2	-	3	-	-	2	3	3	1
CO 2	Designing Climate responsive structure.	3	3	3	-	-	-	-	2	3	3	-
CO 3	Understanding of Thermal balance in Human beings.	2	3	3	-	3	-	-	-	2	3	-
CO 4	Conceptual understanding of Air flow in Buildings.	3	3	2	1	-	-	-	1	3	2	-
CO 5	To create an awareness on how architecture to a large extent being get influenced to climate	3	3	2	1	-	-	-	-	-	1	-

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315ART04 **ENVIRONMENTAL SCIENCE AND ENGINEERING** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To make students understand theoretically fundamentals of sewage treatment, their collection and disposal at campus level construction system involved in services.
- To make students understand other city level disposal collection, conveyance, recycling, storm water drains and dispersals.
- To make students understands the importance of water quality, its purification treatments at city level and distribution in small towns and at individual building level.
- To enable student to have knowledge on rainwater harvesting, management and how to recycle other waste water from the buildings and at city levels.
- To provide knowledge on causes of pollution, social issues, acts regarding environment and renewable and non-renewable resources.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 10 Hrs

Definition, scope and importance of environment – need for public awareness - Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity-case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill /mountain.

UNIT II ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY **14 Hrs**

Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hotspots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT III ENVIRONMENTAL POLLUTION **8 Hrs**

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT **7 Hrs**

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – enforcement machinery involved in environmental legislation- central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT **6 Hrs**

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

EXERCISES:

- To submit articles and posters on creating awareness regarding environment and planting trees inside the campus.
- To do a brief report submission on collection and disposal of municipal wastes in Hosur town.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: Students are sensitized on the need for natural resource management, and sustainable lifestyles.

CO2: Students appreciate the value of ecosystem and the need and methods for conserving the same.

CO3: Students understand the how pollution and hazards can be mitigated.

CO4: To sensitize students that efficiency of building function also depend on integration of services like sewage disposal system, water supply systems, identification of sources, segregation, treatment, augmentation, distribution, the important equipment and gadgets involved.

CO5: Enhanced the knowledge of all types of resources and the pollution caused to it.

TEXT BOOKS:

1. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", 2 edition, Pearson Education, 2004.
2. Erach Bharucha, "Text book of Environmental Studies", University Press, Hyderabad, 2006.
3. Anubha Kaushik and Kaushik C.P., "Perspectives in Environmental Studies" New age International (P) Ltd., New Delhi, 2005.
4. Venugopala Rao.P, "Principles of Environmental Science and Engineering" Prentice Hall of India Pvt. Ltd., New Delhi, 2006.

REFERENCES:

1. Cunningham, W.P. Cooper, T.H. Gorhani, "Environmental Encyclopedia", Jaico Publ., House, Mumbai, 2001.
2. Dharmendra S. Sengar, "Environmental law", Prentice hall of India PVT LTD, New Delhi, 2007
3. Rajagopalan, R, "Environmental Studies-From Crisis to Cure", Oxford University Press, 2005
4. Richard T. Wright, "Environmental Science" Prentice Hall of India Pvt. Ltd., New Delhi, 2007

5. G.M.Fair, J.C.Geyer and D.Okun, Water and Waste Water Engineering, Vol. II, John Wiley & Sons, Inc., New York, 1968..
6. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
7. McKinney, M.L & Schoch, R.M. 1996. Environmental Science System & Solutions, Web enhanced edition. 639p.
8. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Students are sensitized on the need for natural resource management, and sustainable lifestyles.	2	3	2	-	-	-	-	-	1	3	-
CO 2	Students appreciate the value of ecosystem and the need and methods for conserving the same.	-	-	2	-	-	-	-	-	2	2	-
CO 3	Students understand the how pollution and hazards can be mitigated	2	3	3	-	-	-	-	-	1	1	-
CO 4	To sensitize students that efficiency of building function also depend on integration of services like sewage disposal system, water supply systems, identification of sources, segregation, treatment, augmentation, distribution, the important equipment and gadgets involved.	2	-	2	1	-	-	-	1	2	2	-
CO 5	Enhanced the knowledge of all types of resources and the pollution caused to it.	1	-	2	1	-	-	-	-	-	1	-

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315ART05 **MATERIALS AND CONSTRUCTION - III** **L T P C**
2 0 4 4

COURSE OBJECTIVES:

- To provide basic theoretical knowledge on cement, and Glass, their types, properties and application to buildings.
- To expose the students on theoretical knowledge on preparation of concrete, grading of the same, need for and types of reinforcement and applications at the site.
- To enable the students to understand application of concrete in foundations, floors, walls, columns, beams and slabs through theory and practical knowledge through scaled construction drawings.
- To provide adequate theoretical exposure on various factors involved in staircase design, their types, structural supports required and finishing details. Practical knowledge on types, foundations, fixing and finishing details will be through scaled construction drawings.
- To provide basic theoretical knowledge on composition of glass, idea about manufacture their types.

UNIT I CEMENT **6 Hrs**

Varieties of cement, composition, properties and uses - tests for cement - mortar for various works.

UNIT II CONCRETE, IT'S INGREDIENTS AND PROPERTIES **16 Hrs**

Ingredients - suitability requirements for aggregates, grading of aggregates – water mix in concrete - reinforcement - admixtures - properties of concrete.

Concreting process its properties - mix proportioning - batching, mixing, transporting, placing, compaction, curing, formwork - quality control - tests for concrete - joints in concrete -concrete finishes.

UNIT III CONCRETE CONSTRUCTION **27 Hrs**

Introduction to framed structures. Concrete in foundations - types of footings - isolated, combined, continuous, strap. Concrete floors (PCC), walls and partitions. Concrete lintels, sunshades. Concrete beams and columns and slabs – one-way and two-way slabs.

UNIT IV CONCRETE STAIRCASES **18 Hrs**

Factors involving staircase design - types of staircases like straight flight, doglegged, quarter turn, bifurcated, spiral helical, etc. - different support conditions like inclined slab, cranked slab, continuous, cantilever - foundations finishes for staircases - detailing out of handrails and balusters. Designing and detailing for physically handicapped.

UNIT V GLASS **8 Hrs**

Composition of glass - brief study on manufacture, treatment properties and uses of glass - special types of glass, sheet glass, plate glass, safety glass, tinted and coated glass -glass blocks - properties and applications in the building industry - current developments. Detailing for physically handicapped.

EXERCISES:

- Students are asked to collect materials and document the properties of concrete and glass building materials.
- Exercises involving construction of stair cases using different materials.

TOTAL: 75 Hrs

COUSRE OUTCOMES:

CO1: The students understood how Reinforced Cement Concrete could be used for the various components of a building as well as in waterproofing and insulation and protection systems.

CO2: The role of advanced construction systems that have been developed by research institutes throughout the country were also explored.

CO3: Quality assurance and testing methods, after looking at the basics and research explorations associated with the materials were looked at.

CO4: To introduce knowledge on how cement, concrete and reinforcements are used in various components of buildings like foundations, columns, beams, slabs and staircases.

CO5: Gained knowledge on use of glass, treatment processes, properties and applications in building industry in buildings.

TEXT BOOKS:

1. M.S.Shetty, "Concrete Technology", S.Chand & Co.ltd, New Delhi, 1986.
2. Dr. B.C.Punmia, "A Text book of Building Construction", Laxmi Publications Pvt. Ltd., New Delhi, 2005.
3. T.D Ahuja and G.S. Birdie, " Fundamentals of Building Construction", Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996
4. S.P Arora and S.P Bindra, " A Text Book of Building Construction", Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1990
5. Alan Blanc, "Stairs, Steps and Ramps", Butterworth, Heinemann Ltd., 1999

REFERENCES:

1. Francis D.K. Ching, "Building Construction illustrated", John Wiley & Sons, 2000
2. W.B. McKay, "Building Construction", Vol 1 and 2, Longmans, UK, 1981.
3. Barry, "Construction of Buildings", Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005
4. Pamphlet and Manuals supplied or published by SERC, BMPTC, HUDCO and Other research
5. organization
6. R.M. Davis, "Plastics in Building Construction", Battersea College of Technology, Blackie,
7. London, 1966
8. S.C.Rangwala, Engineering Materials, Charotar Publishing House, India, 1997.
9. Alan Banc, Stairs, Steps and Ramps, Butter worth Heinemann ,1996
10. M.S.Shetty, Concrete Technology, S.Chand& Co. Ltd., New Delhi, 1986.

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students understood how Reinforced Cement Concrete could be used for the various components of a building as well as in waterproofing and insulation and protection systems.	2	3	3	-	2	-	-	3	3	3	-
CO 2	The role of advanced	3	3	3	-	3	-	-	3	2	3	1

	construction systems that have been developed by research institutes throughout the country were also explored.											
CO 3	Quality assurance and testing methods, after looking at the basics and research explorations associated with the materials were looked at.	1	2	2	-	-	-	-	2	3	1	-
CO 4	To introduce knowledge on how cement, concrete and reinforcements are used in various components of buildings like foundations, columns, beams, slabs and staircases	3	-	2	1	-	-	-	1	2	2	-
CO 5	Gained knowledge on use of glass, treatment processes, properties and applications in building industry in buildings.	3	-	2	1	-	-	-	-	-	3	-

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315ARP06 **COMPUTER AIDED DESIGN STUDIO II** **L T P C**
0 0 6 3

COURSE OBJECTIVES:

- To enable the student understand basic interface and editing necessary for creating 3D objects.
- To enable the student an understanding of tools for creating 3D objects and understanding of modification tools for the same.
- To enable the student an understanding of finishing and output of the 3D model construction of a 3D model.

UNIT I PRODUCTIVITY TOOLS **12 Hrs**

Introduction to tools of productivity -blocks, slide facilities, script files, attributes Understanding concepts of V.Port, concept of object linking, and editing session.

UNIT II INTRODUCTION TO 3D DRAFTING **24 Hrs**

Introduction to 3D modeling technique and construction planes, drawing object, 3D surfaces setting up elevation and thickness, and use of dynamic projections.
Tools: Slide facilities script attributes, V-port, editing session. Introduction to 3D-modelling Technique and construction planes, drawing objects, 3D surfaces setting up elevation thickness and use of dynamic projections. Solid modeling with primitive command and Boolean operation.

UNIT III 3D RENDERING AND SETTING **24 Hrs**

Project: Visualize a building. Explore the potential of lights and camera and use the same in the model created for the final submission. Tools: Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filling. Exercise to identify and visualize a building using the above said utilities. 3D modelling softwares like sketch up, Autocad rivet, etc. Rendering and scene setting to create a photo realistic picture, understanding material mapping, environment setting and image filing.

TOTAL: 60 Hrs

COURSE OUTCOMES:

CO1: The students benefit by learning software which helps them to better visualize complicated forms and also helps in producing photo realistic images of those 3D forms
CO2: Exposed to tools of productivity, concept of object linking and editing session, with a thrust on 3D drafting and 3D rendering as a necessity for architects.
CO3: Experienced construction planes, 3D surfaces, use of dynamic projections, techniques of setting to create photo realistic pictures.

TEXT BOOKS:

1. Deke McClelland, "Photoshop 7 Bible Professional Edition", Wiley John & Son INC, New York, 2000.
2. A. Watt, "Fundamentals of Three-Dimensional Computer Graphics", Addison Wesley, Massachusetts, 1989.
3. Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon process, 2012

REFERENCES:

1. Sham Tickoo, Advance Technique in AutoCAD Re.14 - 1997
2. V.Rajaraman, Principles of Computer Programming - Prentice Hall of India.

3. Byron S.Gottfried, Theory and problems of programming with C.Schaum's outline series, McGraw-Hill Publishing Co.
4. AutoCAD reference manual - Autodesk UNC, 1998.
5. AutoCAD architectural users guide - Autodesk Inc., 1998.
6. Sham Tickko, Understanding AutoCAD - 14 (Windows) - 1997.
7. Deke McClelland, "Photoshop 7 Bible Professional Edition", Wiley John & Son INC, New York, 2000.
8. A. Watt, "Fundamentals of Three-Dimensional Computer Graphics", Addison Wesley, Massachusetts, 1989.
9. Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon process, 2012

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students benefit by learning software which helps them to better visualize complicated forms and also helps in producing photo realistic images of those 3D forms	-	-	-	-	3	3	-	2	-	2	3
CO 2	Exposed to tools of productivity, concept of object linking and editing session, with a thrust on 3D drafting and 3D rendering as a necessity for architects.	-	-	-	-	3	3	-	2	-	2	3
CO 3	Experienced construction planes, 3D surfaces, use of dynamic projections, techniques of setting to create photo realistic pictures.	-	-	-	-	3	3	-	2	-	2	3

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315ARP07 **DESIGN STUDIO – III** **L T P C**

0 0 10 5

COURSE OBJECTIVES:

- To enable student to familiarize with the given design topic by choosing, relevant and appropriate case studies within the region visiting the sites and analyzing the same.
- To expose him/her to knowledge available on the relevant design at international level, through books and websites and to understand and develop the Aesthetic components involved in the Design subject.

1. DESIGN STUDIO **100 Hrs**

Single level planning in small scale, small span, horizontal movement and simple vertical movement, data collection, case studies, analysis and presentation of studies – Data collection with respect to design and detailing for physically handicapped persons - Concepts and presentation of design with scaled models

Examples: Residential buildings, Institutional buildings: banks, nursery or primary schools, primary health center, school for children with learning disabilities, neighborhood market, etc.

2. COMPUTER LAB STUDIO **80 Hrs**

Introduction to computer aided drafting system, concepts of real dimensions, colors, symbols, repeatability modification, layers. Exercises related to design projects above.

TOTAL: 180 Hrs

COURSE OUTCOMES:

CO1: The students were exposed to the various components and aspects associated with design concepts and its evolution in public spaces.

CO2: They were also explored to the anthropometric detail for physically handicapped persons in public buildings and to document and present the related details collected for the design.

TEXT BOOKS:

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 Neuferts, "Architects Data," Blackwell, 2002.
5. Ramsey et al, "Architectural Graphic Standards", Wiley, 2000.

REFERENCES:

1. Ed.by. Quentin Pickard RIBA - The Architects' Hand Book - Blackwell Science Ltd. - 2002.
2. De Chiara and Callender, Time Saver Standards Building Types, McGraw-Hill Co., 2nd Edition, 1980.
3. Edward D.Mills, Planning - The Architects Handbook - 10th Edition, British Library C Taloguing in Publication Data, 1985.P&D Act 1995.
4. Neufet Architect's Data, Rudoll Herg, Crosby Lockwood and Sons Ltd., 1970.

5. Wakita\Linde, The Professional practice of Architectural working, drawing John Wiley & Sons, 1984.
6. Andrew Alpern, Handbook of Speciality Elements in Architecture, McGraw Hill Book Co., 1982.
7. Julius Panero& Martin Zelnik, Human Dimension and Interior Space, Whitney Library of Design Publication, 1979.

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students were exposed to the various components and aspects associated with design concepts and its evolution in public spaces	3	3	3	2	3	-	-	2	3	3	2
CO 2	They were also explored to the anthropometric detail for physically handicapped persons in public buildings and to document and present the related details collected for the design.	2	3	3	-	-	-	-	1	3	3	3

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315ARE02 **MODULAR CO-ORDINATION** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To provide an introduction to conventional modular principles and practices in India and abroad.
- To ensure the dimensional co-ordination between installation and erection.
- To enable buildings to be so dimensioned that they can be erected standard components without undue restriction on freedom of design.
- To Study of historical background of industrialized building in other countries and Indian experience.
- To enable buildings to be so dimensioned that they can be erected standard components without undue restriction on freedom of design.

UNIT I INTRODUCTION TO MODULAR SYSTEMS **8 Hrs**

Various elements of buildings that could be modular walls, roofs, doors and windows, partitions, etc. Various materials used in modular architecture. Pre-stressed and post-tensioned modular systems.

UNIT II DEVELOPMENT OF MODULAR ARCHITECTURE **4 Hrs**

Development of theories of modular architecture. Advantages, scope and limitations of modular architecture.

UNIT III MODULAR ARCHITECTURE AND CO-ORDINATION **8 Hrs**

Basic management policies in modular co-ordination. Prefabricated structures: their uses with examples and techniques of constructions.

UNIT IV INTRODUCTION & ORIGINS OF THE INDUSTRIALISED CONCEPT **14 Hrs**

Principles of prefabrication of cellular structures, Space frames, tensile structure, pneumatic structure. Definition of Industrialization. Study of historical background of industrialized building in other countries and Indian experience. Study of CBRI and SERC works. Use of latest construction techniques like Tunnel form system, Triple S System, etc.

UNIT V ASPECTS OF INDUSTRIALISATION **11 Hrs**

Case Studies of Industrialized Buildings in India and abroad. Scope & limitations on applicability in industrial housing etc. Socio-economic situations, spatial requirements. Application of Industrialization in Mass Housing.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: The students understood the role of different material and techniques adopted in modular construction.

CO 2: They were made aware of various aspects in prefabricate structures.

CO 3: Exercise based on the latest construction techniques and presentation to be done on the live case studies of the known architects.
CO 4: Exercise done in model making on tensile structures, space frames etc to get the better understating.
CO 5: Exposed to the impact of industrialization on the space requirements.

TEXT BOOKS:

1. Akvert, G.H Dietz Culter Lawrence (ed) 'Industrial Building system for Housing'
2. Bauverlag & Wiesbaden 'Manual of Precast Concrete Construction System Buildings with Large panels'

REFERENCES:

1. W. Minich, J. Pekala, Modular Coordination in Industrial Building: Standard Regulations; Preliminary Scheme; ISO/TC 59
2. National Building Code of India, 1983
3. Heki.K (ed) 'Shells, Membranes and space frames' Elsevier, .Sarja A. 'Open and industrial Buildings'
4. Gabind , Fracols 'Beyond the Cube The Architecture for Space Frames and Polyhedral'

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students understood the role of different material and techniques adopted in modular construction.	3	3	-	-	-	-	-	3	2	3	-
CO 2	They were made aware of various aspects in prefabricate structures.	2	1	-	-	-	-	-	2	3	3	1
CO 3	Exercise based on the latest construction techniques and presentation to be done on the live case studies of the known architects.	1	2	2	-	-	-	-	3	2	3	1
CO 4	Exercise done in model making on tensile structures, space frames etc to get the better understating.	3	3	-	-	-	-	-	2	-	2	3
CO 5	Exposed to the impact of industrialization on the space requirements	-	3	2	-	-	3	-	2	3	3	2

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315ARE04 **VERNACULAR ARCHITECTURE** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To study the approaches, definition, concepts and typologies of the vernacular architecture of a region for better understanding, comprehension and interpretation.
- To understand the role of locally available or indigenous materials and climate in the architecture expression of Northwestern India through case studies.
- To understand the regional expression in the architecture of southern India through the study at settlements and unit levels through case studies.
- To study the colonial influences in India and understand the character of the multi cultured architectural expression through case studies.
- To understand the elements and character of vernacular architecture in the public and royal buildings of Northwestern India.

UNIT I INTRODUCTION **9 Hrs**

Approaches and concepts to the study of Vernacular Architecture Aesthetic Anthropological Architectural Developmental - Geographical - Historical Spatial - Folkloristic.

UNIT II TRADITIONAL PRINCIPLES OF PLANNING IN WEST& NORTH INDIA **10 Hrs**

Primitive forms, symbolism, colour, Folk Art, etc. in the Architecture of the Deserts of Kutch and Gujarat State. Town planning principles of the towns of Jodhpur, Jaipur, Jaisalmer, Gwalior, etc.

UNIT III SUBTERRANEAN ARCHITECTURE **6 Hrs**

Wooden Houses & Mansions (Havelis) Gujarat & Rajasthan - Houseboats (Dhungas), Kashmir - Materials of Construction & Construction detail.

UNIT IV VERNACULAR ARCHITECTURE OF SOUTH INDIA **12 Hrs**

Wooden Houses, palaces & Theatres in Kerala. Traditional houses of Tamil Nadu Eg: Agriculture settlement, Weavers Settlement & Chettinad houses and palaces. Vernacular architecture of Malanad – Karnataka. - Principles of Planning, proportion & religious practices & beliefs & culture, materials of construction & construction detail & settlement planning.

UNIT V WESTERN INFLUENCES ON VERNACULAR ARCHITECTURE **8 Hrs**

Colonial influences on the Traditional House, Goa, and change - Bangla & Bungalow, Bengal and Victorian Villas - Planning Principles, materials & methods of construction - House Typologies, settlement Planning, Pondicherry & Cochin.

TOTAL : 45 Hrs

COURSE OUTCOMES:

CO 1: Students will be able to understand the character of the multi cultured architectural expression through case studies.

CO 2: Documented and presentation on planning principles of different towns for their better understanding of local culture.

CO 3: Gained knowledge on various manmade and nature forces behind the evolution of traditional architecture.

CO 4: Also understood the overlapping and the influence of anthropology, sociology and culture in the architecture style and character of a region.
CO 5: Enabled them to understand the impact of colonial architecture on settlement pattern and houses.

TEXT BOOKS:

1. Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
2. Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
3. R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.

REFERENCES:

1. G.H.R. Tillotsum - The tradition of Indian Architecture Continuity, Controversy - Change since 1850, Oxford University Press, Delhi, 1989.
2. V.S.Praman, Havali - Wooden Houses & Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
3. Kullrishan Jain & Minakshi Jain - Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad, 1992.
4. Carmen Kagal, VISTARA - The Architecture of India, Pub: The Festival of India, 1986.

Course Outcomes		Program Outcomes (PO's)								Program Specific Outcomes PSO's		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Students will be able to understand the character of the multi cultured architectural expression through case studies	3	3	-	2	1	-	-	2	3	3	3
CO 2	Documented and presentation on planning principles of different towns for their better understanding of local culture.	3	3	3	3	2	-	-	-	3	3	2
CO 3	Gained knowledge on various manmade and nature forces behind the evolution of traditional architecture.	-	3	2	-	1	-	-	1	3	3	1
CO 4	Also understood the overlapping and the influence of anthropology, sociology and culture in the architecture style and character of a region.	3	1	-	-	-	-	-	2	-	2	3
CO 5	Enabled them to understand the impact of colonial architecture on settlement patternand houses.	2	1	-	-	-	3	-	2	3	3	2

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415ART01 **ANALYSIS & DESIGN OF STRUCTURES – I** **L T P C**
2 1 0 3

COURSE OBJECTIVES:

- To introduce the design of various timber components in a building.
- To sensitize students on timber and steel structures. At this stage they would be exposed to the design of timber joists to riveted and welded joints and steel beams and columns.
- To enable the understanding of the types, efficiency, strength, advantages and disadvantages of Riveted, Bolted` and welded joints in steel.
- To enable the design of Tension (beams) and compression (columns) steel members in a building under various conditions.

UNIT I TIMBER STRUCTURES **7 Hrs**

Grading of Timber – Permissible Stresses – Design of timber beams – Madras terrace roof Design of timber columns. Design requirements from National Building Code. Case study of building with timber structures.

UNIT II STEEL STRUCTURES – RIVETED, BOLTED AND WELDED JOINTS **12 Hrs**

Properties of rolled steel sections. Assumptions – failure of Bolted joints – Strength and Efficiency of Bolted Joints – Types – Design of Bolted Joints for Axially Loaded Members (Excluding eccentric connections).Types of welded joints – Advantages and disadvantages – Design of Fillet welds (Excluding eccentric connections).Riveted joints, Basic principles of riveted joints (Excluding eccentric connections). Case study of building with Steel structures.

UNIT III TENSION MEMBERS **8 Hrs**

Introduction – Net sectional area – permissible stresses. Design of Axially loaded Tension member – Lug angle – code provision – tension splice.

UNIT IV STEEL BEAMS **8 Hrs**

Introduction – laterally supported and unsupported beams – Allowable stresses, General specifications, Design of laterally supported beams. Case study of building with Steel structures.

UNIT V STEEL COLUMNS **10 Hrs**

Introduction – various shapes – built up section Allowable stresses. Design of columns (excluding built – up columns lacing, battening and other connections). Case study of building with Steel structures.

TOTAL: 45 Hrs

COURSE OUTCOMES:

At the end of the course, the students will be able to understand:

CO 1: Design of steel joints for maximum efficiency and strength.

CO 2: Tension members and columns are designed for various conditions by applying the codal provisions.

CO 3: Design of axially loaded steel columns.

CO 4: Basic knowledge about concrete.

CO 5: Design of one way and two way RC slabs.

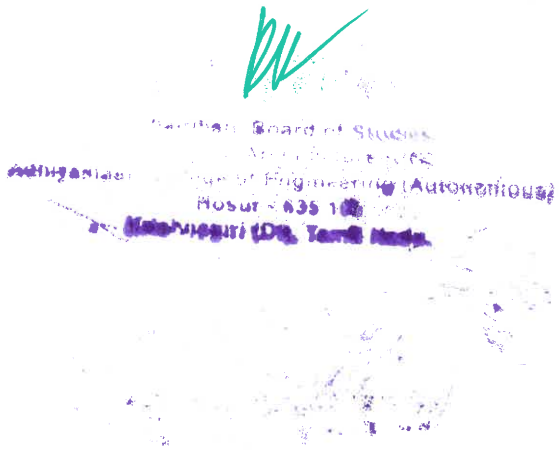
TEXT BOOKS:

1. M.R. Shiyekar, "Limit State Design in Structural Steel", PHI Learning Private Limited, 2010.
2. N. Subramanian, "Design of Steel Structures", Oxford Higher Education, 2008.

REFERENCES:

3. S.K. Duggal, "Limit State Design of Steel Structures", McGraw Hill Education, Private Limited,
   2010.
4. Dr. V. L. Shah, Prof. Veena Gore, "Structures Publications", Pune, 2012.
5. S.S. Bhavikatti, "Design of Steel Structures" by Limit State Method as per IS800-2007, I.K.
6. International Publishing House Pvt, Ltd, 2012.
7. Ramachandra S., Design of Steel Structures, Standard Book House, Delhi, 1984.
8. A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
9. Timber code , steel codes
10. Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
11. Negi "Design of steel Structures", Tata McGraw-Hill Book Company, New Delhi 1997.
12. Timber Construction Manual
13. Steel Construction Manual

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Design of steel joints for maximum efficiency and strength	1	3	-	-	-	-	-	1	3	-	3
CO 2	Tension members and columns are designed for various conditions by applying the codal provisions.	1	3	-	-	-	-	-	1	3	-	3
CO 3	Design of axially loaded st columns.	1	3	-	-	-	-	-	1	3	-	3
CO 4	Basic knowledge about concrete.	1	3	-	-	-	-	-	1	3	-	3
CO 5	Design of one way and two way RC slabs	1	3	-	-	-	-	-	1	3	-	3



415ART03 **SITE PLANNING & ANALYSIS** **L T P C**
2 0 2 3

COURSE OBJECTIVES:

- To understand the importance of site and its content in architectural creations
- To orient the students towards several influencing factors which govern the siting of a building or group of buildings in a given site.
- To teach various techniques of site analysis through exercises and case studies.
- To teach the students the methodology of preparing a site analysis diagram.
- To mainly serve as a prelude to any architectural creation through exercises.

UNIT I INTRODUCTION **6 Hrs**

Definition of plot, site, land and region, units of measurements. Introduction to survey, methods of surveying, where they are used, Surveying Instruments and their application. Need for surveying. Measuring and drawing out a site plan from the measurements.

UNIT II SITE ANALYSIS **15 Hrs**

Importance of site analysis. Introduction to existing master plans and land use for cities. Site Inventory: natural, cultural, man-made and aesthetic factors. Preparation of site analysis diagram. Preparation of maps of matrix analysis & composite analysis – Case studies and exercises on the above.

UNIT III DETAILED ANALYSIS AND TECHNIQUES **8 Hrs**

Study of land form; Characteristics of contours, direct and indirect methods of contouring, interpolation, slope analysis, grading process, grading criteria, functional and aesthetic considerations. Study of microclimate: vegetation, landforms and water as modifiers of microclimate. Analysis of Site services –surface drainage, irrigation system - sources of water supply and means of waste disposal system.

UNIT IV SITE DRAWINGS **8 Hrs**

Computation of area by geometrical figures and other methods. Drawing marking out plan, layout plan and centerline plan – Importance, procedure for making these drawings and dimensioning. Setting out the building plan on site – Procedure and Precautions. Exercises on the above.

UNIT V SITE LAYOUT PRINCIPLES **8 Hrs**

Organization of vehicular and pedestrian circulation, types of roads, hierarchy of roads, networks, road widths and parking, regulations. Turning radii & street intersections. Site selection criteria for housing development, commercial and institutional projects.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: The contextual importance on site analysis can be understood based on the various site factors with respect to the study area.
CO 2: To document on-site and off-site factors, contour analysis and grading.
CO 3: Various scientific and analytic site analysis techniques is understood.
CO 4: A methodological approach for preparation of master plans for small scale and large scale projects can be understood.
CO 5: To prepare site analysis diagram (Housing development, commercial and institutional projects)

TEXT BOOKS:

1. Kevin Lynch, "Site planning", MIT Press, Cambridge, MA, 1984.
2. Edward. T. Q., "Site Analysis", Architectural Media, 1983.

REFERENCES:

1. B.C.Punmia, Ashok K. Jain, Ashok Kr. Jain, Arun Kr. Jain, "Surveying", Vol.I, Firewall Media, 2005.
2. P.B.Shahani, "Text of surveying", Vol. I, Oxford and IBH Publishing Co, 1980
3. Joseph De.Chiarra and Lee Coppleman, "Urban Planning Design Criteria", Van Nostrand Reinhold Co., 1982.
4. Storm Steven, "Site engineering for landscape Architects", John wiley& Sons Inc, 2004.
5. Second Master Plan – Development Regulations – CMDA, 2008.
6. Introduction to Landscape – John Moltoch

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The contextual importance on site analysis can be understood based on the various site factors with respect to the study area.	3	3	-	-	-	-	-	1	2	1	3
CO 2	To document on-site and off-site factors, contour analysis and grading.	3	3	-	1	-	2	-	1	-	-	-
CO 3	Various scientific and analytic site analysis techniques is understood.	3	2	3	1	-	1	-	-	1	1	1
CO 4	A methodological approach preparation of master plans for sm scale and large scale projects can understood.	3	3	-	-	-	-	-	-	-	-	1
CO 5	To prepare site analysis diagr (Housing development, commerc and institutional projects)	3	3	2	2	3	2	1	-	-	-	-

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415ART04 **BUILDING SERVICES I** **L T P C**
2 0 2 3

COURSE OBJECTIVES:

- To Study Water supply, treatments, distribution and plumbing system for all type of buildings.
- To Study Waste water treatments, Sewer lines for all types of buildings.
- To Study Drainage system for a Small Campus and a Residential neighborhood.
- To understand Refuse collections, disposal, composting, Landfill, Bio gas for a Town and City.
- Applications of all the above systems to a Buildings, Small Campus and a Residential neighborhood.

UNIT I WATER QUALITY, TREATMENTS AND DISTRIBUTION **8 Hrs**

Sources of water; Collection & treatment of water from different sources; Drinking water standards; Estimation of water requirement for all type of residential, commercial, Industrial buildings and for town - per capita demand, storage, distribution systems, Modern plumbing system - layout & design considerations.

UNIT II WATER SUPPLY **8 Hrs**

Components of water supply - selection & sizing, Distribution and network. Choice of pipe materials - Types of fixtures and fittings – System of plumbing in all type of buildings. Piping systems - in low, medium, high-rise buildings & residential layouts; Case studies & design problems; Codes & standards; Symbols for representation.

UNIT III WASTE WATER, TREATMENTS AND DISPOSAL **12 Hrs**

Sanitation: Purpose & Principles; Systems of sanitation; House drainage (sewage, sullage) collection & disposal fittings for low, medium & high rise Buildings; Community drainage - STP, oxidation pond, soil absorption system; Sewage effluent disposal; Rural sanitation; Codes & standards; Plumbing drawing. Waste water – Sewage disposal, primary treatment. Secondary treatment, Biological treatment and Modern types of Sewage Treatment Plants - Sewer line fixtures and traps, Manholes, Septic tank.

UNIT IV STORM WATER DRAINAGE AND RAIN WATER HARVESTING **8 Hrs**

Basic principles of storm water drainage, urban drainage; Sub soil drainage; Basement drainage; Storm water drainage system, Drainage: Types & layout of drainage systems - Drains, materials, workmanship, clearing; Codes & standards. Rainwater harvesting principles – storage sumps. Case studies and Rain water Harvesting for small residential neighborhood.

UNIT V SOLID WASTE MANAGEMENT **9 Hrs**

Types of Refuse; Importance of SWM; Segregation, collection, treatment & disposal at different scales & typologies; Recycling; Incinerator, Composting, Vermicomposting, Sanitary Land filling, Biogas system and Modern renewable energy system. Best practices; Economic benefits. Case studies - disposal for a housing colony and small neighborhood.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: Students have through understanding of how water and waste water are managed, in residential unit, small campus and for a large city.

CO 2: Exposed students about the efficiency of building function also depend on integration of services like water supply.

CO 3: Understood about the Sewage disposal system, the important equipment and gadget involved, their installation and maintenance.
CO 4: Gained knowledge on the storm water management and techniques.
CO 5: Students are aware of the principles and best practices for Solid waste management in residential unit, small campus and for a large city.

TEXT BOOKS:

1. Manual of water supply and treatment, Second edition, CPHEEO, Ministry of works and housing, New Delhi, 1977
2. AFE Wise, JA Swaffied Water, "Sanitary & Waste Services in buildings", V Edition, Mitchell Publishing, Co. Ltd., 2002.
3. Punmia B.C., "Waste Water Engineering", Laxmi Publications, 2009.
4. Arceivala S.J., "Waste Water Treatment for Pollution Control", Tata McGraw Hill, 2008.
5. S.C.Rangwala, "Water supply and sanitary engineering", Chartar publishing house, Anand, 1989.

REFERENCES:

1. G.M. Fair, J.C. Geyer and D.Okun, "Water and Waste water engineering", Volume II, John Wiley & Sons, Inc. New York, 1968
2. Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, NewDelhi, 1980.
3. Charangith shah, Water supply and sanitary engineering, Galgotia publishers.
4. A.Kamala & DL Kanth Rao, Environmental Engineering, Tata McGraw – Hill publishing company Limited. Technical teachers Training Institute (Madras), Environmental Engineering, Tata McGraw Hill publishing Company Limited.
5. Marrimuthu et al., Environmental Engineering, Pratheeba publishers.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Students have through understanding of how water and waste water are managed, in residential unit, small campus and for a large city.	3	2	2	-	-	3	-	3	-	2	2
CO 2	Exposed students about the efficiency of building function also depend on integration of services like water supply.	3	3	-	-	2	-	2	-	3	-	3
CO 3	Understood about the Sewage disposal system, the important equipment and gadget involved, their installation and maintenance.	3	3	-	-	-	-	-	-	-	1	-
CO 4	Gained knowledge on the storm water management and techniques	-	-	-	3	-	-	-	-	-	-	2
CO 5	Students are aware of the principles and best practices for Solid waste management in residential unit, small campus and for a large city	1	-	-	3	-	-	-	3	-	-	2

415ART05 **MATERIALS & CONSTRUCTION IV** **L T P C**
1 0 4 3

COURSE OBJECTIVES:

- To study ferrous and non-ferrous materials in construction and to have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such steel and steel alloys, aluminum and aluminum alloys.
- To understand the progressive achievements from cast – iron to steel, types of steel, its properties, application in construction industry and current developments. (Theory Only)
- To understand in detail through drawings, the types of sections in steel, joints, application in foundation, columns, beams and trusses and basically on concept of space frames.
- To understand aluminum alloys, its properties, products and other Non – Ferrous metals like copper, bronze, tin and lead are used in construction industry. (Theory only)
- To understand in detail through working drawings, the various types of aluminum doors, windows, ventilators, partitions and roofing system as applied in construction industry.

UNIT I **FERROUS METALS** **8 Hrs**

Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: structural steel, stainless steel, steel alloys – properties and uses- Current development.

UNIT II **STEEL SECTIONS JOINTS AND STEEL CONSTRUCTIONS** **25 Hrs**

Drawings: Steel joints and connections - Design exercises using structural steel sections for walls, foundations, column-beam Connections-Steel trusses - simple trusses in steel. **Gates:** entrance gate, rolling shutter. **Steel components:** Steel doors, (sliding) steel windows (casement window & sliding window) **Steel stairs:** (spiral stair) - Support conditions for stairs and details- steel hand rails and balustrade, grill designs for windows. Detailing and specification for physically handicapped.

UNIT III **NON FERROUS METALS** **8 Hrs**

Aluminum and Aluminum Alloys - brief study on properties and uses - Aluminum products extrusions, foils, castings, sheets, etc. - brief study of other non-ferrous metals like copper, bronze brass, tin and lead, properties and uses – Study of protection to non- Ferrous metals and product such as andozing, powder coating and chromium plating-current developments.

UNIT IV **ALUMINIUM CONSTRUCTIONS** **20 Hrs**

Brief study of aluminium products- market forms of aluminium, aluminium extrusions- sketches of the above - Aluminium doors and windows - design details for doors (openable, sliding, pivoted and fixed) - Design details for windows (openable, sliding, fixed, louvered) – Design details for Ventilators (top hung, pivoted and louvered) - Aluminium roofing (North lighting, glazing bar, roofing sheets, construction details including gutter details. Exercises of the above through case studies and drawings.

UNIT V **CONSTRUCTION TECHQUIES USING COMPOSITE MATERILS** **14 Hrs**

Brief study of Aluminium and steel Product with Glass, Wood and Concrete - its construction Details-Design details for Steel and Glass- Steel and Concrete, Steel and Wood- Design details for Glass and Aluminium for Wood- Exercises of the above through case studies.

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO 1: An Understanding of ferrous metals in terms of its properties, manufacture and their applications in architectural construction.

CO 2: The students are able to understand in detail the method of construction of various

buildingcomponents using steel and steel components.

CO 3: An Understanding of Non-ferrous metals in terms of its properties, manufacture and their applications in architectural construction.

CO 4: This also helps the student to understand the different construction practices adapted for thevarious components specific to the material in which it's made.

CO5: Students to understand that ferrous metals and Non-Ferrous metals are equally important inconstruction industry

TEXT BOOKS:

1. Dr. B.C. Punmia, "A Text book of Building Construction", Laxmi Publications Pvt. Ltd., New Delhi, 2004.
2. T.D Ahuja and G.S. Birdie, " Fundamentals of Building Construction", Dhanpat Rai Publishing Company Pvt. Ltd., New Delhi, 1996.
3. W.B. Mickay – Building construction Vol 1, 2 and 3 – Longmans, UK 1981.

REFERENCES:

1. Alan Blanc, "Architecture and Construction in Steel", E & FN Spon, London, 1993
2. Alan Blanc," Stairs, Steps and Ramps", Butterworth, Heinemann Ltd., 1999
3. W.B. McKay, "Building Construction" Vol. 1 and 2, Longmans, UK, 1981.
4. Barry, " Introduction to Construction of Buildings", Blackwell Publishing Ltd., Oxford, 2005
5. Alan J. Brookes, "Cladding of Buildings", E & FN Spon, London, 1998
6. R.Chudley – Building Construction Handbook – BLPD, London 1990.
7. S.C.Rangwals – Engineering materials – Charotar Publishing, Anand.
8. Francis D.K.Ching – Building Construction illustrated. VNR, 1975.
9. Gorenc, Tinyou Syam, : Steel Designer's handbook", CBS Publishers and Distributors, New Delhi, Bangalore ,2005
10. Don A.Waston, " Construction Materils and Porcess", McGraw Hill Co., 1972.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	An Understanding of ferrous metals in terms of its properties, manufacture and their applications in architectural construction.	3	3	3	3	2	-	2	3	-	3	-
CO 2	The students are able to understand in detail the method of construction of various building components using steel and steel components.	3	3	-	-	2	-	2	-	-	-	-
CO 3	An Understanding of Non-ferrous metals in terms of its properties, manufacture and their applications in architectural construction.	3	3	-	-	-	-	-	-	3	1	-
CO 4	This also helps the student to understand the different construction practices adapted for the various components specific to the material in which it's made.	-	-	-	3	-	-	-	-	-	-	2
CO 5	Students to understand that ferrous metals and Non-Ferrous metals are equally important in construction industry	1	-	-	3	-	-	-	3	-	-	2

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415ARP06	DESIGN STUDIO IV	L T P C 0 0 12 6

COURSE OBJECTIVES:

- To create a holistic understanding of the socio-cultural, geographic and economic aspects that shape the built environment as well as to expose the students towards the design of simple community oriented buildings.
- To make a comprehensive study of a rural settlement that is an exemplar of collective design evolved organically over a period of time.
- To expose the students on the methodology of conducting various surveys covering, physical, visual characteristics and demographic aspects.
- To understand 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.

1. DESIGN STUDIO - RURAL PROJECT **105 Hrs**

Problems related to rural precincts - visits to selected villages - surveys on visual, socioeconomic and environmental behavior studies – Physical & technical aspects of rural design elements & Planning methods - study existing conditions - analysis of survey data - preparation of report. Comprehensive analysis of rural settlement in a hierarchical manner. Preparation of design solution for housing & community facilities. Single level planning in small scale- presentation of report & design.

2. SUGGESTIVE TYPOLOGIES/ PROJECTS **75 Hrs**

Rural projects that involve studies and design at settlement and building level- noon meal centre, market, primary health centre; department store, higher secondary school, campus students centre, Co-operative societies, community centre etc.

TOTAL: 180 Hrs

COURSE OUTCOMES:

CO 1: Student's ability to understand the concept of community and settlement evolution and the built environment as influenced by Socio-economic, Cultural, Environmental and Technical factors.

CO 2: Ability to provide a sensitive approach to the design of the built environment taking intoaccount the above mentioned factors.

CO 3: Educated the student into the process of design in different context (Rural) by choosingrelevant topics of community or civic importance.

CO 4: Thrust was given on rural materials, construction techniques and design details.

CO 5: Students gained knowledge the physical, technical and visual characteristics of a settlements atmicro level.

TEXT BOOKS:

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

REFERENCES:

1. Richard P. Dober, "Campus Planning", Society for College and University Planning, 1996.
2. Kanvinde, "Campus design in India", American year Book, 1969
3. Kevin Lynch, "Site planning", MIT Press, Cambridge, 1984
4. Sam F. Miller, "Design Process: A Primer for Architectural and Interior Design", Van Nostrand Reinhold, 1995

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	An Understanding of ferrous metals in terms of its properties, manufacture and their applications in architectural construction.	3	3	3	3	3	-	-	-	3	1	-
CO 2	The students are able to understand in detail the method of construction of various building components using steel and steel components.	3	3	3	3	3	-	-	-	3	1	-
CO 3	An Understanding of Non-ferrous metals in terms of its properties, manufacture and their applications in architectural construction.	3	3	3	3	3	-	-	-	3	1	-
CO 4	This also helps the student to understand the different construction practices adapted for the various components specific to the material in which it's made.	3	3	3	3	3	-	-	-	-	-	2
CO 5	Students to understand that ferrous metals and Non-Ferrous metals are equally important in construction industry	3	3	3	3	3	-	-	-	-	-	2

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415ARE01 **ENERGY EFFICIENT ARCHITECTURE** **L T P C**
3 0 0 3

COURSE 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 study methodologies to incorporate solar passive heating system in buildings through select case studies with stress on materials and techniques.
- To study ways to incorporate solar passive cooling systems through select examples with stress on materials and techniques.
- To enable student to understand importance of site planning, vegetation types, water bodies as factors inspiring concepts of design.
- To make the students aware of the future trends in creating sustainable built environment.

UNIT I **CLIMATE AND SHELTER** **6 Hrs**

Climate responsive design features in Historic Perspective - Examples of traditional / vernacular architecture of various places in different climate zones.–Contemporary Trends in Energy Efficient Architecture.

UNIT II **SOLAR ENERGY AND BUILDINGS** **7 Hrs**

General principles and techniques – solar passive architecture. Methods of energy conservation techniques. Solar water heating system. Heat transfer and Thermal Performance of Walls and Roofs. Future Trends - Photo Voltaic Cells, Battery Technology, Thermal Energy Storage.

UNIT III **PASSIVE SOLAR HEATING** **10 Hrs**

General principles –Various methods of maximizing exposure to solar radiation in cold & temperature climate. Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, Roof radiation trap, Solarium etc. Isolated gain systems – Natural convective loop etc. Case studies on buildings designed with passive heating techniques.

UNIT IV **PASSIVE COOLING** **10 Hrs**

General principles – Various techniques of shading to reduce heat gain in tropical climate Evaporative cooling, Nocturnal radiation cooling, Passive Desiccant cooling, Induced ventilation, Earth sheltering, Earth Berming, Wind Towers, Earth Air tunnels, Curved Roofs & Air Vents, Insulation etc. Case studies on buildings designed with passive cooling techniques.

UNIT V **ENERGY EFFICIENT DESIGN CONCEPTS** **12 Hrs**

Design Considerations involving Site Conditions, Land form & orientation – Vegetation type & Pattern – Water Bodies – Open Space & Built form - Plan form &Elements – Roof form – Fenestration pattern & Configuration – Building envelope & finishes. Daylight Factor and Analysis.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: The students are exposed to alternative sources of energy and are exposed to passive designconsiderations

CO 2: An understanding on site design conditions for various climatic zones in creating sustainablebuilt environment. Also gained knowledge in passive heating techniques for various building.

CO 3: Understood the concepts of passive cooling techniques satisfying the demand of future needs.

CO 4: Exposed the students to various design concepts with model making.

CO 5: To understand the importance of Energy conservation in general and solar energy particularly and to incorporate energy efficient techniques in Planning, design and detailing of buildings.

TEXT BOOKS:

1. MiliMajunder, Teri – Energy – Efficient Bldg in India – Thomson Press , New Delhi – 2001
2. J.K Nayak&Others , Energy Systems Energy Group,- Isa Annal Of Passive Solar Architecture.
3. Manual on Solar Passive Architecture, IIT Mumbai and Mines New Delhi, 1999
4. Arvind Krishnan & Others, " Climate Responsive Architecture", A Design Handbook for
5. Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001
6. Majumdar M, "Energy-efficient Building in India", TERI Press, 2000.
7. 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
2. Sophia and Stefan Behling, Solpower, "The Evolution of Solar Architecture", Prestel, New York, 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
6. "Climatically Responsive Energy Efficient Architecture", PLEA/SPA, New Delhi 1995.
7. Ms.Sudha, N.K.Bansal and M.A.S.Malik, "Solar Passive Building", Pergamon press.
8. James D. Ritchie – Successful Alternate Energy Methods – Structures Publishing Co . Michigan 1980.
9. George Basid& Others – Energy Performance of Bldg – CRC Press, Florida 1984.
10. Ralph M .Lebens – Passive Solar Architecture in Europe – 2, Architecture Press, London 1983.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students are exposed to alternative sources of energy and are exposed to passive designconsiderations	3	3	-	-	-	-	-	-	-	1	2
CO 2	An understanding on site design conditions for various climatic zones in creating sustainable built environment. Also gained knowledge in	3	3	-	-	-	-	1	-	-	1	2

	passive heating techniques for various building.											
CO 3	Understood the concepts of passive cooling techniques satisfying the demand of future needs.	3	3	-	-	-	-	-	-	-	1	2
CO 4	Exposed the students to various design concepts with model making	3	3	-	-	-	-	-	-	-	1	2
CO 5	To understand the importance of Energy conservation in general and solar energy particularly and to incorporate energy efficient techniques in Planning, design and detailing of buildings.	3	3	-	-	-	-	-	-	-	1	2

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415ARE03 **ERGONOMICS IN BUILDING DESIGN** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To understand the principles of human factors and the relationship to environmental design.
- To understand issues of ergonomic design with built environment.
- To orient the student towards the criteria to be considered in the built environment for thephysically challenged individuals.
- To learn metrological analysis of the anthropometrics relationship to ergonomicenvironmental design.
- To enable the students in understanding the psychosocial aspects of ergonomic necessities indesign.

UNIT 1 INTRODUCTION TO HUMAN FUNCTION **8 Hrs**

Human being in the manmade world and importance of ergonomics, Gross human anatomy, Ergonomics for children and old people.

UNIT 2 ERGONOMICS AND DESIGN **12 Hrs**

Introduction to Anthropometrics – static and dynamic, Muscles and work physiology, Static and Dynamic work including maximum capacity. Anthropometric dimensions for designing interior spaces and products for children, men, women and elderly.

UNIT 3 INCLUSIVE DESIGN **10 Hrs**

Spatial Requirements for the physically handicapped – Ramp, toilets and corridor design-Design issues in the design of old age homes – Criteria to be considered in the Built environment when designing for the blind and physically challenged individuals and universal design principles.

UNIT 4 ENVIRONMENTAL ERGONOMICS **8 Hrs**

Simulation and Responses in various environmental conditions including, thermal, illumination, noise and vibration-Importance of ergonomic design in the built environment.

UNIT 5 ADVANCED ERGONOMICS **7 Hrs**

Ergonomics and its application - Workstation, Physical Environment and Materials Handling. Psycho social aspects of Design and Aesthetical incorporation of ergonomic necessities in design.

TOTAL 45 Hrs

COURSE OUTCOME:

CO 1: Understand the relevance of human factors and anthropometrics to environmental design.

CO 2: Explain the importance of ergonomic design in the built environment.

CO 3: Analyze anthropometric dimensions for designing interior spaces and products for children,men, women, elderly and physically challenged individuals.

CO 4: Demonstrate design analysis that follows the principles of human factors/ergonomics.

CO 5: This also helps the student to understand the ergonomic necessities in design.

TEXT BOOKS:

1. Sanders, M.M. & McCormick, E.J. (1993) Human Factors in Engineering & Design, 7th ed. McGrawHill, NY.
2. Human factors/ergonomics for building and construction Martin Helander

3. Body space: Anthropometry, Ergonomics and the Design of Work, 3rd edition, CRC. Ulijaszek, S. &Mascie-Taylor, N. (1994)
4. Anthropometry: The Individual and the Population (Cambridge Studies in Biological and Evolutionary Anthropology) Cambridge University Press.

REFERENCES:

1. Sanders, M.M. & McCormick, E.J. (1993) Human Factors in Engineering & Design, 7th ed. McGrawHill, NY.
2. NLS. Eligibility of Blind and Other Physically Handicapped Persons for Loan of Library Materials.
3. "Eligibility of Blind and Other Physically Handicapped Persons for Loan of Library Materials". *Loc.gov. 2013-06-28*. Retrieved 2013-07-28.
4. Panero, J. &Zelnick, M. (1979). Human Dimension and Interior Space:
5. A Source Book of Design Reference Standards, Watson-Guptill. Salvendy, G. (2006).
6. Hand book of Human Factors and ergonomics, 3rd edition, Wiley.Lang, J. (1987). Lang, J. (1987).
7. Creating architectural theory: The role of the behavioral sciences in environmental design, NY: Van Nostrand Reinhold. Pheasant, S. &Haslegrave, C. (2005)
8. Alvin R. Tilley (2001). The Measure of Man and Woman: Human Factors in Design, Henry Dreyfuss Associates Zar, J. (1999).
9. Biostatistical analysis, 4th edition, NJ: prentice Hall. Gordon, C. (1990). 1988

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Understand the relevance of human factors and anthropometrics to environmental design.	3	3	-	3	-	-	-	-	-	2	-
CO 2	Explain the importance of ergonomic design in the built environment	3	3	-	2	-	-	-	-	-	-	2
CO 3	Analyze anthropometric dimensions for designing interior spaces and products for children, men, women, elderly and physically challenged individuals.	2	-	-	2	-	-	-	-	2	-	-
CO 4	Demonstrate design analysis that follows the principles of human factors/ergonomics	-	-	-	2	-	-	-	-	2	-	-
CO 5	This also helps the student to understand the ergonomic necessities in design.	-	2	-	-	2	-	-	-	-	2	2

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515ART01 **ANALYSIS AND DESIGN OF STRUCTURES – II** **L T P C**
2 1 0 3

COURSE OBJECTIVES:

- Be familiar with the knowledge of various design methods for concrete structures and also know about partial safety factor, stress strain relationship of concrete
- Be acquainted with the knowledge of limit state design of beam including singly reinforced, doubly reinforced and flanged beam
- To gain knowledge of limit states design of RCC slabs using IS codes.
- To strengthen student's knowledge about reinforced cement concrete and its applications in buildings. To equip students about the methods of designing various structural members using reinforced cement concrete.

UNIT I **PROPERTIES OF CONCRETE AND VARIOUS DESIGN METHODS** **5 Hrs**

Structural properties of concrete - Grades and Strength of Concrete - durability -Concept of Working stress method, Ultimate Load Method and Limit State Method – Advantages of Limit State Method over other methods -stress strain relationships.

UNIT II **LIMIT STATE DESIGN - INTRODUCTION** **6 Hrs**

Various limit stages - characteristic load and characteristic strength of materials - partial safety factor – stress -strain relationship of steel and concrete - safety and serviceability requirements.

UNIT III **LIMIT STATE DESIGN OF BEAMS** **10 Hrs**

Analysis and Design of rectangular sections for bending - singly reinforced, doubly reinforced, flanged sections and continuous beams.

Exercise on singly and doubly reinforced beam with drawings.

UNIT IV **LIMIT STATE DESIGN OF SLABS** **12 Hrs**

Design of one-way two-way and continuous slabs using IS Code co-efficient for various edge conditions. Introduction to shells and folded plates and classification of shells.

Exercise on One-way and Two- way slab with drawings.

UNIT V **CIRCULAR SLABS AND FLAT SLABS** **12 Hrs**

Design of RCC Circular slabs - simply supported and fixed slabs with uniformly distributed loads. Design principles of flat slabs - code provisions – Simple design problems.

Exercise on flat slabs with drawings.

TOTAL: 45 Hrs

COURSE OUTCOMES:

The students will able to

CO1: Gain basic knowledge about concrete and its applications with case studies.
CO2: Understanding the various methods in designing the members such as beams and slabs.
CO3: Apply the limit state design methods to design RCC beams and slabs and present the same.
CO4: Design of one way & two way slab.
CO5: Present drawings and case study on concrete beams and slabs through photography documentation, video presentation and modeling.

TEXT BOOKS:

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. Vazirani and Ratwani, Concrete Structures, Khanna Publishers, New Delhi, 1969.

REFERENCES:

1. Dr. B.C. Punmia, "Reinforced Concrete Structures", Vol, 1 & 2 Laxmi publication, Delhi, 2004.
2. IS 456 "Indian Standard, Plain and Reinforced Concrete, Code of Practice, Bureau of Indian Standards, 2000.
3. S.Unnikrishnan Pillai and Devados Menon, "Reinforced Concrete Design" – Tata McGraw

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Gain basic knowledge about concrete and its applications with case studies.	2	1	3	-	-	-	-	2	3	-	-
CO 2	Understanding the various methods in designing the members such as beams and slabs.	2	1	3	-	-	-	-	2	3	-	-
CO 3	Apply the limit state design methods to design RCC beams and slabs and present the same.	2	1	3	-	-	-	-	2	3	-	-
CO 4	Design of one way & two way slab.	2	1	3	-	-	-	-	2	3	-	-
CO 5	Present drawings and case study on concrete beams and slabs through photography documentation, video presentation and modeling.	2	1	3	-	-	-	-	2	3	-	-

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515ART03 **INTERIOR DESIGN PRINCIPLES** **L T P C**
2 0 2 3

COURSE OBJECTIVES:

- To introduce the process of interior design with an understanding of principles and elements and how these could enhance themes and concepts.
- To make the student aware of the evolution in the historical context and as to how arts and crafts influence decoration and detail.
- To enable student understand the importance of floors, ceilings, walls and other elements of buildings to contribute to aesthetic and physiological effect.
- To introduce the other components like lighting fixtures, objects of art, hard and soft landscape elements for good articulation of space.
- To make students aware about the role of furniture's, types, as reflectors of life style and trends in the value systems of people.

UNIT I **INTRODUCTION TO INTERIOR DESIGN & HISTORY OF INTERIOR DESIGN** **10 Hrs**

Definition of interior design - 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. Brief study of the history of interior design through the ages relating to historical context, design movements, folk arts and crafts, vernacular design in India with reference to interior design and decoration.

UNIT II **ELEMENTS OF INTERIOR DESIGN - FURNITURE DESIGN** **15 Hrs**

Study of the relationship between furniture and spaces, human movements & furniture design as related to human comfort, Function, materials and methods of construction changing trends and lifestyles, innovations and design ideas. Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems.

Exercises on live scale furniture design.

UNIT III **ELEMENTS OF INTERIOR DESIGN - ENCLOSING ELEMENTS** **20 Hrs**

Introduction to various elements in interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements. Various methods of treatment involving the uses of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects - design projects.

Exercises on Hotel room interiors, Music shop, Restaurant, Children's bedroom and show rooms.

UNIT IV **ELEMENTS OF INTERIOR DESIGN – LIGHTING & ACCESSORIES** **15 Hrs**

Study of interior lighting, different types of lighting their effects types of lighting fixtures, other elements of interiors like accessories used for enhancement of interiors, paintings.

Exercises on Banquet halls, cinema or exhibition halls.

UNIT V **INTERIOR LANDSCAPING** **15 Hrs**

Interior landscaping, elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

Exercises on interior & exterior spaces, terrace gardens and courtyards.

TOTAL: 60 Hrs

COURSE OUTCOMES:

The students will able to

CO1: Case study presentations to understand the vocabulary of interior design in Indian context.

CO2: Present live scale furniture design models for various spaces.
CO3: Understand the various components in interior space and present the same through drawings.
CO4: Analysis of interior lighting through case study or video presentations.
CO5: Provide interior landscape design with necessary details and drawings for terrace garden courtyards etc.

TEXT BOOKS:

1. Francis D.K.Ching, "Interior Design Illustrated", V.N.R. Pub. NY 1987
2. Joseph DeChiara, Julius Panero, Martin Zelnik, "Time Saver's Standards for Interior Design", McGraw-Hill Professional 2001
3. John F.Pile, "Interior Design", John Wiley and Sons 2004
4. Dr.SaranyaDoshi, Editor, "The Impulse to adorn - Studies in traditional Indian Architecture", Marg Publications 1982
5. Steport - De - Van Kness, Logan and Szebely, "Introduction to Interior Design", Macmillan Publishing Co NY 1980.
6. Julius Penero and Martin Zelnik, Human Dimensions and Interior space Whitney Library of Design, NY 1979.

REFERENCES

1. Helen Marie Evans, "An Invitation to design", Macmillan Pub Co 1982
2. Julius Penero and Martin Zelnik, " Human Dimensions and Interior space", Whitney Library of Design NY 1979
3. " Inca-Interior Design Register", Inca Publications, Chennai 1989
4. Kathryn B.Hiesinger and George H.Marcus, Landmarks of twentieth Century Design; Abbey Ville Press 1993
5. Susanne slesin and stafford cliff, indian style, clarkson n. Potter, new york 1990.
6. SyanneSlesin and Stafford Ceiff- Indian Style, Clarkson N.Potter, New York, 1990.
7. Dorothy, S-D., Kness, D. M., Logan, K. C. and Laura, S. (1983). Introduction to Interior Design.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Case study presentations to understand the vocabulary of interior design in Indian context	3	2	-	-	3	-	-	3	2	2	3
CO 2	Present live scale furniture design models for various spaces.	3	3	-	-	3	-	-	2	-	2	3
CO 3	Understand the various components in interior space and present the same through drawings.	3	2	3	1	-	-	-	3	2	3	3
CO 4	Analysis of interior lighting through case study or video presentations.	3	2	3	-	-	-	-	3	2	3	3
CO 5	Provide interior landscape design with necessary details and drawings for terrace garden courtyards etc.	3	3	3	-	-	-	-	3	2	3	3

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515ART04	BUILDING SERVICES II	L T P C 2 0 2 3

COURSE OBJECTIVES:

- To give detailed input on low and high voltage supplies, precautionary methods required for safety, electrical circuit supply and distribution and knowledge on Sub-station required for public buildings and campuses.
- To enable students understand the importance of lighting in buildings for visual appreciation, factors and laws involved in illumination.
- To give additional knowledge on sources of light, its classification and intensities required for various types of gad jets, their advantages and disadvantages in usage.
- To understand the basic fundamental properties of acoustics & electrical services.
- To distinguish between sounds and noise its types, transmission, control its insulation and remedial measure in buildings.
- To understand the corrective acoustic measures required to floors, walls, ceilings, windows and doors for effective articulation.

UNIT I ELECTRICAL SYSTEMS AND LAYOUTS IN BUILDING **9 Hrs**

Basics of electricity - Single/Three phase supply - Protective devices in electrical installations - Earthing for safety - Types of earthing - ISI specifications. Types of wires, wiring systems and their choice - Main and distribution boards – transformers, sub stations and switch gears. Electronic and Communication systems -Communication and data systems- communication spaces, pathways, cabling systems, voice and data, communication, Electronic security systems, computer labs/server rooms.

Exercises: Electrical layout of a simple residence, school, commercial buildings with concealed and unconcealed wiring with necessary detail and drawings.

UNIT II FUNDAMENTALS OF LIGHTING **9 Hrs**

Principles of light – Electromagnetic radiation, waves, nature of vision, measurement of lighting. Principles of illumination: definitions, Visual tasks, Factors affecting visual tasks Units of light, definitions of flux, solid angle, luminous intensity –utilization factor – depreciation factor- MSCP –MHCP, brightness, glare.

UNIT III ILLUMINTAION & LIGHTING DESIGN OF BUILDINGS **9 Hrs**

Electric light sources: characteristics and application of different types of lamps, Methods of mounting and lighting control Luminaries classification/ - Lumen method for design –Room reflectance/ Glare – manufacturer's data on luminaries / luminaries cost Artificial light sources, spectral energy distribution, Luminous efficiency- Lighting for Office, Schools, Libraries, Residential, Hospital, Parking, Outdoor. Elementary ideas of special features required and minimum level of illumination for the physically handicapped and elderly in building types - Illumination level (NBC) nominal calculations of lighting for small application.

UNIT IV FUNDAMENTALS OF ARCHITECTURAL ACOUSTICS **9 Hrs**

Fundamentals – Sound - classification of sound measure of sound decibel scale-loudness-intensity-problems-Weber-Fechner law-wave length-frequency-period. frequency, intensity, wave length, Generation and propagation of high frequency and low frequency sound waves, transmission; reception of sound. Reverberation time – Sabine's formula for reverberation time (rate of growth and decay) – absorption coefficient- determination of absorption co-efficient problems and its calculation and problems. Behavior of sounds in enclosed space.

UNIT V ACOUSTICS OF ARCHITECTURAL SPACES — 9 Hrs

Factors affecting acoustics of building (optimum reverberation, loudness, focusing, echo, echelon effects, resonance and noise) and their remedies- principles to be observed in the acoustical design of an auditorium. Effects of geometry and shape; site selection, acoustical properties of building materials, absorption coefficient; choice of materials and treatment for interior surfaces. Acoustics and basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, schools, residences, office buildings including constructional measures and sound reinforcement systems for building types – case studies.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: Electrical Drawing with the basics of Electricity and wiring system to be submitted for a residential building.

CO2: Catalogues on various types of lights to be collected and displayed.

CO3: Prepare, Design and estimate the electrical load required for any building.

CO4: Apply the illumination required for different occupancies and tasks.

CO5: Case study visit to recording to understand the spatial design characteristics of studios and materials used.

TEXT BOOKS:

1. Philips, "Lighting in Architectural Design", McGraw Hill. New York, 1964.
2. R. G. Hopkenson & J. D. Kay, "The lighting of Buildings", Faber & Faber, London, 1969.
3. E.P.Ambrose, Electric Heating, John Weley & Sons Inc., New York, 1968
4. R.G.Hopkenson & J.D.Kay, The lighting of Buildings, Faber & Faber, London, 1969

REFERENCES:

1. Handbook of building Engineers in metric systems, NBO(India), 1968
2. National Building Code of India, 2005 (NBC 2005)
3. Electrical Engineering by Anw
4. ari.
5. Electrical Technology by VH Cotton
6. Electrical wiring, Estimation and Costing, by L Uppal.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Electrical Drawing with the basics of Electricity and wiring system to be submitted for a residential building.	3	2	-	-	3	-	-	3	2	2	3
CO 2	Catalogues on various types of lights to be collected and displayed	3	3	-	-	3	-	-	2	-	2	3
CO 3	Prepare, Design and estimate the electrical load required for any building	3	3	3	2	1	2	-	-	2	1	1
CO 4	Apply the illumination required for different occupancies and tasks	3	2	1	-	-	-	-	-	3	2	1
CO 5	Case study visit to recording to understand the spatial design characteristics of studios and materials used.	2	3	3	2	1	-	2	-	2	-	1

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515ART05 **MATERIALS & CONSTRUCTION V** **L T P C**
1 0 4 3

COURSE OBJECTIVES:

- To understand the various materials and membranes for damp and water – proofing their method of application depending on the context like residential building and swimming pool, through detail drawing.
- To study the heat transfer into buildings by various U – value materials, their properties, uses and methods of application in floors, walls and roofs, through detail drawing.
- To understand the various floor and wall finishing materials, their properties, method of laying and making them to adopt for barrier free environment, through detail drawing.
- To understand the properties, uses and applications of various paints, enamels, emulsions, varnishes and their varieties for contextual application in buildings.
- To educate students on protective, preventive and corrective actions, to be taken in a building with regards to various materials, details, and stages in construction, for comprehensive understanding of practices to cover damp and water proofing. Types of insulation, covering, paints and exterior cladding.

UNIT I DAMP AND WATER PROOFING **20 Hrs**

Damp proofing- Hot application and cold application, Properties of Materials for DPC, Classification of material- Flexible material- bitumen felts, fiber/glass fiber based, plastic DPC Membrane (polythene sheet), Semi rigid materials- mastic asphalts, Rigid materials- first class bricks, stones, slates, cement concrete, Grout materials - cement slurry and acrylic based chemical or polymers, Selection of Materials for Damp Proof Course in Buildings- Hot bitumen, Mastic asphalt, Bituminous felts, Metal sheets, Combination of sheets and felts, Stone, Bricks, Mortar, Cement concrete and Plastic sheets.

Water Proofing- Cementitious Waterproofing, Liquid Waterproofing Membrane, Bituminous Membrane, Bituminous Coating, Polyurethane Liquid Membrane. Application of the above under various situations- case study and exercise involving in the above.

Exercise on Damp-Proofing In Residential Building, Swimming Pool.

UNIT II THERMAL INSULATION **15 Hrs**

Heat Transfer- conduction, convection, and radiation and Heat gain by building and materials methods of heat insulation or thermal insulation- Roofs, exposed walls and exposed windows, doors & ventilators etc. Insulation Materials & Systems- U-value for common materials- Fibrous /Mineral Insulation Materials- Rock wool ,Glass wool and Slag wool- **Rigid Insulations**- Extruded Polystyrene Foam, Polyurethane Foam ,Polyisocyanurate Foam and Expanded Polystyrene Foam, Application Areas for Insulation- Roofs, wall insulation (Internal and External).

Exercise on Commercial building and Cold storage.

UNIT III ACOUSTIC INSULATION **15 Hrs**

Acoustic insulation Materials- Types of Acoustic Insulation- **Gypsum-** Properties and uses, Plaster of Paris and hydride Gypsum. **Blankets and Batts**- fiberglass and mineral fiber.

Gypsum Panels- Ecophon, Metal Ceiling Tiles, **Acoustic Panels**- Acoustic Fabric Wrapped Panels, Acoustic Panel Room, Cotton Acoustic Panels, Foam Acoustic Panels, Art Acoustic Panels and indoor and outdoor acoustic panels-straw panels, Foam egg-crate panels.

Viscoelastic Products- plywood, drywall or cement board- Brief case study on uses in building industry of the above.

Exercise on Recording Studios, performance halls, conference space etc.

UNIT IV FLOOR AND WALL COVERING **10 Hrs**

Floor Covering: Flooring- Softwood, Hardwood- Resilient flooring- linoleum, asphalt, vinyl (composition and solid), rubber, cork tiles- Properties, uses and laying methods.

Wall Covering: Porcelain, enameled metal. Wood veneer, vinyl, plastic surfaced paneling- Properties, uses and laying methods.

Wall and Floor tiles- Ceramic Glazed, Mosaic, Quarry and Cement tiles- Properties, uses and laying methods. Detailing for physically handicapped. Brief case study on uses in building industry of the above.

Exercise on Cold storage, Class Room, performance halls, Gym space, Hospital and interior of restaurant and office space, etc.,

UNIT V EXTERIOR FINISHES **15 Hrs**

Exterior Finishes-Types of exteriors finishes like painting, Cladding, Structural glazing and contemporary surface treatment- different types of composite materials with their properties and uses in building.

Exercise on Shopping complex, Car showroom, Commercial complex and interior spaces of restaurant and office space etc.

TOTAL: 75 Hrs

COURSE OUTCOMES:

CO1: The students understood various components of buildings in terms of damp proofing and waterproofing through case study of swimming pool and collections of materials and catalogue.

CO2: The construction techniques of thermal insulation in a cold storage to be presented as a report.

CO3: Worked on the different insulation and acoustics materials.

CO4: Analyze and present the different construction practices adapted for the various components specific to the material and finishes in the floor and wall coverings.

CO5: The students are asked to the documentation through materials, catalogue, photograph and video presentation the various exterior finishes of paints, cladding, structural glazing and their contextual application in buildings.

TEXT BOOKS:

1. S.C.Rangwala, Building Construction (Sixteenth Edition) Charotar Publishing House, Anand, India, 1997.
2. Basic Civil Engineering by Satheesh Gopi

REFERENCES:

1. Jack M.Launders, Construction Materials, Methods, careers pub, J.Holland, Illinois Wileox Co., Inc. 1983.
2. Arthur R.Llons, Materials for architects and builders - An introduction, Holder Headline group, Great Britain, 1997.
3. Don.A.Watson, Construction Materials and Processes, McGraw-Hill Book Co., 1972
4. W.B. McKay, Building construction, Longman, U.K.
5. Francis. D. K. Ching – A Visual Dictionary of Architecture – Van Nostrand Reinhold – 1997.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students understood various components of buildings in terms of damp	3	3	3	-	3	-	-	2	3	2	3

	proofing and waterproofing through case study of swimming pool and collections of materials and catalogue.											
CO 2	The construction techniques of thermal insulation in a cold storage to be presented as a report.	2	3	3	-	3	-	-	-	-	3	2
CO 3	Worked on the different insulation and acoustics materials.	1	3	2	-	-	-	-	2	3	2	-
CO 4	Analyze and present the different construction practices adapted for the various components specific to the material and finishes in the floor and wall coverings.	2	3	2	-	2	3	-	2	3	2	-
CO 5	The students are asked to the documentation through materials, catalogue, photograph and video presentation the various exterior finishes of paints, cladding, structural glazing and their contextual application in buildings.	2	3	3	2	1	-	2	-	2	-	1

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515ARP06 **DESIGN STUDIO V** **L T P C**
0 0 12 6

COURSE OBJECTIVES:

- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially and culturally sensitive manner, taking into account aspects such as user perception, crowd behaviour, and large scale movement of people and identity of buildings.
- 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.
- To emphasize on the importance of understanding the relationship between open space and built form, built form to build form and site planning principles involving landscaping circulation network and parking.
- To explore computer aided presentation techniques involving 2D and 3D drawings and models as required.

CONTENT:

Scale and Complexity: Buildings and small complexes that address the social and cultural needs of contemporary urban life (residential. Commercial, institutional) with a thrust on passive and active energy. experiential qualities; multi bayed, multiple storied and circulation intensive; technology, structural clarity and services in terms of lighting, ventilation, movement, 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. Application and use of relevant building bye-laws and provisions of National Building Code

Areas of concern / focus

- behavioral aspects and user satisfaction
- socio-cultural aspects
- designing for the differently abled
- Building byelaws and rules
- Appropriate materials and construction techniques
- Climatic design

Typology /project: Housing Projects- detached, semi-detached, row housing, cluster housing, apartment; housing and facilities for other user groups- Old age Home, orphanage, working women's hostel, home for physically and mentally challenged; Museum/ Art centre, Educational campus, R & D center, Shopping centers (Commercial), Health centers, Nursing homes (institutional) Etc.

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

TOTAL: 240 Hrs

COURSE OUTCOMES:

CO1: Ability to provide a sensitive approach to the design of the built environment taking into the social and cultural needs of contemporary urban life.

CO2: The various components and aspects associated with the urban environment in terms of physical infrastructure, socio cultural aspects, gender issues etc. are looked at ways to address them through their designs.

CO3: Mapping and diagramming techniques were detailed in the design process to help them explore the design.

CO4: Student's ability to understand the DCR and its applications, an orientation to Computer Aided Drafting.

CO5: Explored on design of buildings addressing the socio – cultural & economic needs of contemporary urban society.

TEXT BOOKS:

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 Neuferts Architects Data, Blackwell 2002
5. Ramsey et al, "Architectural Graphic Standards", Wiley, 2000.

REFERENCES:

1. Richard P. Dober, Campus Planning
2. Kanvinde, Campus Planning in India
3. Kevin Lynch, Site planning, MIT Press, Cambridge, 1967
4. Sam F. Miller, Design Process: A Primer for Architectural and Interior Design, Van Nostrand Reinhold, 1995
5. Edward D.Mills, Planning, 4 volumes, Newnes, Butterworths, London, 1976. 2.P&D Act 1995.
6. E and O.E. Planning. Lliffee Books Ltd., London, 1973.
7. National Building Code and Bureau of Indian standard publications.
8. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. - 2002
9. De Chiara Callender, Time Saver Standard for Building Types, McGraw-Hills Co., 1973.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Ability to provide a sensitive approach to the design of the built environment taking into the social and cultural needs of contemporary urban life.	3	3	3	2	3	-	-	2	3	3	2
CO 2	The various components and aspects associated with the urban environment in terms of physical infrastructure, socio cultural aspects, gender issues etc. are looked at ways to address them through their designs.	2	3	3	-	3	3	2	1	3	-	3
CO 3	Mapping and diagramming techniques were detailed in the design process to help them explore the design.	3	3	3	-	-	3	-	2	2	3	-
CO 4	Student's ability to understand the DCR and its	2	3	3	-	2	3	-	2	3	2	-

	applications, an orientation to Computer Aided Drafting.											
CO 5	Explored on design of buildings addressing the socio – cultural & economic needs of contemporary urban society.	3	3	3	2	3	-	2	-	2	-	1

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515ARE01 **WASTE MANAGEMENT AND RECYCLING** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To create awareness on categorization of waste and intelligent management of waste with due concern in protecting the environment.
- To know about the various generation factor and its cradle to grave.
- To encourage the use of by products from the industrial waste as alternative building material and thereby reducing its impact on environment.
- To ensure sustainability through recycling the waste products/materials.
- To enable the students understand about the environmental management and energy conservation.

UNIT I INTRODUCTION **6 Hrs**

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

UNIT II WASTE AND BUILT ENVIRONMENTAL **12 Hrs**

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

UNIT III ALTERNATIVE BUILDING MATERIALS **10 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 RECYCING OF WASTES **10 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 **7Hrs**

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: 45 Hrs

COURSE OUTCOMES:

The student should be able to

CO1: Understood the traditional practices of waste management factors in various buildings.
CO2: Gained knowledge on the waste generation factor and cradle to cradle and cradle to grave.
CO3: Explore new alternative energy resources and building materials for healthy environments through literature studies.
CO4: Ensure a sustainable design approach through waste recycling methods.
CO5: Understand the significances of sustainable development and the need to enforce the environmental acts.

TEXT BOOKS:

1. Tchobanoglous, G. &Kreith, F. (2002).Handbook of Solid Waste Management, 2nd ed. McGraw-Hill, New York.
2. Howard S. Peavy, Donald R. Rowe and George Tchobanoglous, "Environmental Engineering", McGraw - Hill Co., 1988.
3. Environmental Science- Towards a sustainable future by Richard T. Wright, PHI Learning, New Delhi 2008.
4. Textbook of Environmental Science & Technology by M.Anji Reddy, BS Publications, 2010.
5. Waste water engineering, treatment and reuse by Metcalf & Eddy, fifth edition, Tata Mcgraw Hill.

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1. Ravindrarajah, R.S, Tam. T.C. Properties of concrete made with crushed concrete a coarse aggregate, - Magazine of concrete Research, Vol-37, 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.
5. Standard handbook of Hazardous waste treatment and disposal by Harry M. Freeman, McGraw Hill 1997

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Understood the traditional practices of waste management factors in various buildings.	3	2	2	2	3	-	-	2	3	3	2
CO 2	Gained knowledge on the waste generation factor and cradle to cradle and cradle to grave.	2	3	3	-	2	-	2	1	3	-	-
CO 3	Explore new alternative energy resources and building materials for healthy environments through literature studies.	2	-	3	-	-	-	-	2	3	3	-
CO 4	Ensure a sustainable design approach through waste recycling methods	1	-	3	3	1	-	-	2	3	2	-
CO 5	Understand the significances of sustainable development and the need to enforce the environmental acts.	2	3	3	2	1	-	2	-	3	-	1

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515ARE02 **STRUCTURE AND ARCHITECTURE** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

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

UNIT I HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA 9 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 9 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 8 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 Fosters/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 10 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: 45 Hrs

COURSE OUTCOMES:

CO1: The structural design in the pre-industrial and post-industrial era is presented with detailed drawings and sketches.
CO2: Literature review and presentations of the world renowned buildings as case examples.
CO3: A critique of any one case example of Architects works mentioned above to be discussed.
CO4: It will encourage the student to exercise judgment in areas of structure, form and process.
CO5: A seminar presentation including the structural expression, architectural form and building services to be presented in detail with case examples.

TEXT BOOKS:

1. Greene King Draught Beer Dept and Schlumberger Cambridge Research Centre, UK by Michael Hopkins
2. Design Center, Linz, Austria and Two Family House in Pullach Thomas Herzog
3. King Abdul Aziz International Airport, Haj Terminal by SOM

REFERENCES:

1. "Paper Arch" and Japan Pavilion at Expo 2000 in Hannover by Shigeru Ban
2. Pavilion of the Future, Expo 92, Seville by Martorell, Bohigas & Mackay (MBM)
3. Daring Harbour Expo Center, Sydney Australia by P. COX
4. Olympic Archery Building by Enric Miralle & Carme Pinos
5. Eagle Rock House by Ian Ritchie
6. Le Grande Arche de La Defense by J O Spreckelsen

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The structural design in the pre-industrial and post-industrial era is presented with detailed drawings and sketches.	3	3	3	2	2	-	-	3	2	3	-
CO 2	Literature review and presentations of the world renowned buildings as case examples	2	1	-	-	-	1	-	2	3	3	1
CO 3	A critique of any one case example of Architects works mentioned above to be discussed	1	2	2	-	-	-	-	3	2	3	1
CO 4	It will encourage the student to exercise judgment in areas of structure, form and process.	3	3	-	2	1	-	1	2	-	2	3
CO 5	A seminar presentation including the structural expression, architectural form and building services to be presented in detail with case examples.	3	1	2	2	1	-	2	-	3	-	1

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615ART01 **ANALYSIS & DESIGN OF STRUCTURES – III** **L T P C**
2 1 0 3

COURSE OBJECTIVES:

- To understand the design and detailing of short RC columns by limit state design.
- To understand the design of doglegged staircase
- To understand design of isolated column footing and combined footing.
- To enable students learn the concepts and design of retaining wall
- To expose the student to grasp the idea about prestressed concrete

UNIT I LIMIT STATE DESIGN OF RCC COLUMNS **8 Hrs**

Code provisions - Design of axially loaded short and long columns of rectangular and circular sections - ties and spiral reinforcements.

UNIT II LIMIT STATE DESIGN OF STAIRCASE AND BRICK MASONRY **10 Hrs**

Types of staircases - Design of doglegged staircase. Analysis and Design of brick masonry, load bearing walls -codal requirements.

UNIT III LIMIT STATE DESIGN OF FOUNDATION **10 Hrs**

Types of foundations - Isolated pad footings - combined footings for simple design problems. Design principles for raft and pile foundation (No Design calculations).

UNIT IV RETAINING WALL **12 Hrs**

Retaining wall – Introduction, types and modes of failure of retaining wall-Design of Cantilever Retaining wall

UNIT V PRESTRESSED CONCRETE **5 Hrs**

Principles of pre-stressing, methods of pre-stressing, advantages and disadvantages

NOTE: Reference to IS codes and tables be permitted in the examination.

TOTAL: 45 Hrs

COURSE OUTCOMES:

At the end of day the students will be able to understand and

CO1: Gain basic knowledge about RCC column and its applications with case studies.
CO2: Design of dog legged staircase.
CO3: Design of isolated column footing and combined footing.
CO4: The concepts and design of cantilever retaining wall.
CO5: Principles and methods of prestressed concrete.

TEXT BOOKS:

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. Vazirani and Ratwani, Concrete Structures, Khanna Publishers, New Delhi, 1969.

REFERENCES:

1. Dr. B.C. Punmia, "Reinforced Concrete Structures", Vol, 1 & 2 Laxmipublication, Delhi, 2004.

2. IS 456 "Indian Standard, Plain and Reinforced Concrete, Code of Practice, Bureau of Indian Standards, 2000.
3. S.UnnikrishnanPillai and DevadosMenon, "Reinforced Concrete Design" – Tata McGraw
4. IS Code of practice for Pre stressed concrete, IS: 1343 – 1980, Govt Publications.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	Gain basic knowledge about RCC column and its applications with case studies	3	2	3	-	-	-	2	3	-	3	-
CO 2	Design of dog legged staircase	3	2	3	-	-	-	2	3	-	-	-
CO 3	Design of isolated column footing and combined footing.	3	2	3	-	-	-	2	3	3	1	-
CO 4	The concepts and design of cantilever retaining wall.	3	2	3	-	-	-	2	3	-	-	2
CO 5	Principles and methods of pre-stressed concrete.	3	2	3	-	-	-	2	3	-	-	2

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615ART03	BUILDING SERVICES III	L T P C 2 0 2 3

COURSE OBJECTIVES:

- To inform students on basic knowledge on thermodynamics principles and air conditioning components.
- To inform students about the system involved behind the mechanical ventilation in building.
- To enable students to understand the various types of air-conditioning systems available and their applications and choice based on the typology of building and loads.
- To inform students on the cause of fire, need for protection, standards and norms involved, various considerations in planning and making it barrier free.
- To provide knowledge to students on vertical transportation systems in buildings and the design of service core.

UNIT I BASIC REFRIGERATION PRINCIPLES AND AIR-CONDITIONING **15 Hrs**

Thermodynamics – Transfer of Heat - Vapor compression cycle - compressors - evaporators' Refrigerant control devices - Air handling units - Cooling towers. Air conditioning systems for various types of buildings (small buildings and large building) calculation of air-conditioning loads – Chilled water plant – All Air systems, all water system –equipment of spaces and size for the chiller plant, cooling tower, Fan room, circulation pumps and pipes, Air-distribution systems: Ducts and duct systems, Air outlets. Air-conditioning methods and equipment: window units, split units and central Air-conditioning systems. Location of air-conditioning equipment in buildings

UNIT II MECHANICAL VENTILATION **9 Hrs**

Mechanical/Artificial Ventilation – Need for mechanical ventilation in buildings. Rate of ventilation for different occupancies. Methods and equipment employed for mechanical ventilation in buildings.

UNIT III AIR-CONDITIONING – DESIGN ISSUES AND HORIZONTAL DISTRIBUTION OF SYSTEMS **12 Hrs**

Selection – Energy Efficient systems – Choice for small and large buildings – Horizontal distribution of services for large buildings – Grouped horizontal distribution of mechanical services. NBC 2005 and BIS. Architectural requirement of various equipment. Residential and commercial air-conditioning, energy conservation techniques.

Exercises: Calculation of air – conditioning load for various building types.

UNIT IV FIRE SAFETY – DESIGN AND INSTALLTIONS **12 Hrs**

Causes of fire in building and how it spreads, fire load, fire hazards, smoke detection, alarms, extinguishers and grading of structural elements due to fire as per NBC. Classification of building types and fire safety design principles and standards as per NBC. Brief description of characteristics of combustible and non-combustible materials in case of fire. General guidelines for egress design for multistory building. Rules for fire protection and firefighting requirements in different building typologies - prevention, evacuation strategies and suppression measures. Exercise on drawing layout for fire safety systems in building type.

UNIT V VERTICAL TRANSPORTATION SYSTEMS IN BUILDING **12Hrs**

Elevators, escalators, conveyors, travellators, dumb waiters – types and applications – round trip time, design of lift lobby and vertical transportation core. Latest technologies in vertical transport system and integration of lifts and escalators with building automation systems. Location and

arrangement in buildings. Space requirement, serving floors, grouping, size, shape of passenger car and door arrangement.
Exercises: Case study visit to commercial complexes, hospitals, apartments and offices.

TOTAL: 60 Hrs

COURSE OUTCOMES:

CO1: The students are exposed to various air conditioning systems and their applications.
CO2: They are also exposed to various design issues in the distribution systems.
CO3: An understanding of fire safety, firefighting, fire prevention and installations in buildings.
CO4: A detail understanding of design guidelines of vertical transportation system in current trends.
CO5: Exposed to students, specialized service in buildings like air-conditioning, its principles, components, applications, safety measures, fire-safety in buildings, fire resistant materials, and devices for safety detection of fire, gadgets involved, precautionary measures, and integration of these in architectural design.

TEXT BOOKS:

1. William H.Severns and Julian R Fellows, "Air conditioning and Refrigeration", John Wiley and Sons, London, 1988
2. "Fire Safety: National Building Code of India 1983" published by Bureau of Indian Standards.
3. Dr. V. Narasimhan, "An introduction to building physics", Kabir Printing works, Chennai-5, 1974.
4. David Egan, "Concepts in Architectural Acoustics", 1972.
5. National Building Code of India, 2005 (NBC 2005).
6. ISHRAE Handbook for Refrigeration 2015.

REFERENCES:

1. A.F.C. Sherratt, "Air conditioning and Energy conservation", The Architectural Press, London, 1980
2. Andrew H Buchanan, "Design for fire safety", First edition John Wiley & Sons Ltd., New York., 2001
3. Heating ventilation and Air conditioning – Swenson S. Don, Amer Technical Pub.
4. ISHRAE: All about AHU's – Air Handling Units.
5. CIBSE Guide D: Transportation Systems in Buildings (2010).

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students are exposed to various air conditioning systems and their applications.	2	3	-	3	1	-	-	3	3	-	3
CO 2	They are also exposed to various design issues in the distribution systems	3	1	-	-	2	-	-	-	2	1	1
CO 3	A detail understanding of design guidelines of vertical transportation system in current trends.	1	-	1	-	2	1	-	-	-	1	-
CO 4	A detail understanding of design guidelines of vertical transportation system in current trends.	2	1	-	3	-	3	-	2	1	-	1
CO 5	Exposed to students, specialized service in buildings like air-conditioning, its	1	-	3	3	1	2	-	3	3	2	2

	principles, components, applications, safety measures, fire-safety in buildings, fire resistant materials, and devices for safety detection of fire, gadgets involved, precautionary measures, and integration of these in architectural design.											

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615ART04 **MATERIALS & CONSTRUCTION VI** **L T P C**
1 0 4 3

AIM

To inform students on the recent construction technology developed by leading research organization in India with a thrust on materials that are developed in this context. The students will also gain knowledge on vertical movement systems in multi – storied and high – rise buildings, the various mechanisms and devises, detailing of innovative built in furniture their installations, working so as to integrate them in the process of design.

COURSE OBJECTIVES:

- To make students gain knowledge on innovative construction techniques adopted for floor, wall and roofing by research organization and its examples.
- To further inform students on advanced techniques in foundation with a thrust on pile and precast slabs application detail through construction drawing.
- To make the students understand the various types of vertical movement like lifts and escalators in terms of their varieties, installations in planning, contextual application with certain details for making them barrier free, through construction and detail drawings.
- To expose to the students other novel systems of horizontal movements like conveyors and moving walk – ways through basic input of theory and working drawing.
- To study on innovative structures for built-in furniture in the construction industry.

UNIT I CONSTRUCTION SYSTEMS DEVELOPED BY RESEARCH ORGANISATION **15 Hrs**

Study of Construction Techniques through research organizations like CBRI, HUDCO, SERC andBMPTC. Floor, wall and roofing systems. - Ferro cement its properties, uses and application in building construction including the techniques of preparation, casting, curing, etc.

Exercise on: column, Compound wall, and security cabin & water tank.

UNIT II PRECAST STRUCTURES **15 Hrs**

Pile foundation-different types of piles, details of pile capping, joints of precast piles, wall and columns. Precast and cast in-situ with reinforcement details for different types of flat grid/ Waffle slabs.

Exercise on: Precast housing project and lobby design for shopping mall.

UNIT III VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS I **20 Hrs**

Elevators - Historical development of elevators or lifts. Elevators - size, capacity, positioning of core under planning grid.

Types of elevators - Electric, hydraulic - passenger, hospital, capsule, freight, etc. Dumb waiters, details of lift shaft and other mechanism.

Exercise on: Passenger lift for high rise building, commercial building. Capsule lift for low rise building, Dump waiter for laundry and kitchen restaurants and Hospital lift.

UNIT IV VERTICAL MOVEMENT EQUIPMENTS IN BUILDINGS II **10 Hrs**

Escalators -Historical development of Escalators. Escalators types -Parallel and criss cross escalators. Exercise on: Escalators details in shopping mall. Mechanism and working of Escalators with details.

UNIT V HORIZONTAL MOVEMENT EQUIPMENTS IN BUILDINGS **15 Hrs**

Conveyors and Travelator - Historical development of Conveyors and Travelator its types such as horizontal belt, horizontal moving walkways - concern for physically handicapped mechanical safety systems and automatic detailing and fitting for physically handicapped such provisions for

the wheel chairs used in the Travelator. Exercise on: cargo section understanding about top and ground Conveyors details. Moving walkways at Airports, Public transport and Supermarkets.

TOTAL : 75 Hrs

COURSE OUTCOMES:

The students should be able to understand:

CO1: How to innovate better technology through the recent research building materials and its advantage in building industry.

CO2: Knowing the advance and techniques used for the large precast foundation and large span slabs supports.

CO3: Acknowledge on the Elevators and Escalators its function and their installation details.

CO4: Exercise the knowing it on the Conveyors system in building and their advantage and usages.

CO5: Understanding the modern usages of built- furniture and fitting etc, the aesthetic appeal and efficiency in building construction.

TEXT BOOKS:

1. Concrete Technology by Shetty M.S.
2. Handbook on Safety Code for Elevators and Escalators A17.1/CSA B44 – 2013- byASME
3. The Vertical Transportation Handbook, 4th Edition by George R. Strakosch (Editor), Robert S. Caporale (Editor)

REFERECES:

1. J.H.Callender, Time Saver Standard for Architectural Design Data, McGraw-Hill, 1994.
2. James Ambrose, Building Construction, Service Systems, Van No strand Reinhold, New York, 1992.
3. Pamphets supplied and other literatures from N.B.O., SERC, CBRI, 1970 onwards.
4. R.Chudley, Construction Technology, Richard Clay (Chaucer Press) Ltd., Suffolk, 1978.
5. NATIONAL BUILDING CODE OFINDIA PART 8 BUILDING SERVICES- Section 5 Installation of Lifts and Escalators
6. The Modern Wonder Book of Knowledge by Henry Chase.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	How to innovate better technology through the recent research building materials and its advantage in building industry.	2	3	-	3	1	-	-	3	3	-	3
CO 2	Knowing the advance and techniques used for the large precast foundation and large span slabs supports.	3	1	-	-	2	-	-	-	2	1	1
CO 3	Acknowledge on the Elevators and Escalators its function and their installation details.	1	-	1	-	2	1	-	-	-	1	-
CO 4	Exercise the knowing it on the Conveyors system in building and their advantage and usages.	2	1	-	3	-	3	-	2	1	-	1
CO 5	Understanding the modern usages of built- furniture and fitting etc, the aesthetic appeal and efficiency in building construction.	1	-	3	3	1	2	-	3	3	2	2

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615ARP05	DESIGN STUDIO VI	L T P C 0 0 12 6

COURSE OBJECTIVE:

- 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.
- To balance complex planning needs in buildings of large floor areas and diverse requirements.
- To critically question and creatively address aspects such as sustainable architecture and greenbuildings.
- To explore advanced computer aided presentation techniques involving 2D and 3Ddrawings andvirtual models, apart from physical models.
- To inculcate the importance of services integration and construction in spatial planning in the contextof design of high-rise buildings and service intensive buildings.

CONTENT:

Scale and Complexity: Planning and designing of large scale housing and building projectsthat address the social and cultural needs of contemporary urban life, advance building services, sustainable design practices, multiple storied and [illegible] systems for large scale design projects.Importance of urban development regulations, building by-laws and architectural controls.

Thrust will be also on use of computer for presentation skills and introducing elements and detail for making building barrier free. Application and use of relevant building bye-laws and provisions of National Building Code

Areas of concern / focus

- Planning integration and detailing.
- Landscape details.
- Structural viability and interiors components.
- Sustainable building practices
- intelligent building techniques and service integration

Typology/ project: College, office buildings (Institutional) Large Commercial Complex (Commercial) , Convention centre, Health Care and hospitality, Mixed Residential Developments (Residential).

Working drawings for any one design Using Computer for presentation Skills

TOTAL: 180 Hrs

COURSE OUTCOMES:

CO 1: The student would be able to balance diverse aspects of buildings by making right choices in design situations after studying various criteria.

CO 2: They would be able to apply knowledge in realms such as sustainable built environment, services and complex building designs.

CO 3: Student enabled 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.

CO 4: Understood that stress also shall be on making such buildings barrier free and adopting green building practices in design and detailing.

CO 5: Gained knowledge about the importance of services integration and construction in spatial planning with respect the site context.

TEXTBOOKS:

1. Sustainable Design, Ecology, Architecture & Planning, Daniel Williams, John Wiley & sons Inc, NJ, 2007.
2. MiliMazumdar, Energy Efficient Buildings in India, TERI, New Delhi, 2012.
3. Sustainable Building Design Manuals I & II, TERI 2004.

REFERENCES:

1. Watson, D.(Editor), "Time-saver Standards for Architectural Design: Technical Data f Professional Practice", McGraw-Hill Co., 2005.
2. Neufert, P., "Architects" Data", 3rd Ed., Blackwell Science.
3. Ed.By.Quentin Pickard RIBA - The Architects' Hand Book - Bladewell Science Ltd. - 2002
4. Chiara, J.D., Panero, J., Zelnik, M., "Time Saver Standards for Housing and Resident Development", 2nd Ed., McGraw-Hill.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The student would be able to balance diverse aspects of buildings by making right choices in design situations after studying various criteria.	-	2	-	3	3	1	-	-	2	2	3
CO 2	They would be able to apply knowledge in realms such as sustainable built environment, services and complex building designs	2	2	-	3	3	2	-	-	3	2	3
CO 3	Student enabled 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.	-	2	-	3	3	1	-	-	3	2	3
CO 4	Understood that stress also shall be on making such buildings barrier free and adopting green building practices in design and detailing	2	-	-	3	3	1	-	-	3	2	3
CO 5	Gained knowledge about the importance of services integration and construction in spatial planning with respect the site context	2	-	-	3	3	1	-	1	3	2	3

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615ARE03 **SUSTAINABLE PLANNING AND ARCHITECTURE** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To provide students with a comprehensive background of the sustainability movement within the design and construction field
- To supply students with both technical and philosophical positions on sustainability
- To give students the skills necessary to examine design schemes and propose sustainable possibilities
- To expand critical thinking and analysis skills, as well as further develop research and writing abilities.
- To help students understand that design is also a product of political, social and economic decisions
- To provide student with the ability to distinguish between sustainable and unsustainable design characteristics

UNIT I INTRODUCTION **6 Hrs**

Elaborate the concept of sustainable development and design from an interdisciplinary perspective; historical context – Brunt land Commission –Rio Summit - Agenda 21. Cradle-to cradle approach in built environment by McDonough, overview of different designs principles and models of sustainable design ex: Biomimicry as a nature inspired design.

UNIT II RESOURCE EFFICIENCY **10 Hrs**

Building energy literacy as a foundation for sustainable design. Study of eco-friendly building materials, construction technologies, energy sources - renewable and non-renewable. Introduction to carbon footprint, concept of life cycle analysis with multiple case studies, followed by a field trip.

UNIT III PRACTICE OF SUSTAINABLE ARCHITECTURE **12 Hrs**

Introduce the standards and metrics for sustainable buildings; understanding the rationale and structure of the rating systems. Categories with LEED rating system will be elaborated. Examples of rating systems and case studies: LEED, BREAM and DGNB.

UNIT IV RATING SYSTEMS IN INDIAN CONTEXT **9 Hrs**

Introduce Zero Energy Buildings (ZEB) with examples. Examples of rating systems in Indian context: Role of IGBC- EDGE and GRIHA, with case studies.

UNIT V FUTURE OF SUSTAINABLE DESIGN: PLANNING AND POLICIES **8 Hrs**

Living Buildings as a philosophy of sustainable design, Biomimicry, Carbon neutral cities and Sustainable Development Goals (SDG).

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: The course ends with the completion of an "impact project", where students will collaborateto design/learn and implement a short project that addresses the myriad problems and opportunities presented by sustainability.

CO2: To provide student with the ability to distinguish between renewable & non- renewable sources.

CO3: Understanding on green organizations worldwide and with Indian context.

CO4: Exposed to the Rating systems with Indian Examples.

CO5: To sensitize students about the importance and need for Sustainable Planning concept andAppropriate Architectural Design concepts as an emerging thrust area.

TEXT BOOKS:

1. "Elevating Habitat" by Coffman;
2. "Design on the Prairie" by Myers
3. "Ecological Design" by Sim Van Der Ryn and Stuart Cowan
4. Bioclimatic Architecture – ENEA and IN/ARCH publication Edition 1989
5. McDonough, W. (1993) Design, Ecology, Ethics and the Making of Things.

REFERENCES:

1. Beer, Environment Planning for Site Development.
2. Sustainable Architecture and Urbanism: Concepts, Technologies and examples by auzin-Muller(D) – Birkhauser 2002.
3. Eco-Tech : Sustainable Architecture and High Technology by Slessor© - Thames and Hudson 1997.
4. Ecodesign : A manual for Ecological Design by Yeang(K) – Wiley Academy 2006.
5. Brotoc, Sustainable architecture high-tech housing.
6. Roofs, Eco-house a design guide.
7. Sharma, Brij Kishore, " Introduction to the Constitution of India:, Prentice Hall of India, New Delhi.
8. U.R.Gahai, " (1998) Indian Political System ", New Academic Publishing House, Jalaendhar.
9. R.N. Sharma, " Indian Social Problems ", Media Promoters and Publishers Pvt. Ltd.
10. Yogendra Singh, " (1997) Social Stratification and Charge in India ", Manohar, New Delhi..Manik&GirishKomisva, IIPA, keeping Cities Clean and Green, Uppal Publishing House, 1997.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The course ends with the completion of an "impact project", where students will collaborateto design/learn and implement a short project that addresses the myriad problems and opportunities presented by sustainability.	-	-	2	3	-	1	-	-	2	3	1
CO 2	To provide student with the ability to distinguish between renewable & non- renewable sources.	1	-	1	3	-	1	-	-	2	3	-
CO 3	Understanding on green organizations worldwide and with Indian context	1	-	2	3	-	1	-	-	2	3	2
CO 4	Exposed to the Rating systems with Indian Examples.	2	-	-	3	-	1	-	2	2	3	2
CO 5	To sensitize students about the importance and need for Sustainable Planning concept and Appropriate Architectural Design concepts as an emerging thrust area	2	-	1	3	-	1	-	3	2	3	1

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615ARE04 **GRAPHIC AND PRODUCT DESIGN** **L T P C**
1 0 2 3

COURSE OBJECTIVES:

- To impart an understanding of the scope and nature of Graphic design as a discipline.
- To introduce the principle of a Graphic design and enhance their ideas in design application.
- To understand the evolution of design, development and challenges in Product design.
- To understand the ergonomics in product design.
- To develop skills to conceptualize, create and market an appropriate product.

UNIT I INTRODUCTION TO GRAPHIC DESIGN **8 Hrs**

Graphic design – elements, principles and their applications. Basics of Typography, Grid systems, Identity Design, logo design. Stationery design: Visiting cards, Envelope design, Letterhead design.

UNIT II GRAPHIC DESIGN APPLICATIONS **8 Hrs**

Introduction to software packages for graphic design applications - Shape, connotation of forms, sign mounting and size considerations, formats, folding and binding. Label designs for product packaging on paper and cardboards mock-ups. Design for Print media.

UNIT III INTRODUCTION TO PRODUCT DESIGN **10 Hrs**

Product Design – an introduction, Definition of Product Design, Product Design methods, Role of Product Designers. Form Studies - Concept of Form and Space, Form elements and their properties, Study of Form relationship, Organization of form, Balance, Orientation of form. Considerations of Colour, Pattern, Texture and Proportion in products and product environments. Relating Form to Materials. Use of Computers for Form generation. Manufacturing Processes.

UNIT IV ERGONOMICS IN PRODUCT DESIGN **9 Hrs**

Terminologies in ergonomics – biomechanics, comfort zone – elements of comfort analysis and designing product based on ergonomics, materials, working parameters and visual perception for products. Selection of the projects is based on customer needs.

UNIT V DESIGN EXERCISES **10 Hrs**

The project is supported by detailed discussion on various stages in the design process emphasizing the complementary nature of systematic and creative thinking. Design of Household elements– lamp shade, wall clock, table vase etc. Design of furniture – Chairs/Computer table, Kitchen racks, Cabinets etc. Design of outdoor elements- garden furniture, lamp holders, water bowls etc. Element design for the physically and mentally different people.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: The students understood the role of Graphic and product design as a discipline, and its role in understanding and interpreting a real life design.

CO2: Explored on applications of graphic design in terms of packaging and labeling, its extent in media industry.

CO3: Various reading methods were explored, to understand the contemporary design process as well as manufacturing process of product design.

CO4: Understood the ergonomic standards in various product design and experience through case examples.

CO5: Exploration of design ideas through various exercise was done for reference.

TEXT BOOKS:

1. J. Bowers, Introduction to Two- Dimensional Design: Understanding Form and Function, John Wiley and Sons, 1999.
2. L. Holtzschue, Understanding Colour: An Introduction for Designer, 2nd Edition, John Wiley and Sons, 2002.
4. B. Gordon and M. Gordon, Complete Guide to Digital Graphic Design, Thames and Hudson, 2002.
5. P. B. Meggs, Typographic Design: Form and Communication, John Wiley and Sons, 2000.
6. P. B. Meggs, Type and Image: The Language of Graphic Design, VNR, 1992 R.

REFERENCES:

1. H. G. Greet and R. R. Kostellow, Elements of Design and the Structure of Visual Relationships, Architectural Press, NY, 2002.
2. K. Critchlow, Order in Space: A Design Source Book, Thames and Hudson, 1969.
3. C. Akner-Koler, Three-dimensional Visual Analysis, Institution for Industrial design, Konftfack, Sweden, 1994.
4. Practical Methods for the Systematic Development of New Products, Publisher: Chapman & Hall, 1995.
5. Roozenburg and Eekels, Product Design: Fundamentals and Methods, Publisher: John Wiley & Sons Inc; New Ed edition, 1995.
6. Goodrich, Kristina; Design Secrets: Products: 50 Real-Life Projects Uncovered - Industrial Designers Society of America, Publisher: Rockport Publishers June 2001.
7. Rouse, William B.; Design for Success: A Human-Centered Approach to Designing Successful Products and Systems, Publisher: Wiley-Interscience; 1991.
8. J.M. Gordon Jr., Industrial Design of Plastics Products, John Wiley and Sons, 2003.

Course Outcomes		Program Outcomes								Program Specific Outcomes		
CO's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3
CO 1	The students understood the role of Graphic and product design as a discipline, and its role in understanding and interpreting a real life design	3	-	2	2	2	-	1	1	2	3	-
CO 2	Explored on applications of graphic design in terms of packaging and labeling, its extent in media industry	3	-	2	2	2	-	1	1	2	3	-
CO 3	Various reading methods were explored, to understand the contemporary design process as well as manufacturing process of product design.	3	-	2	2	2	-	1	1	2	3	-
CO 4	Understood the ergonomic standards in various product design and experience through case examples	3	-	2	2	2	-	1	1	2	3	-
CO 5	Exploration of design ideas through various exercise was done for reference	3	-	2	2	2	-	1	1	2	3	-

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711ARP01	INTERNSHIP PROGRAM I	L T P/S C 0 0 0 13

COURSE OBJECTIVES:

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

OUTLINE:

The internship program would be done in offices with a minimum of 5 years professional Experience empanelled by the Institution and in firms registered under the Council of Architecture.The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The student is expected to be exposed to preparation of working drawing, detailing, preparation of architectural models, computer applications in design and drafting, filing system in respect of documents, drawing and preparation of tender documents. Site experience may be given in respect of supervision of the construction activity, observing the layout on site, study of the stacking methods of various building materials, study of taking measurement and recording. Students will have to maintain a day to day record of their engagement for the period of training. This will be recorded in an authorized diary to be counter signed by the architect at the end of each month and the same diary shall be sent to the department once in a month. At the end of the training period, a student will have to produce a certificate of experience and satisfactory performance from the concerned office in the prescribed format. At the end of the Internship program a portfolio of work done during the period of internship along with certification from the offices are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

TOTAL: 16 WEEKS

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811ARP01	INTERNSHIP PROGRAM II	L T P C 0 0 0 12

COURSE OBJECTIVES:

- To facilitate an understanding of the evolution of an architectural project from design to execution.
- To enable an orientation that would include the process of development of conceptual ideas, presentation skills, involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure, site supervision during execution and coordination with the agencies involved in the construction process.

OUTLINE:

The internship program would be done in offices with a minimum of 5 years professional Experienceempanelled by the Institution and in firms registered under the Council of Architecture.

The progress of practical training shall be assessed internally through submission of log books supported by visual documents maintained by students every month along with the progress report from the employer/s of trainees.

The student is expected to be exposed to preparation of working drawing, detailing, preparation of architectural models, computer applications in design and drafting, filing system in respect of documents, drawing and preparation of tender documents. Site experience may be given inrespect of supervision of the construction activity, observing the layout on site, study of thestacking methods of various building materials, study of taking measurement and recording.

A candidate failing in the viva examination shall repeat the training afresh for 16 weeks, the starting date coinciding with the beginning of a subsequent even or odd semester.

The student has the choice of working with the same architectural firm during the 7th and 8th semesters or with two different architectural firms. However, the work presented for the viva voce exam shall relate only to the period of the corresponding semester. The work presented for 7th semester shall not be presented again during the 8th semester.

Students will have to maintain a day to day record of their engagement for the period of training. This will be recorded in an authorized diary to be counter signed by the architect, the same has to be submitted to the department for the viva voce examination.

At the end of the Internship program a portfolio of work done during the period of internship along with certificate of experience from the office are to be submitted for evaluation by a viva voce examination. This will evaluate the understanding of the students about the drawings, detailing, materials, construction method and service integration and the knowledge gained during client meetings, consultant meetings and site visits.

TOTAL: 16 WEEKS

911ART01 **PROFESSIONAL PRACTICE AND ETHICS** **L T P C**

3 0 0 3

COURSE OBJECTIVES:

- To give an introduction to the students about the architectural profession and the role ofprofessional bodies and statutory bodies.
- To make student understand the various types of services that an arcty7hitect can offer to society and the associated professional structure.
- To teach the students about the importance of code of conduct and ethics in professionalpractice and the mandatory provisions as per Architects Act 1972.
- To expose the students some of the important legal aspects and legislations which have abearing on the practice of architectural profession.
- To enable the students to grasp the advanced issues concerning professional practice suchas tendering, contracting including alternative practices in project execution and projectmanagement.

UNIT I INTRODUCTION TO ARCHITECTURAL PROFESSION **9 Hrs**

Importance of Architectural Profession – Role of Architects in Society – Registration of Architects – Architect's office and its management – Location, organizational structure – Infrastructure requirement, skills required, elementary accounts – Tax liabilities.

Role of Indian Institute of Architects – Architects Act 1972 (intent, objectives, provisions with regard to architectural practice) – Council of Architecture (role and functions) – Importance of ethics in professional practice – Code of conduct for architects, punitive action for professional is conduct of an architect.

UNIT II ARCHITECT'S SERVICES, SCALE OF FEES & COMPETITIONS **9 Hrs**

Mode of engaging an architect – Comprehensive services, partial services and specialized services – Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement – Letter of appointment. Importance of Architectural competitions – Types of competitions (open, limited, ideas competition) – Single and two stage competitions – Council of Architecture guidelines for conducting Architectural competitions – National and International Competitions – Case studies.

UNIT III TENDER & CONTRACT **12 Hrs**

Tender - Definition - Types of Tenders - Open and closed tenders - Conditions of tender– Tender Notice - Tender documents - Concept of EMD - Submission of tender -Tender scrutiny - Tender analysis – Recommendations – Work order - E-tendering(advantages, procedure, conditions).Contract – Definition - Contract agreement - its necessity – Contents (Articles of Agreement, Terms and Conditions, Bills of Quantities and specifications, Appendix) – Certification of Contractors Bills at various stages. New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO, etc.) - Execution of projects – The process (Expression of interest, Request for Proposal, Mode of Evaluation of Bids, Award of work)

UNIT IV LEGAL ASPECTS **8 Hrs**

Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award, Conduct of arbitration proceedings) – Arbitration clause in contract agreement (role of architect, excepted matters) Easement – (meaning, types of easements, acquisition, extinction and protection)Copy rights and patenting – (provisions of copy right acts in India and abroad, copy right in architectural profession)Consumer Protection Act (Intent, Architects responsibility towardshis clients)

UNIT V LIABILITY OF ARCHITECTS **7 Hrs**

Types of Liabilities, Professional Duties and Conduct of Architects, Professional Negligence, Deficient Service and Exceptions, Insurance, Examples of Cases.

TOTAL: 45 Hrs

COURSE OUTCOME:

CO 1: Awareness of the architect's role in society, managements and its acts.
CO 2: To understand the services to do the profession with scale off charges and ethics.
CO 3: Understanding the tender and document and types of competition.
CO 4: Understanding the bye laws and duties of architect in the society.
CO 5: Understanding the conducts and duties and its liabilities.

TEXT BOOKS:

1. Architects Act 1972.
2. Publications of Handbook on Professional practice by IIA.
3. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989, Architectural Competition guidelines
4. RoshanNamavati, "Professional practice", Lakhani Book Depot, Mumbai 1984.
5. Ar. V.S. Apte, "Architectural Practice and Procedure", Mrs. PadmajaBhide, 2008
6. Arbitration Act, 2005
7. J.J.Scott, "Architect's Practice", Butterworth, London, 1985

REFERENCES:

1. Development Regulations of Second Master Plan for Chennai Metropolitan Area -2026.
2. T.N.D.M. Buildings rules, 1972.
3. Consumer Protection Act, 2011

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911ART02 **HUMAN SETTLEMENTS & PLANNING** **L T P C**
3 0 0 3

COUSRE OBJECTIVES:

- To enable students to understand the evaluation and growth of the settlements in the nature and it's elements (Content and Container)
- To familiarize the students with Planning concepts and process in Urban and Regional Planning.
- To enable student understand about the various planning principles followed by various town planners through the history.
- To enable students understand how planning activities are regulated in the state at various levels.
- To expose students to the origin, growth and development of human settlements from ancient times to the present context and to understand Human Settlements as an expression of Civilization and Culture.

UNIT I **INTRODUCTION TO HUMAN SETTLEMENTS** **10 Hrs**

Elements & Types of Human Settlement – Human Settlements as expression of Civilization, Physical form, nucleus of settlement growth during different periods up to the industrial revolution. Socio-Political context and their effect on settlement development during medieval ands renaissance periods. A synopsis of settlement development from prehistoric period to Modern times Greek, Roman, Egypt and Medieval settlements. Role of man and society for the growth & decay of human settlements. Change in mode of Production. Shift of population and the concentration of activities. Impact of industrialization and urbanization.

UNIT II **FORMS OF HUMAN SETTLEMENTS** **9 Hrs**

Structure and form of Human settlements – Linear, non-linear and circular – nature shells & Net work – their functions and Linkages – Anatomy & classification of Human settlements – Locational, Resource based, Population size & Occupational structure.

– Combinations – reasons for development – advantages and disadvantages – case studies – factors influencing the growth and decay of human settlements. Factors influencing the growth and decay, growth pattern of urban settlements during the last one-century in our country. Structure and Form of Human settlements: Different physical forms, examples and their functional characteristics.

UNIT III **PLANNING CONCEPTS** **10 Hrs**

Principles of ancient town planning in India. Evolution of settlements, their planning and building.Planning concepts and their relevance to Indian Planning practice in respect of Ebenezer Howard –Garden city concepts and contents – Patrick Geddes – Conservative surgery – case study – C.A.Perry – Neighborhood concept Le Corbusier – concept and case studies.

UNIT IV **URBAN PLANNING AND URBAN RENEWAL** **8 Hrs**

Aim, objective, scope and content of Regional plan, Master plan, zonal plan and urban renewal plan. Scope and Content of Master plan – planning area, land use plan and Zoning regulations –zonal plan – need, linkage to master plan and land use plan – planned unit development (PUD) –need, applicability and development regulations - Urban Renewal Plan – Meaning ,Redevelopment, Rehabilitation and Conservation – JNNURM – case studies.

UNIT V **ISSUES IN CONTEMPORARY URBAN PLANNING IN INDIA** **8 Hrs**

Globalization and its impact on cities – Urbanization, emergence of new forms of developments – self sustained communities – SEZ – transit development – integrated townships – case studies.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: Basic understanding and presentations on the Structure and form of Human settlements

CO2: Various reading methods were explored, to understand the historical as well as present urban form, the dynamics of Urban Form and various Human Settlements pattern

CO3: An understanding of the interrelationship between Human Settlements structure and Social Dynamics.

CO4: Expose students to the origin, growth and development of human settlements from ancient times to the present context and to understand Human Settlements as an expression of Civilization and Culture.

TEXT BOOKS:

1. C.L.Doxiadis, Ekistics, "An Introduction to the Science of Human Settlements", Hutchinson, London, 1968.
2. Andrew D.Thomas, "Housing and Urban Renewal", George Allen and Unwin, Sydney, 1986.
3. "Ministry of Urban Affairs and Employment", Government of India, New Delhi,1999 '
4. "Urban Development Plans: Formulation & Implementation" , Guidelines, 1996.
5. Madras Metropolitan Development Authority, 'Master Plan for Madras Metropolitan Area, Second Master Plan, 2007.

REFERENCES:

1. Government of India, "Report of the National Commission on Urbanisation", 1988.
2. Hansen N., "Regional Policy and Regional Integration", Edward Elgar, UK, 1996.
3. Sandhu. R. S., "Sustainable Human Settlements", Asian Experience, Rawat publications,
4. 2001.
5. Gastek.P.,"Living Plans:New concepts for advanced housing", Brikhauser publications, 2005.
6. JohnRatchiffe, An Introduction to Town and Country Planning.
7. Gallion Arthur B &Eisna Simon, The Urban Pattern: City Planning and Housing..L.R. Kadiyali, Traffic Engineering and Transport Planning.
8. Rodwin, Lloyd, ed., 1987. Shelter, Settlements and Development (Hemel Hempstead, United Kingdom, Unwin Hyman Ltd.)

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911ART03 **DISASTER MITIGATION AND MANAGEMENT** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To create an understanding of the causes and consequences of disasters and increase awareness to disaster resistant design issues as a significant source of inspiration to facilitate the integration of structure and architectural design.
- To create an awareness of all types of disaster resistant building designs and management systems.
- To expose the students to the different types of natural and man made disasters and the various methods of managing them. To make them aware of the disaster resistant construction techniques.

UNIT I NATURAL HAZARDS AND BUILDING SAFETY **9 Hrs**

Natural hazards- Brief description on cause and formation of flood, cyclone, earthquake, tsunami and landslides. Zoning and classification by Center/ State government organizations.Geologic hazards and natural disasters- how to recognize and avoid them- hazards of faulting- hazards of geologic foundations- problems of land fill, hill sites, coastal sites, bayside, riverside, old water course sites.

UNIT II MAN MADE HAZARDS AND BUILDING SAFETY **4 Hrs**

Man made hazards- Fire, gas, chemical leakages, pollution, and health hazards. Man made disasters- vulnerability analysis and risk assessment.

UNIT III CONCEPTS FOR DISASTER RESISTANT DESIGN **12 Hrs**

Vernacular and historical experiences- case studies. Site selection and site development- building forms- seismic effects related to building configuration- spatial aspects- contemporary/ international approaches for low rise, mid-rise and high-rise buildings. Seismic design principles and concepts- ductility based design and seismic base isolation.

UNIT IV ARCHITECTURAL AND STRUCTURAL HAZARDS OF NATURALDISASTERS **12 Hrs**

Principles of wind forces, earthquake forces on buildings- best and worst- types of construction for cyclone and earthquake resistance.Innovations and selection of appropriate materials- IS code provisions for buildings- disaster resistant construction details.

UNIT V INTERIOR/ UTILITY DAMAGES- REMEDIES AND POST OPERATIVE MEASURES FOR DISASTER MANAGEMENT **8 Hrs**

Methods to minimize damage to Utilities – plaster/ wall boards/ furnishings/ swimming pools/ antennas/ free standing retaining masonry walls Other remedies and post operative measures- cyclone and earthquake insurance- Training for before and after natural hazards and ways to protect family, property and oneself from natural calamities. Role of international, national and state bodies- CBRI, NBO and NGOs in disaster mitigation and community participation.

TOTAL : 45 Hrs

COURSE OUTCOMES:

CO1: Students ability to understand the formation and causes of various disasters and the factors to be considered in the Design of buildings and services to resist them.

CO2: Case study of the disasters happened worldwide could be presented.

TEXT BOOKS:

1. 'Belen Garcia;- Earthquake Architecture 2000- Loft Publications, NY
2. Naseem Ahmed- Managing Disasters- Kilaso Books N. Delhi, 2003
3. Tarnath B S; Wind and Earthquake resistant buildings- Marcel Dekkar,2005

REFERENCES:

1. Mary C Comerio; Disaster Hits Home, New policy for Urban Housing Recovery, Oxford University Press, London; 2001
2. Proceedings – Learning from practice- Joint US and Italy Workshop- October 18- 23; 1992;

National Science Foundation; US
3. Earthquake Resistant Design and Construction of buildings- Code of Practice- Bureau of Indian Standards; 1993
4. Encyclopedia of Disaster Management Policy and Administration, Vol. I, S. L. Goel, Deep of Deep Publication Pvt. Ltd., New Delhi, India.
5. Encyclopedia of Disaster Management Policy and Administration, Vol. II, S. L. Goel, Deep of Deep Publication Pvt. Ltd., New Delhi, India.

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911ARP04 **ARCHITECTURAL DESIGN - VI** **L T P C**
0 0 12 5

COURSE OBJECTIVES:

- To enable student to appreciate that complex architectural design projects at city scale bring in other issues relating to various sectors of urban development.
- To sensitize students that complex design projects have their appropriate long-term environmental impacts.
- To enable them to choose solutions in terms of material choice, technology, feasibility, innovativeness and imaginative in terms process and end products.
- To enable the student at final stage, develop confidence to handle projects at city scale and as civic projects.
- To create awareness that architecture is an integral part of city environment and to sensitize that design programmes have their own environmental impacts.

DESIGN STUDIO

Design projects pertaining to Urban Design problems including Urban Renewal and Redevelopment - Involving intensive study of visual and other sensory relationship between people and their environment, problems concerning both preservation and development based on correlation of socio-economic and physical state and problems pertaining to traffic – Design and detailing for physically handicapped at the city/street/building scale.

Examples: Hill Architecture, High Tech Buildings, Green buildings, urban nodes/streets/district Large Transportation terminals, Conservation and Re-development, revitalization of historic core, etc.

TOTAL : 180 Hrs

COURSE OUTCOMES:

CO1: The students looked at various components and aspects associated with the urban environment in terms of physical infrastructure, socio cultural aspects, gender issues etc. and looked at ways to address them through their designs.

CO2: Mapping and diagramming techniques were explored in the design process to help explore the design process better.

TEXT BOOKS:

1. Jonathan Barnett, "An Introduction to Urban Design", Harper & Row, 1982
2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999.
3. I. Jawgeih, "Life between Buildings", Using Public Space, Arkitektens Forleg 1987.
4. Donald Watson, "Time Savers Standard for Urban Design", McGraw Hill, 2005.
5. Malcolm moor, "Urban design Futures", Routledge, 2006.

REFERENCES:

1. Edmund Bacon , "Design of Cities" , Penguin, 1976
2. Gordon Cullen, "The Concise Townscape", The Architectural Press, 1978
3. Lawrence Halprin, "Cities", Revised Edition, MIT Press 1972.
4. Gosling and Maitland, "Urban Design", St. Martin's Press, 1984
5. Kevin Lynch, "Site Planning", MIT Press, Cambridge 1967

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911AET01 **ARCHITECTURAL CONSERVATION** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To introduce the various issues and practices of Conservation.
- To familiarize the students with the status of conservation in India and the various agenciesinvolved in the field of conservation worldwide and their policies.
- To outline the status of conservation practice in the country and the various guidelines for thepreservation, conservation and restoration of buildings.
- To inform the students about the character and issues in our heritage towns through casestudies.
- To understand the values and ethics of conservation.

UNIT I INTRODUCTION TO CONSERVATION **9 Hrs**

Understanding Heritage. Types of Heritage. Heritage conservation- Need, Debate and purpose. Defining Conservation, Preservation and Adaptive reuse. Distinction between Architectural and Urban Conservation. International agencies like ICCROM, UNESCO and their role in Conservation

UNIT II CONSERVATION IN INDIA **9 Hrs**

Museum conservation – monument conservation and the role of Archeological Survey of India – role of INTACH – Central and state government policies and legislations – inventories and projects- select case studies of sites such as Hampi, Golconda, Mahabalipuram - craft Issues of conservation

UNIT III CONSERVATION PRACTICE **9 Hrs**

Listing of monuments- documentation of historic structures- assessing architectural character – historic structure report- guidelines for preservation, rehabilitation and adaptive re-use of historic structures- Case studies of Palaces in Rajasthan, Chettinad and Swamimalai dwellings, seismic retrofit and disabled access/ services additions to historic buildings-heritage site management

UNIT IV URBAN CONSERVATION **9 Hrs**

Over view of urban history of India and Tamil Nadu- understanding the character and issues of historic cities – select case studies of towns like Srirangaram, Kumbakonam and Kanchipuramhistoric districts and heritage precincts.

UNIT V CONSERVATION PLANNING **9 Hrs**

Conservation as a planning tool.- financial incentives and planning tools such as Transferable Development Right(TDR)-urban conservation and heritage tourism-case studies of sites like for Cochin, Pondichery French town.- conservation project management.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO1: An understanding of the heritage structures in the surrounding precinct is to be documented and presented.

CO2: Case study of the renowned conservation projects to be presented.

CO3: To expose students to conservation process and methodology, Need for them in Indian context.

CO4: To expose students on the various conservation techniques through case studies.

TEXT BOOKS:

1. Donald Appleyard, "The Conservation of European Cities", M.I.T. Press, Massachusetts, 1979.
2. James M. Fitch, " Historic Preservation: Curatorial Management of the Built World" University Press of Virginia; Reprint edition, 1990
3. Robert E. Stipe, A Richer Heritage: Historic Preservation in the Twenty-First Century" ,
4. Univ. of North Caroling press, 2003.
5. Conservation Manual , Bernard Fielden; INTACH Publication, 1989.

REFERENCES:

1. B.K. Singh, "State and Culture", Oxford, New Delhi
2. A.G. K. Menon ed. "Conservation of Immovable Sites", INTACH Publication, N.Delhi., 1988
3. Seminar Issue on Urban Conservation

911AET02 **CONSTRUCTION AND PROJECT MANAGEMENT** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- The understand different management techniques suitable for planning and constructional projects.
- To understand the management system for accomplishing the task efficiently in terms of bothtime and cost.
- To introduce the various issues related to construction management planning and safety planning.

UNIT I INTRODUCTION TO PROJECT MANAGEMENT **4 Hrs**

Project management concepts-objectives, planning, scheduling Controlling and role of decision in project management. Traditional management system, Gantt's approach, Load chart. Progress Chart, Development of bar chat, Merits and Demerits.

UNIT II PROJECT PROGRAMMING AND CRITICAL PATH METHOD **15 Hrs**

Project Network-Events Activity, Dummy, Network Rules, Graphical Guidelines for Network, numbering the events, Cycles, Development of Network-planning for Network Construction, Modelsof Network construction, steps in development of Network. Work Break Down Structure, hierarchies. Concepts: critical path method-process, activity time estimate, Earliest Event time, Latestallowable Occurrence time, start and finish time of activity, float, critical activity and critical path problems.

UNIT III ANALYSIS **6 Hrs**

Cost model-Project cost, direct cost, indirect cost, slope curve, Total project cost, optimum duration contracting the network for cost optimization. Steps in cost optimization, updating, resource allocation-resource smoothing, resource leveling.

UNIT IV PROGRAMMING EVALUATION REVIEW TECHNIQUE **10 Hrs**

PERT network, introduction to the theory of probability and statistics. Probabilistic time estimation for the activities for the activities of PERT Network.

UNIT V COMPUTERIZED PROJECT MANAGEMENT **10 Hrs**

Introduction: Creating a New project, building task. Creating resources and assisting costs, Refining your project .Project Tracking-Understanding tracking, recording actual. Reporting on progress. Analyzing financial progress.

TOTAL: 45 Hrs

COURSE OUTCOMES:

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

CO 1: Apply the project management techniques in solving the constructional problems efficiently.

CO 2: Different PMT to be applied in respective areas.

CO 3: The course of a work from the start to the finish to analysed before the commencement of the project.

TEXT BOOKS:

1. Dr. B.C. Punmia and K.K. Khandelwal-Project planning and control woth PERT/CPM, Laxmi publications, New Delhi, 1987.
2. Elaine Marmel, Microsoft office Project 2003 Bible, Wiley Dreamtect (P) Ltd., New Delhi, 2004.
3. Sam Kubba, "Green Construction Project Management and Cost Oversight", Elsevier, 2010.

REFERENCES:

1. S.P. Mukhopadyay, "Project Management for architects and Civil Engineers", IIT, Kharagpur 1974.
2. Jerome D. Wiest and Ferdinand K. Levy, "A Managementuide to PERT/CPM", prentice hall of Indian pub.Ltd. New Delhi 1982.
3. SR.A. Burgess and G. White, " Building production and project management", theconstruction press, London 1979

911AET04 **URBAN DESIGN & RENEWAL** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To understand the scope and nature of urban design as a discipline
- To introduce the components of a city and their interdependent roles.
- To understand the evolution of historic urban form and learn to interpret the city in different ways and layers.
- To create awareness of contemporary urban issues as well as learn about possible ways to address them.
- To enable student, understand the meaning, definition and relationship between Architecture, urban design and town planning and the urban environment.
- To enable students, understand the concept of urban renewal, community development and public involvement, in city building process.

UNIT I INTRODUCTION TO URBAN DESIGN **8Hrs**

Relationship between Architecture, Urban Design and Town Planning - Perception of city form and pattern – Townscape elements. Components of urban space and their interdependencies- outline of issues/ aspects of urban space and articulation of need for urban design- scope and objectives of urban design as a discipline.

UNIT II HISTORIC URBAN FORM **12Hrs**

Comparative analysis of public spaces, their organization and articulation in pre-history, early, mediaeval and renaissance periods in western civilization and eastern civilization.
Western: morphology of early cities - Greek agora - Roman forum - Medieval towns- Renaissance place making - ideal cities – Industrialization and city growth - the eighteenth century city builders Garnier's industrial city - the American grid planning- anti urbanism and the picturesque- cite industrielle- cittenuovo-radiant city .
Indian: evolution of urbanism in India- Temple towns - Mughal city form- medieval cities – colonial urbanism- urban spaces in modernist cities: Chandigarh, Bhuvaneshwar and Gandhi Nagarsubsequent directions – case studies.

UNIT III THEORISING AND READING URBAN SPACE **5Hrs**

Understanding, organizing and articulation of spaces for residential, commercial, industrial and recreational areas.Ideas of Imageability and townscape: Cullen, Lynch- place and genius loci- collective memory historic reading of the city and its artefacts: Rossi- social aspects of urban space: life on streets and between buildings, gender and class, Jane Jacobs, Wiiliam Whyte

UNIT IV ISSUES OF URBAN SPACE **8Hrs**

Understanding and interpreting of urban problems/ issues- place-making and identity, morphology: sprawl, generic form, incoherence, privatized public realm- effects/ role of real estate, transportation, zoning, globalisation - ideas of sustainability, heritage, conservation and renewalcontemporary approaches: idea of urban catalyst, transit metropolis, community participation – studio exercise involving the above.

UNIT V BEST PRACTICE IN URBAN DESIGN **12Hrs**

Contemporary case studies from developing and developed economies that offer design guidelines and solutions to address various issues/ aspects of urban space – case studies.

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: The students understood the role of Urban design as a discipline, and its role in understanding and interpreting a city.

CO 2: Various reading methods were explored, to understand the historical as well as present urban form.

CO 3: Addressing urban design issues in terms of awareness creation as well as with possible ways to address them.

CO 4: Exercises on how space in contemporary cities are organized and articulated in various land use zones through select case studies.

TEXT BOOKS:

1. A.E.J. Morris, "History of Urban Form before the Industrial Revolution", Prentice Hall, 1996
2. Edmund Bacon , "Design of Cities", Penguin, 1976
3. Gordon Cullen, "The Concise Townscape", The Architectural Press, 1978
4. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
5. "Time Saver Standards for Urban Design", Donald natson, McGraw Hill, 2003.
6. Kevin Lynch, "The Image of the City", MIT Press, 1960.
7. Rithchie. A, "Sustainable Urban Design: An Environmental Approach", Taylor & Francis, 2000.

REFERENCES:

1. Jonathan Barnett, "An Introduction to Urban Design", Harper Row, 1982
2. Lawrence Halprin, "Cities", Reinhold Publishing Corporation, New York, 1964
3. Gosling and Maitland, "Urban Design", St. Martin's Press, 1984
4. Molcolm Moor, "Urban Design Futures", Routledge, 2006
5. Geoffrey Broadbent, "Emerging Concepts in Urban Space Design", Taylor & Francis, 2003.

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1011ARTH01	THESIS	L T P C 0 0 36 18

COURSE OBJECTIVES:

- To make a student undertake a detailed investigation/ research on a topic of his/her choice (selective design) and come out with comprehensive design proposals/ findings.
- To test whether a student as acquired the requisite skill and competence in architecture before becoming a full fledged archtect

TOPICS OF STUDY

The main areas of study and research shall be Architecture, Urban design, Urban renewal, urban and rural Housing and settlements, Environmental Design, Conservation, Landscape Design, etc. However, the specific thrust shall be on architectural design and environment context with full understanding.

PRESENTATION REQUIREMENTS

The Thesis Project shall be submitted in the form of drawings, project report, models, Slides, C.D's and reports, as required for the project.

TOTAL: 540 Hrs

COURSE OUTCOMES:

CO 1: A comprehensive understanding in handling a major Architectural independently

TEXT BOOKS:

1. Linda Grant and David Wang, "Architectural Research Methods", John Wiley Sons, 2002

REFERENCES:

1. Donald Appleyard, "The Conservation of European Cities", M.I.T. Press, Massachusetts, 1979.
2. Richard Kintermann and Robert, "Small Site Planning for Cluster Housing", Van Nastrand
3. Reinhold Company, Jondon/New York 1977.
4. Miller T.G. Jr., "Environmental Sciences", Wadsworth Publishing Co., 1994
5. Geoffrey And Susan Jellico, "The Landscape of Man", Thames And Hudson, 1987.
6. Arvind Krishnan & Others, " Climate Responsive Architecture", A Design Handbook for
7. Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2007

1011ARE01	URBAN HOUSING	L T P C 3 0 0 3

COURSE OBJECTIVES:

- To understand the need, supply and demand for housing based on statistical data, various housing agencies in housing development, along with their activities.
- To know about the social and economical factor influencing housing design and the various schemes in housing promotion in the Indian context.
- To create awareness about the various standards backed by BIS, NBC, and DCR including layout conditions, Buildings rules related to housing.
- To understand different types of housing in housing design and pattern. The components in housing design, through case studies.
- To study about the various stages involved in development of housing, its management, and how to make the same user friendly through participatory approach.

UNIT I HOUSING ISSUES - INDIAN CONTEXT **6 Hrs**

Need and Demand - National Housing Policy - Housing Agencies and their role in housing development - Impact of traditional life style.

UNIT II SOCIO-ECONOMIC ASPECTS **9 Hrs**

Social factors influencing Housing Design, affordability, economic factors and Housing concepts – Slum Up gradation and Sites and Services.

UNIT III HOUSING STANDARDS **6 Hrs**

Standards and Regulations - DCR relevant to housing - Methodology of formulating standards - Performance standards.

UNIT IV HOUSING DESIGN **15 Hrs**

Traditional patterns - Row Housing and Cluster Housing - Layout concepts - Use of open spaces - Utilities and common facilities - Case studies - High Rise Housing.

UNIT V HOUSING PROCESS **9 Hrs**

Various stages and tasks in Project Development - Housing Management – Community participation - Environmental aspects - Technology

TOTAL: 45 Hrs

COURSE OUTCOMES:

CO 1: Ability to understand issues relating to Housing policy and its impact on housing development in Indian context.

CO 2: Students also learn about Evolution of settlement pattern, Design for diversity, Costing etc for a cross section of income groups and design of Disaster resistant structures.

TEXT BOOKS:

1. Richard Kintermann and Robert small, "Site planning for Cluster Housing", Van Nastrand Reinhold company, Jondon/New York 1977.
2. Joseph de Chiara and others, "Time Saver Standards for Housing and Residential development", McGraw Hill Co, New York 1995.
3. Forbes Davidson and Geoffrey Payne, " Urban projects Manual", Liverpool University press, Liverpool 1983.
4. HUDCO publications – Housing for low income, sector model.

REFERENCES:

1. Christopher Alexander, "A pattern Language", Oxford University press, New York 1977
2. Leuris (S), Front to back: "A Design Agenda for Urban Housing", Architectural Press, 2006.
3. Mohanty. L.N.P., Mohanty. S, "Slum in India" APH Publications., 2005
4. Saxena A. K. , "Sociological Dimensions of Urban Housing and Development ", Common

wealth Publications, 2004
5. Geol. S. L. Dhaliwal. S. S. "Slum improvement through participatory Urban based Community structures", Deep & Deep Publications, 2004.
6. Karnataka state Housing Board - MANE - Publication - 1980.

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1011ARE02 **CONSTRUCTION PLANNING AND MANAGEMENT** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- The understand different management techniques suitable for planning and constructional projects.
- To understand the management system for accomplishing the task efficiently in terms of both time and cost.
- To apply various techniques and methods to efficiently and effectively plan and control construction projects.
- To provide knowledge to integrate ethical decision-making into the construction industry.

UNIT I INTRODUCTION **6 Hrs**

Introduction to Construction management - Project Management – Role of a Manager - Responsibility and Authority - Functions in the Management process.

UNIT II OTHER MANAGEMENTS **10 Hrs**

Materials Management – importance – materials of Construction – Classification – ABC analysis – Estimation of materials requirement - procurement purchase and transportation. Maintenance Management – Repairs, Spare parts inventory.

UNIT III SAFETY IN CONSTRUCTION **10 Hrs**

Safety in Construction practice – general causes of accidents and prevention – Safety legislation – Standards – Health and welfare in Construction – statutory provisions regarding health and welfare at sites.

UNIT IV BUILDING COSTS AND FINANACIAL MANAGEMENT **10 Hrs**

Costs analysis for Control, CVF analysis for planning and control – Contribution approach – relevant and irrelevant costs – Meaning and Scope of financial mamagement – Statement analysis – ratio analysis – funds flow analysis.

UNIT V LEGISLATION **9 Hrs**

Labour legislation – Salient features of – Contract Labour Act 1970 – Inter State Migration Act – 1979, - Factories Act – 1948 – Indian Contract Act – Arbitration Act

TOTAL: 45 Hrs

COURSE OUTCOMES:

At the end of the course, the student should be able to:
CO 1: Apply the project management techniques in solving the constructional problems efficiently.
CO 2: To provide outline for the course of a work from the start to the finish to analysed before the commencement of the project.

TEXT BOOK:

1. Dr. B.C. Punmia and K.K. Khandelwal-Project planning and control woth PERT/CPM, Laxmi publications, New Delhi, 1987.
2. Elaine Marmel, Microsoft office Project 2003 Bible, Wiley Dreamtect (P) Ltd., New Delhi, 2004.
3. Sam Kubba, "Green Construction Project Management and Cost Oversight", Elsevier, 2010.
4. Seetharaman.S., Construction Engineering and Management, Umesh Publications, Newdelhi.

REFERENCES:

1. S.P. Mukhopadyay, "Project Management for architects and Civil Engineers", IIT, Kharagpur 1974.
2. Jerome D. Wiest and Ferdinand K. Levy, "A Managementuide to PERT/CPM", prentice hall of Indian pub. Ltd. New Delhi 1982.
3. SR.A. Burgess and G. White, " Building production and project management", the

construction press, London 1979.
4. Ulimen John " Handbook of Engineering Management -Wiley, New York, 1996.
5. Harris F.C and Mccaffer.R "Modern Construction Management" - Croshy Lockwood Staples. 1997.

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