SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS101	INTRODUCTION TO ARCHITECTURE	2-1-0-0	3	2016

Course Objectives

To give an insight to the students about understanding and analyzing architecture as a curious craft and its timeless ways of existence. The course tries to lay a foundation for a general understanding of Architecture through analyzing the fundamental principles spanning the education, the profession, the art, the science, and the current spirit of Architecture, making the student encounter a broad survey of vocabularies and conceptual processes. This course should become a prelude to learning the History of Architecture and culture of civilizations.

Syllabus

Origin of Architecture - Etymology of the Word 'Architecture', understanding Architecture as Identification of Place - Culture and architecture - Architectural space and rules of architectural geometry - Principles of composition in Architecture - Vernacular architectural form.

Expected Outcome

By the end of the course the student is expected that the students acquire the skills required to interpret a work of architecture and to evaluate, identify, and analyze artistic and technological expression of Architectural forms.

To instill visual and formal analysis of architecture in the minds of students.

To enhance the sketching, written and communication skills of students.

Reference Books

- Bernard Rudofsky; Architecture without Architects; Doubleday & Company, Inc. Garden city, Newyork; 1964
- Hazel Conway and Rowan Roenisch; Understanding Architecture; Routledge Taylor and Francis Group, 2005.
- James C. Snyder, Introduction to Architecture, McGraw-Hill, 1979
- Jonathan A Hale; Building Ideas – An introduction to Architectural Theory; John Wiley & Sons Ltd. England.;2000
- Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994.
- Patrick Nuttgens,"The Story of Architecture FROM ANTIQUITY TO
- Simon Unwin, Analysing Architecture; Routledge Publicaions, Taylor and Francis. 2014.
- THE PRESENT", H.F.Ullmann Pub: 1983

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Origin of Architecture, Etymology of the Word 'Architecture'. Architecture as Identification of Place, Natural form, Man-made form, Fundamentals of Architecture, Architecture and culture- aspects of culture that influence architecture	6	15%
II	Elements that influence the architectural space, Rules of architectural geometry, Basic Elements of Architecture, Modifying Elements of Architecture, Geometry in Architecture, Principles of composition.	6	15%
FIRST INTERNAL TEST			
III	Analysis of artistic expression of architecture according to its medium, cultural and historical relevance through case studies. *Eg: Greek, Roman, Gothic, Renaissance, Japanese, Kerala etc.*	6	15%
IV	Meaning in Architecture – Architecture as Engineering (The technological revolution), Brief over view of evolution of construction over ages, Influential concepts in architecture.	7	15%
SECOND INTERNAL TEST			
V	Primitive Place Types , Vernacular architectural form and analysis- Analysis of a case study (sketching and description) eg: Kerala vernacular houses, Wattle and daub construction of Assam, Vernacular Houses of Sikkim Todahuts, Igloo, Turkish vernacular houses	10	20%
VI	Architecture and society, Great architects and their philosophy reflected in architecture – F L Wright, Le Corbusier, Walter Gropius, Louis Sullivan, Mies van der Rohe, Laurie Baker, Charles Correa, Geoffrey Bawa, etc.	10	20%
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
ES 101	THEORY OF STRUCTURES I	2-1-0-0	3	2016

Course Objectives

1. To develop an overall understanding and interest in structural system
2. To apply the principles of mechanics to practical engineering problems.
3. To introduce basic understanding of engineering structures and to explain effect of forces on various structural elements.
4. To develop simple mathematical model for engineering problems and carry out static analysis.

Syllabus

Historical evolution of structures - Walls, Post and beams, Arches, Vaults, Domes, Suspended structures, Truss, Sky scraper; Loads on structure as a whole - Dead Load - Live Load - Seismic Load - Wind Load - Tributary Load & load path. Basic concepts of Strength - Stiffness - Stability - Force types - Bending & Buckling

Force concepts - principle of transmissibility - resultant of co planar concurrent and non-concurrent forces - Varignon's theorem. Equilibrium conditions - free body diagrams Beams analysis - Support Reactions - Shear force and Bending moment diagrams of simple cases. Graphical method for analysis of truss.

Expected Outcome

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

- Differentiate the various structural elements in a building and types of loads acting on it.
- Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.
- Graphically analyze any type of determinate trusses with different end conditions.

Reference Books

- Babu, J., Engineering Mechanics, Pearson Prentice Hall
- Benjamin J., Engineering Mechanics, Pentex Book Publishers and Distributors
- Bhavikkatti, S. S., Engineering Mechanics, New Age International Publishers
- F.P. Beer & E.R. Johnston, "Vector Mechanics for Engineers", Tata McGraw Hill.
- G. G. Schierle, “Structure and Design”, Cognella Academic Publishing
- J.L. Meriam & L.G. Kraige, "Engineering Mechanics", John Wiley and Sons
- Kumar, K. L., Engineering Mechanics, Tata McGraw Hill Publishing Company Limited
- R.C. Hibbler, "Engineering Mechanics", Pearson Education, Asia Pvt. Ltd.
- Rajasekaran S. and Sankarasubramanian, G., Engineering Mechanics, Vikas Publishing House Private Limited
- R.K Bansal., Engineering Mechanics, Lakshmi Publications Pvt Ltd
- R.K Bansal., Strength of Materials, Lakshmi Publications Pvt Ltd
- S. Ramamrutham., Strength of Materials, Dhanpat Rai Publishing Company Pvt Limited

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Historical evolution- Walls, Post and beams, Arches, Vaults, Domes, Suspended structures, Truss, Skyscraper, Buttress	4	15%
II	Loads on structure as a whole - Introduction - Dead Load - Live Load - Seismic Load - Wind Load - Tributary Load & load path	5	15%
FIRST INTERNAL TEST			
III	Basic concepts of Strength - Stiffness - Stability - Force types - Force vs Stress - Bending & Buckling	4	15%
IV	Introduction: Force concepts - principle of transmissibility - system of coplanar forces - resultant of co planar concurrent and non-concurrent forces - Varignon's theorem. Equilibrium conditions - free body diagrams	10	15%
SECOND INTERNAL TEST			
V	Beams - support conditions - types Load types - Point load, uniformly distributed and varying loads Beam analysis - Shear force diagram - Bending moment diagram of simple cases such as: a) Cantilever beams with point loads, UDL & moment b) Simply supported beams with point loads, UDL & moment c) Simply supported overhanging beams (one side & both sides) with point load, UDL & moment	12	20%
VI	Simple plane trusses - different types of trusses Graphical method for analysis of truss.	10	20%
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
MA 103	MATHEMATICS	2-0-0-0	2	2016

Course Objectives

To understand and analyze Architecture, one needs the basic knowledge of the statistical methods available for calculating the Correlation coefficient and Probability distributions and their application along with various statistical methods of hypothesis testing. Mathematics and its application is required as a fundamental basis for equipping Architecture students with analytical, logical and practical skills required to be acquired by them to excel in design. Data and mathematical analysis works as essential tools to make the right decision in many practical situations.

Syllabus

Application of Measures of central tendency, Dispersion in statistics - Correlation coefficient- Probability distributions - important probability distributions and statistical tests for analysis of hypothesis.

Expected Outcome

By the end of the course the student is expected to built up the ability to

(i) learn about important statistical measures of central tendency and dispersion essential for data analysis.

(ii) learn about important probability distributions and important statistical tests of hypothesis based on it.

Reference Books

- B S Grewal, Higher Engineering Mathematics, Khanna Publishers (42nd edition), 2012
- Richard A Johnson, Probability and Statistics for Engineers(Miller and Freunds)- Prentice Hall of India, 8th Edition.
- S C Gupta and V K Kapoor , Fundamentals of Mathematical Statistics , S Chand Publications

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Statistics: Measures of central tendency- Mean-median-mode, Measures of Dispersion- Mean deviation-standard deviation-variance.	4	15%
II	Correlation coefficient- Regression lines- Method of least squares- Fitting of straight line and parabola.	4	15%
FIRST INTERNAL EXAM			
III	Probability distributions: Random variable- probability density function- probability distribution function- properties- Expectation of a random variable- Mean and variance.	5	15%
IV	Probability distributions: Binomial- Poisson- Normal.	5	15%
SECOND INTERNAL EXAM			
V	Testing of hypothesis: Sampling distribution- Standard error- Testing a hypothesis- Type I and Type II errors- Level of significance. Large sample tests: Test of significance for a single mean- Test of significance for difference of means.	6	20%
VI	Small sample tests: Student's t-distribution-Test of significance of a sample mean-Test of significance of difference between sample means.	6	20%
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
AS103	ARCHITECTURAL DRAWING & GRAPHICS I	1-0-0-3	3	2016

Course Objectives

To introduce students to the fundamental techniques of technical drawing.

Syllabus

Use and application of Scales. Orthographic projection of points, lines, planes, solids and combinations placed in different positions.
Section of solids, Intersection of surfaces, Development of Surfaces, Isometric projections, Perspective projections – One point, two point and three point.

Expected Outcome

Upon completion of the course, develop the necessary skills to analyze and solve basic problems involving graphics for architectural applications

Reference Books

- Cari LaraSvensan and William Ezara Street, 'Engineering Graphics'
- Bhatt,N. D., Engineering Drawing, Charotar Publishing House Pvt. Ltd.
- Rajaraman,S., Practical Solid Geometry.
- Varghese, P. I., Engineering Graphics, V.I.P Publishers.
- Venugopal, K., Engineering Drawing and Graphics, New Age International Publishers.

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	SCALES : Construction of plain scale and diagonal scale.	3	25%
	First angle projection Points and Lines: Orthographic projection of lines for any given condition, determination of true length ,traces and inclinations to the planes of projection of any given line. Planes: Traces of planes, plane figure inclined to one or both the reference planes.	8	
II	Orthographic Projection of Solids: Simple solids in simple position, prisms, regular pyramids, tetrahedron, octahedron, cone, spheres and their combinations placed in different positions. Section of solids: Section of simple solids by planes inclined. True shape of sections. Auxiliary projections of simple solids and their	10	25%

	combinations. Change of position and auxiliary plane method.		
FIRST INTERNAL TEST			
III	Intersection of surfaces : Line of intersection of two prisms, two cylinders and cone Development of surfaces: Development of surfaces of simple solids, prisms, cylinders, pyramids, cones, spheres and truncated solids.	12	25%
IV	Isometric Projection : Isometric scale, isometric view of planes , simple solids, truncated solids , combination of objects Perspective projection: Perspective projection of simple solids and their combinations by visual ray method and vanishing point method..	12	25%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS105	BASIC DESIGN	0-0-8-0	8	2016

Course Objectives

Introduction to architecture, primary elements and basic principles of design, and space articulation

Syllabus

An insight into concepts of architecture: space, form, enclosure, quality of space - Principles of design - harmony, symmetry etc. and their application- Elements of design, and Perception of space.
Design Parameters - anthropometrics - human activity and the use of space.
Interrelationship of architectural space to form, structure, and materials to help students develop a visual and tacit structural understanding through models and installations.

Expected Outcome

By the end of the course students will gain a fundamental knowledge of architecture and its principles

Reference Books

- Charles Wallschlaeger & Synthia Busic Snyder, Basic Visual Concepts & Principles for artists, architects &designers, McGraw hill, USA, 1992.
- Edward D.Mills - Planning the Architects Hand Book - Bitterworth, London,1985.
- Francis D.K.Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co.,(Canada),1979
- Owen Cappleman & Michael Jack Kordan, Foundations in Architecture: An Annotated Anthology of beginning design projects, Van Nostrand Reinhold, New York.
- Paul Laseau, Graphic Thinking For Architects and Designers, John Wiley & Sons, New York, 2001.
- V.S.Pramar,Design fundamentals in Architecture, Somaiya Publications Pvt.Ltd., New Delhi,1973.
- Wucius Wong, 'Principles of two Dimensional Design'

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to architecture: definitions of architectural terms Introduction to fundamental Elements of Design : Point, Line, Shape, Plane, Volume, Forms etc. Introduction to the principles of design – unity, balance, symmetry, proportion, scale, hierarchy, rhythm, contrast, harmony, focus, figure and ground	30	25%

	etc.		
II	Study of Forms : Solids and Voids, Planar, Fluid and Plastic Forms. Exploring Materials: Creating abstract sculptures out of Paper, Mount Board, Box Board, Metal Foils, clay, plaster and any other material and also analysing the adoptability of these sculptures to Architectural functions. Perception of colour and light. Exploring Colour Schemes based on principles of Harmony and Contrast and degree of Chromatism Application of colour on 3D models Minor projects: 2D compositions demonstrating principles of design Example: Compositions, Murals and Sculptures for Semi Recreational and Semi Functional Architectural Spaces.	30	25%
FIRST INTERNAL TEST			
III	Anthropometric studies – average measurements of human body in different postures, its proportion and graphic representation, application in design of simple household and street furniture. Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions	30	25%
IV	Application of Basic Design in Architecture Major project : Design of a simple architectural form based on an understanding of anthropometrics Example: Architectural spaces like children playing area, Exhibition Spaces, Outdoor Dining Area, Atrium or Courtyards, Outdoor Spaces, etc	30	25%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC 101	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES I	1-0-0-2	2	2016

Course Objectives

To introduce the elementary building materials and their applications.
To familiarize with contemporary as well as vernacular and traditional building materials.
To understand prevailing BIS specifications

Syllabus

Classification, properties and uses of Building materials:
Stone– Granite, Laterite, Slate, Marble.
Mud as a building material.
Clay: Clay as building material. Use of terracotta in construction as roofing and flooring tiles.
Brick country bricks & factory made -properties-available sizes-use
Mortar – lime mortar,mud mortar, cement mortar
Structural systems using bricks

Expected Outcome

1. Understand the application of stone and clay products in building construction.
2. Identify appropriate mortar mixes in various construction needs.

Reference Books

- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005
- Relevant BIS codes.
- Rosen Harold J, Construction materials for Architecture, Krieger Pub Co, 1992.

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Stone: Classification stones suitable for construction-properties-available sizes-use. Characteristic features and uses of Granite, Laterite, Slate and Marble *Exercise: Sketches related to stone and laterite masonry walls, foundation, ornamental work.*	12	25%
II	Clay: Clay as building material. Brick - country bricks & factory made bricks-properties-available sizes-uses. Terracotta-available forms suitable for construction-sizes-	11	25%

	properties-uses. Use of terracotta in construction as roofing and flooring tiles. Mud as building material- construction techniques of mud walls. Sand lime bricks – Manufacture and properties and use. *Exercise: Drawings -brick masonry, header and stretcher bond, one brick wall (English and Flemish bond), Sketches - ornamental brick bond*		
FIRST INTERNAL TEST			
III	Structural systems using bricks: Arches, vault, brick piers, brick footing, brick masonry - brick walls in English bond, and Flemish bond for one and a half walls, T junction and cross junction. *Exercise: Drawings- semicircular and segmental arch, brick vault, brick pier and footing, one and half brick wall in English bond, one and half brick wall in Flemish bond, cross junction, T -junction*	11	25%
IV	Ingredients of mortar- lime, cement and sand-proportions, - need for adding water, mortar types – mud mortar, Stabilized mud mortar, lime mortar, cement mortar - preparation techniques. Properties &applications. Comparison of lime mortar and cement mortar-advantages and disadvantages. *Exercise: Mortar - onsite experience – listing out observations.*	11	25%
SECOND INTENAL TEST			
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
AS 107	VISUAL ARTS AND THEORY	0-0-3-0	3	2016

Course Objectives

The objective of the course in Visual Arts is to make the students familiar with the basic principles and techniques of (a) Drawing (b) Painting and (c) Sculpture. The Course also will provide students a chronological introduction to the developments in the art and architecture of India.

Syllabus

Types, Characteristics and Functions of Lines, its Visual Impacts. Study of objects having varied shapes (Cuboid, Prismatic, Spherical, Globular, etc.,) in different media-Charcoal, Pastel, Pencil. Elements of Painting: Theory of Colour: Chromatic Values, Colour Wheel, Colour Chart. Two Dimensional and Three Dimensional aspects of Painting. Gestalt Theory. Introduction to Indian Aesthetics/Canonical Principles of Indian Art. Mural Tradition in Kerala- Study of Style, form and Texture. Graphic representations: Exercises involving logo design , Collage and Calligraphy. Methods and Techniques of Sculpture—Sculpture in shallow relief, Sculpture in round. Free standing sculpture in relation to Architectural space.

Expected Outcome

Art is an amalgamation of space, form, colour, texture etc., By studying art, the above said elements which are also the essential features in Architecture; the students get to establish their ideas in their architectural designing process.

Reference Books

- Francis D.K Ching, 'Drawing, Space, Form, Expression'.
- J.H.Bustano, by 'Principles of Colour and Colour Mixing'.
- Luis Slobodkin, 'Sculpture-Principle and Practice'.
- Roy C. Craven, 'Indian Art'.
- Suzanne Huntington, 'Art of Ancient India'.

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Drawing: Types, Characteristics and Functions of Lines, its Visual Impacts (Vertical, Horizontal, Diagonal, Zig-Zag, Curvilinear, Spiral etc.,)	10	20%
	Study of Objects: Study of objects having varied shapes (Cuboids, Prismatic, Spherical, Globular, etc.,) in different media-Charcoal, Pastel, Pencil.		
	Elements of Painting: Theory of Colour: Chromatic Values, Colour Wheel, Colour		

II	Chart.	12	30%
	Two Dimensional and Three Dimensional aspects of Painting. Gestalt Theory- Exercises based on above studies.		
FIRST INTERNAL TEST			
III	Introduction to Indian Aesthetics/Canonical Principles of Indian Art.	10	20%
	Mural Tradition in Kerala- Study of Style, Form and Texture.		
IV	Graphic representations: Exercises involving Logo Design , Collage and Calligraphy	13	30%
	Methods and Techniques of Sculpture—Sculpture in shallow relief, Sculpture in round. Free standing Sculpture in relation to Architectural space.		
SECOND INTENAL TEST			
END SEMESTER EXAM			

SEMESTER I

Course No.	Course Name	L-T-S-P/D	Credits	Year of introduction
PS 101	COMMUNICATION SKILLS AND TECHNIQUES	0-0-0-2	1	2016

Course Objectives

Focuses on the students' overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills will prepare students to adapt themselves with ease to the industry environment, thus rendering them as prospective assets to industries.

Syllabus

Listening Comprehension, Reading Comprehension, Speaking Skills, Resume / Report Preparation / Letter Writing, Preci writing, Presentation skills and Soft Skills

Expected Outcome

The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

Reference Books

- Anderson, P.V, Technical Communication, Thomson Wadsworth, Sixth Edition, New Delhi, 2007.
- Evans, D, Decision maker, Cambridge University Press, 1997.
- John Seely, The Oxford Guide to Writing and Speaking, Oxford University Press, New Delhi, 2004.
- Prakash, P, Verbal and Non-Verbal Reasoning, Macmillan India Ltd., Second Edition, New Delhi, 2004.
- Thorpe, E, and Thorpe, S, Objective English, Pearson Education, Second Edition, New Delhi, 2007.
- Turton, N.D and Heaton, J.B, Dictionary of Common Errors, Addision Wesley Longman Ltd., Indian reprint 1998.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Listening Comprehension: Listening and typing – Listening and sequencing of sentences – Filling in the blanks - Listening and answering questions. Reading Comprehension: Filling in the blanks - Close exercises – Vocabulary building - Reading and answering questions.	6	25%
II	Speaking: Phonetics: Intonation – Ear training - Correct Pronunciation – Sound recognition exercises – Common Errors in English. Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)	6	25%
FIRST INTERNAL TEST			
III	Resume / Report Preparation / Letter Writing /Preci writing Structuring the resume / report - Letter writing /Email Communication - Samples.	8	25%
IV	Presentation skills: Elements of effective presentation – Structure of presentation - Presentation tools– Voice Modulation – Audience analysis - Body language Soft Skills: Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity - Stress Management & Poise	10	25%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER II

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS 102	ARCHITECTURAL APPRECIATION	3-0-0-0	3	2016

Course Objectives

- To help students identify and appreciate Architecture as an outcome of social and cultural processes of a geographical locality.
- To promote the visual literacy level and prepare to appreciate the aesthetic components of art and architecture.
- To analyse architectural grammar, styles and practices in various cultural settings

Syllabus

Introducing the vocabulary of art and architecture constituted by elements and principles. Appreciating art and architecture through the study of modern movements in art and architecture. Understanding the social and cultural movements that shaped architecture of the past monuments and moments; memory and identity. Understanding architecture as a socio-cultural product with linkages to natural environment.
Introduction to the meaning, context, and significance of the elements and outcomes of designs in graphics, textiles, ceramics, sculpture, painting and printing as related to architecture.
Improvising the ability to understand, interpret and evaluate visual messages.

Expected Outcome

1. Students will be able to explain visual meanings, and understand the relationship of art and ar
2. Students will be able to critically analyse different art and architectural works.
3. Students will be able tounderstand the purpose and function of criticism.

Reference Books

- Amos Rapapport , House form and culture
- Don Norman, The Design of Everyday Things
- Emily Cole, The Grammar of Architecture
- Francis D.K. Ching, A Visual Dictionary of Architecture
- John Berger, Ways of Seeing
- Juhani Pallasmaa, The Eyes of the Skin: Architecture and the Senses, John Wiley & Sons, 2012
- James C. Snyder, Introduction to Architecture, McGraw-Hill, 1979
- Stephen Grabow, Kent Spreckelmeyer, The Architecture of Use: Aesthetics and Function in Architectural Design, Routledge, 2014
- V S Parmar , Social history of Indian architecture
- William Lidwell, KritinaHolden and Jill Butle, Universal Principles of Design

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Appreciating the Architectural vocabulary of buildings by identifying and understanding the elements (Point, line, shapes, form) of Architecture and Principles of Design(unity, variety, harmony, rhythm, balance, proportion, emphasis, contrast, movement)	5	15%
II	Architecture, society and culture. Case studies of buildings in local context to understand the impact of society and culture on built form.	5	15%
FIRST INTERNAL TEST			
III	Architecture and Human Behaviour Need for studying influence of architecture and human behaviour. Appreciation of architecture from user's perspective. Using the elements of architecture and principles of design to induce behaviour and emotion. Areas of application: Designing for social interaction, safety, privacy, etc. Designing for children – school, home, play. Designing for persons with physical challenges – visual, orthopaedic, etc.	8	15%
IV	Impact of Industrial Revolution on Architecture- The social, economic and political changes, affected, requirements of the society, new materials and technological development.	8	15%
SECOND INTERNAL TEST			
V	Appraisal of the early Movements in art and architecture: Early Modernism to Neo futurism. Chicago school, Bauhaus, De Stijl movement, Art Deco , Arts & Crafts and Art Nouveau.	6	20%
VI	Visual Literacy: Introduction to the meaning, context, and significance of the elements and outcomes of designs in graphics, textiles, ceramics, sculpture, painting and printing as related to Architecture. Understanding the relevance of symbols and images in architecture.	8	20%
	Appreciating a selected topic/building/product by writing a report	5	
END SEMESTER EXAM			

SEMESTER II

Course No.	Course name	L-T-S-P/D	Credits	Year of Introduction
EH 102	HISTORY OF ARCHITECTURE - I	2-1-0-0	3	2016

Course Objectives

History of Architecture is an online course that tries to create an appreciation of architectural developments in historical context in the minds of the students and guides them to explore the cultural and contextual determinants that produced a specific architectural vocabulary. It tries to understand architecture as a process, evolving within specific cultural contexts considering the aspects of politics, religion, society, climate, geography and also throws an insight into the development of architectural form with reference to technology, influences and character of built forms.

Syllabus

The relevance of learning history of Architecture. The inseparable component of history in Architectural development through ages. Development of Architecture and its relation to culture through the early periods, cultures - Prehistoric age, Ancient River Valley period, Pre Classical period, Aryan & Mauryan,
Classical period: Greece and Rome , Buddhist period

Expected Outcome

- By the end of the course the student is expected to build up the concepts of culture and civilization and their impact on architectural products.
- To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.
- To develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.
- To instill visual and formal analysis of architecture in the minds of students
- To enhance the sketching, written and communication skills of students.

Reference Books

- " A Global History of Architecture", Francis D K ching, Mark M. Jarzombek, Vikramaditya Prakash, Wiley Pub: 2010
- Leland M Roth; "Understanding Architecture: Its Elements, History and Meaning"; Craftsman House; 1994
- Lloyd S. and Muller H.W., "History of World Architecture – Series", Faber and Faber
- Patrick Nuttgens,"The Story of Architecture FROM ANTIQUITY TO THE PRESENT", H.F.Ullmann Pub: 1983
- Pier Luigi Nervi, General Editor, "History of World Architecture – Series", Harry N. Abrams, Inc. Pub., New York, 1972.
- Sir Banister Fletcher, "A History of Architecture", CBS Publications (Indian Edition),1999.
- Spiro Kostof, "A History of Architecture: Setting and Rituals, Oxford University Press, London, 1985.
- Vincent Scully, "Architecture – The Natural and the Manmade", Harper Collins Pub: 1991.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	A brief overview of Paleolithic and Neolithic Culture – art forms and evolution of shelter – megaliths – agricultural revolution and its impact on culture and civilization. Pre-Historic Civilization: Primitive man - shelters, settlements, religious and burial systems E.g.: Oval hut, Nice, Dolmen tomb, gallery grave, passage grave, Gobekli Tepe Temple, Catal Huyuk, Jericho, Jomon culture Stone Henge.	7	15%
II	Introduction to River valley cultures: generic forces shaping settlements and habitats: River valley culture: Indus Valley Civilization: Forces shaping settlements and habitats: Layout and Built forms of Mehrgarh, Early & Late Harappan & Mohenjodaro.	7	15%
FIRST INTERNAL EXAM			
III	River valley cultures: Mesopotamian civilization - Ziggurats at Warka, Ur and Chogha Zanbil, Palace of Sargon. Nile Valley Civilization (Egyptian): Old kingdom, middle kingdom - Mastaba Tombs, Pyramid of Cheops, Temple of Khons, Karnak, Temple at Abu Simbel	7	15%
IV	Greece - Pre-Classical Civilization Greek Language of Architecture – Palaces & Temples and their essential features. Geometry and Greek Architecture, Greek Capitals and Orders, Parthenon. Rome –Important Roman Cities Typical Roman house, Form Development of Roman vocabulary of Architecture, Structural and Engineering Feats Typology of buildings - Colosseum, Forums, Palaces Pantheon, Basilica. A Comparative study of Greek & Roman Culture & Architecture.	7	15%
SECOND INTERNAL EXAM			
V	Pre-classical Aryan & Mauryan : Vedic and Epic Age Salient features Vedic Village, Mauryan Empire – Architectural remains from Pataliputra, Asokan pillar at Vaishal, Lomas Rsi Cave Buddhism – Religion influencing Architecture – Buddhist Chaityas, Viharas, Stupa at Sanchi, Rock cut caves at Junnar, Chaitya hall at Bhajja	10	20%
VI	Introduction to Kerala Architecture: Evolution of architectural style, Factors that influenced the development of Kerala architecture: Materials, Climate & Socio-economic factors. Religious Architecture: Early Cave temples of Kerala, Early Hindu Temples, Churches and Mosques. Evolution of religious architectural forms.	7	20%
END SEMESTER EXAM			

SEMESTER II

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES 102	THEORY OF STRUCTURES II	2-1-0-0	3	2016

Course Objectives

- To develop an overall understanding and interest in structural system
- To calculate the sectional 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.
- To study the internal stresses (bending and shear stresses) in beams and strength of sections.

Syllabus

Truss analysis - Method of section and Method of joints; Centre of gravity - concept and definition - determination of Centroid of composite areas; Moment of inertia - definition - perpendicular axis theorem, parallel axis theorem - moment of inertia of composite areas; Simple stresses and strains - principle of super position - stresses in composite bars - elastic constants

Theory of simple bending, bending stresses in symmetrical beams, bending of composite beams; Concept of shear stresses in beams, distribution of shear stresses in symmetric cross sections

Expected Outcome

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

- Differentiate the various structural elements in a building and types of loads acting on it.
- Be familiar with the sectional properties of various sections
- Numerically analyze any type of determinate trusses with different end conditions

Reference Books

- A.P.Dongre – Structural Engineering for Architecture, Scitech Publications Ltd.
- Benjamin J., Engineering Mechanics, Pentex Book Publishers and Distributors
- Junarkar S. B. and Shah S. J., Mechanics of Structures (Vol. I), 30/e, Charotar Publishing House Pvt. Ltd., New Delhi, 2012
- Philip Garrison, “Basic Structures for Engineers and Architects”, Blackwell publishing
- Punmia B. C., A. K. Jain and A. K. Jain, Strength of Materials & Theory of Structures (Vol.I), Laxmi Publications, New Delhi, 2013.
- R.K.Bansal – A textbook on Strength of Materials Lakshmi Publications. Delhi 1998.
- Structure and Design by G. G. Schierle
- R.K Bansal., Engineering Mechanics, Lakshmi Publications Pvt Ltd
- S. Ramamrutham., Strength of Materials, Dhanpat Rai Publishing Company Pvt Limited
- Vaidyanathan R. and P.Perumal, Structural Analysis (Vol.I), Laxmi Publications, 2004

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Truss analysis - Method of section and Method of joints (cantilever and simply support trusses.)	6	15%
II	Centre of gravity - concept and definition - centre of mass - centroid - determination of Centroid of composite areas	6	15%
FIRST INTERNAL TEST			
III	Moment of inertia - introduction - definition and unit - perpendicular axis theorem, parallel axis theorem - moment of inertia of composite areas	6	15%
IV	Simple stresses and strains - types of direct stresses and strains - principle of super position - stresses in composite bars - elastic constants	6	15%
SECOND INTERNAL TEST			
V	Theory of simple bending (derivation not required), section modulus, bending stresses in symmetrical beams, bending of composite beams – simple problems	6	20%
VI	Concept of shear stresses in beams, distribution of shear stresses in symmetric cross sections (derivations not required)	6	20%
END SEMESTER EXAM			

SEMESTER II

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS104	ARCHITECTURAL DRAWINGS & GRAPHICS II	1-0-2-0	3	2016

Course Objectives

To introduce the Architectural Design Language – technical drafting and presentation.

Syllabus

Graphical Annotations and Symbols – Introduction of Architectural Drawings - Orthographic projections, Lettering - Dimensioning and Sciography - Architectural representation of different materials.
Measured Drawing - Building Drawing-
Architectural Presentation.

Expected Outcome

Upon completion of the course, the student shall have achieved a comprehensive understanding of technical drawing techniques and architectural presentation.

Reference Books

- Alexander W. White, 'The Elements of Graphic Design, Allworth Press; 1 edition (Nov 1, 2002)
- Cooper Douglas, 'Drawing and Perceiving', Van Nostrand Reinhold, 1992
- H.W. Janson – 'History of Arts, Prentice Hall' (Higher Education Division), Pearson Education,2002
- Mark A, Thomas, Poppy Evans, 'Exploring Elements of Design' 2 edition (August 15, 2007)
- Philip Meggs, 'A History of Graphic Design' John Wiley & Sons; 3 edition (September 9, 1998)
- Victor Perard, 'Anatomy and Drawing'

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**GRAPHICAL ANNOTATIONS AND SYMBOLS** Introduction to Architectural drawings using different mediums such as pencil, ink, types of papers, reproduction methods. Concept of orthographic projections, drawing conventions such as plan, elevation and section, symbols, lettering, dimensioning, values in drawn lines, tone, texture, color and light, sciography. Architectural representation of materials on drawings, terminology and abbreviations used in architectural drawings. Different types of lettering for titles and annotation of drawings.	15	25%
II	**MEASURED DRAWING** Use of scale in drawings, scaling and measuring of 3D forms and representing them in plan, elevations and sections using different scales. Reduction and enlarging of given drawings, tracing in pencil and ink medium. Measured drawing to scale of furniture pieces, rooms, doors, windows etc.	10	25%
FIRST INTERNAL TEST			
III	**BUILDING DRAWING** Drawing Plan, elevation, sections and details of buildings. Representation of wall thickness and openings in walls in plan and section. Measured drawing / documentation of small buildings / structures	10	25%
IV	**ARCHITECTURAL PRESENTATIONS** Rendering and presentation techniques with pencil and inks. Sciography, Perspective Views and Model Making	10	25%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER II

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS106	ARCHITECTURAL DESIGN I	0-0-8-0	8	2016

Course Objectives

To develop a basic understanding of space, form, structure and the built environment

Syllabus

Looking at the immediate built environment and understanding its fundamental components and their impact on the surroundings - Exploring personal experiences to behavioral needs and translating them into documented information that can be used as a basis for design - Presentation skills in the 2-D format - Systematic introduction to issues related to design, its components and space standards

Expected Outcome

By the end of the course students should have skills of drawing and representation; construction and structures to apply to basic design

Reference Books

- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997
- Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009.
- Francis D. K. Ching, ‘Architecture: Form, Space and Order’, John Wiley & Sons, 2007.
- Geoffrey Broadbent `Design in Architecture’ John Wiley and Sons, 1973.
- Neuferts' Architect's Data
- Simon Unwin, ‘Analizing Architecture’, Routledge, 2003
- Simon Unwin, ‘An Architecture Notebook Wall’ Routledge, 2000
- Simon Unwin, ‘Doorway’, Routledge, 2007

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Abstraction: Studying/analyzing manmade and natural forms/objects and copying or abstracting patterns and using the same to generate design for a product like chair, lampshade, pen stand etc	30	25%
II	Detailed study of spaces such as living, dining, bedroom, kitchen, toilet etc. including furniture layout, circulation, fixtures, openings, lighting, ventilation, orientation etc. Visual analysis of built forms, sculptural and spatial qualities, analysis of solid and void relationship Space/Building Appraisal: Analytical study of the interior spaces/ building forms and its critical appraisal of visual character Minor Project: Exercises on observation and visual perception	30	25%
FIRSR INTERNAL TEST			
III	Study of simple structural systems and behavior under load. Working model of structures (Like post and lintel, cantilever, trusses, arches, space frame, suspension etc), Development of basic skill in design expression, Visual analysis of built forms, sculptural and spatial qualities, analysis of solid and void relationship, Three dimensional projects developed through models and sketches	30	25%
IV	Integration of form and function in the design Major Project: Design of a basic shelter: an architectural form with a specific function, stressing on concept generation and development of rich design process. Example: phone kiosk, snack corner, ATM Center, security cabin, flower kiosk etc.	30	25%
SECOND INTERNAL TEST			
END SEMESTER EXAM : Jury			

SEMESTER II

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC 102	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES-II	1-0-0-3	3	2016

Course Objectives:
To introduce the elementary building materials and their applications.
To familiarize with contemporary as well as vernacular and traditional building materials.
To understand prevailing BIS specifications.

Syllabus
Timber – as Building material. Its classification, suitability for construction, seasoning.
Working with wood – Introduction to Carpentry, General Principles, Details of joints.
Bamboo as building material – characteristics, methods of joining and various applications.
Concrete – Ingredients, Grades, workability, Curing etc.

Expected Outcome:
1. Suggest applications of wood in construction industry.
2. Identify appropriate concrete mixes for various construction needs.

References:

- Gernot Minkev, Building with Bamboo, Birkhauser, 2012.
- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- Jules J.A. Janssen, Building with Bamboo: A Handbook , 1995.
- P.C. Varghese, 'Building Materials', Prentice hall of India Pvt Ltd, New Delhi, 2005.
- Relevant BIS codes.
- Rosen Harold J, Construction materials for Architecture, Krieger Pub Co, 1992.

Course Plan

Module	Contents	Hours	Sem. Exam. Marks
I	Timber: Use of wood in construction in various periods in history. Classification of Timber according to position of hard core – properties – available types of timber-suitability for construction – defects in timber – seasoning of wood – need for seasoning. Treated wood *Exercise: Sketches related to details of timber constructions.*	15	25%

II	Working with wood: Introduction to carpentry-General principles, Details of joints in wood –Doors – Windows – Furniture . Use of wooden members for various applications like structural systems *Exercise: Drawings - Timber joints, Panelled doors, sliding doors, glazed windows ,French windows, Bay Windows*	15	25%
FIRST INTERNAL EXAMINATION			
III	Bamboo: Bamboo as a building material-types-properties-application. Comparison of bamboo with wood. Working with bamboo: Various steps involved-required sizes of members-methods of joining bamboo for various applications. *Exercise: Drawings- Joining details of bamboo for various applications*	15	25%
IV	Concrete: Ingredients of plain cement concrete-grades-properties-applications and uses. Reinforced cement concrete water- cement ratio, workability, curing Various types of concrete in construction as Light weight concrete, Rapid setting concrete etc. *Exercise: concrete - onsite experience – listing out observations*.	15	25%
SECOND INTERNAL EXAMINATION			
END SEMESTER EXAMINATION			

SEMESTER II

Course No.	Course Name	L-T-S P/D	Credits	Year of Introduction
PS102	MODEL MAKING WORKSHOP	0-0-0-3	1	2016

Course Objectives

Improving the students' overall capability in model making that help them to translate their architectural ideas.

Syllabus

Material properties, Introduction to modeling with paper, paper board, plastics, plaster of Paris, wood and clay. Basic model making technique, different types of material and their techniques.

Expected Outcome

The course will equip the students with the necessary Model making skills that would help them in their architectural explorations.

References

- Roark T. Congdon, 'Architectural Model Building: Tools, Techniques & Materials' Bloomsbury Academic, 02-Apr-2010
- Wolfgang Knoll, Martin Hechinge , 'Architectural Models: Construction Techniques'

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Material explorations, Material Properties-Demonstrative Exercises	11	25%
II	Introduction to basic model making Tools-Technological tools {CNC,3d printing, Threading etc.}	11	25%
	FIRST INTERNAL TEST		
III	Geometric form exploration displaying various material Properties-Demonstrative Exercises	11	25%
IV	Free form exploration displaying various material Properties-Demonstrative Exercises	12	25%
	SECOND INTERNAL TEST		
	END SEMESTER EXAM		

SEMESTER III

Course no.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS201	CLIMATE AND BUILT FORM I	3-0-0-0	3	2016

Course Objectives

The objectives of the course are

- To provide a holistic understanding of climate in global context
- To understand the relationship between climate and human comfort.
- To expose the students to the various design strategies for buildings in different climatic zones.

Syllabus

A brief introduction to the global climate, components of climate, elements of climate and their measurements, Relevance of site and local climate in the design of built form, micro, macro and crypto climate, Study of urban and rural climate, Human heat balance and comfort, heat flow through buildings, Climate and Design of Buildings in Tropical Climates, Tropical climates and Climatic zones of India, classification, characteristics and design considerations.

Expected Outcome

Students will learn how to analyze climatic factors in relation to the human comfort.
Students will also learn how to implement climatic factors in the architectural design.

Reference Books

- Koenisberger, O. H., TG Ingersoll, Alan Mayhew, SV Szokolay, Manual of Tropical Housing and Building – Climatic Design, Orient Longman Pvt Ltd, Chennai, 2003.
- Konya Allan, Design Primer for hot Climates, The Architectural Press Ltd, London, 1980
- Baruch Givoni, Passive and low energy cooling of Buildings, John Wiley and Sons, 1994
- Thomas Andrew Markus, Edwin N. Morris, Buildings Climate and Energy, Pitman Pub., 1980.
- Fry. M and Drew. J, Tropical Architecture in the Dry and Humid Zones, Londres: Bestford, 1964
- Giovoni, B., Man, Climate and Architecture, Van Nostrand Reinhold, 1981
- Kukreja CP ,Tropical Architecture, Tata McGraw hill Pub. Co. Ltd New Delhi 1978
- Olgyay and Olgyay Solar Control and Shading Devices,

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Climate and Architecture: Climate, weather, components of climate, Global climatic factors and context, elements of climate, measurements and data representations, Global climate classifications (Koppen), Indian climate classification (SP 41)	8	20%
II	Site climate, Factors affecting site climate, Macro & microclimate, Urban and rural climate, Site analysis concepts.	6	15%
	FIRST INTERNAL EXAM		
III	Human heat balance and Comfort: Thermal comfort	8	20%

	factors, Physiological aspects, Body heat balance, comfort indices, comfort range and comfort charts (Psychrometric Chart, Bioclimatic Chart, ET and CET Nomograms).		
IV	Heat flow through buildings: Basic principles of heat transfer through buildings,Definitions – Conductivity, Resistivity, Specific heat, Conductance, Resistance and Thermal capacity – Surface resistance and air cavities – Air to air transmittance (U value), Sol air Temperature, Solar gain factor, Periodic heat flow, Time lag and decrement factor, Performance of different materials.	**10**	**25%**
SECOND INTERNAL EXAM			
V	Climate and Design of Buildings in Tropics: classification of tropical climates, characteristics of different climatic zones, Design considerations for warm-humid, hot-dry, composite and upland climates, Climate Responsive Design Exercises.	**8**	**20%**
END SEMESTER EXAM			

SEMESTER III

Course no.	Course Name	L-T-S-P/D	Credits	Year of Introduction
EH 201	HISTORY OF ARCHITECTURE - II	2-1-0-0	3	2016

Course Objectives

History of Architecture is an outline course that tries to create an appreciation of architectural developments in the minds of the students and guide them to explore the cultural and contextual determinants that produced a specific architectural vocabulary. It tries to understand architecture as a process, evolving within specific cultural contexts considering the aspects of politics, religion, society, climate, geography and also throws an insight into the development of architectural form with reference to technology, influences and character of built forms

Syllabus

A brief over view of Hindu Architecture –evolution of temple forms, Vesara and Dravidian Architecture – its development and culture, Indo Aryan - Earlier and later phases and architectural forms, Kerala Architecture.

Expected Outcome

By the end of the course the student is expected to understand the concepts of culture and civilization and their impact on architectural products.

To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.

To develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.

To instil visual and formal analysis of architecture in the minds of students

To enhance the sketching, written and communication skills of students.

Reference Books

- "A Global History of Architecture", Francis D K ching, Mark M. Jarzombek, Vikramaditya Prakash, Wiley Pub: 2010
- An Architectural survey of Temples of Kerala, Published by ASI, 1978
- A.Volwahsen, Living Architecture – India (Buddhist and Hindu), Oxford and IBM, London, 1969
- Brown Percy, Indian Architecture (Islamic Period) - Taraporevala and Sons, Bombay, 1983.
- Christopher Tadgell, The History of Architecture in India, Longman Group, U.K. Ltd., London, 1990
- Gateway to Indian Architecture, Guruswamy Vaidyanathan, Edifice Publication, 2003
- George Mitchell, Monuments of India, Vol I, Buddhist, Jain, Hindu; Penguin books, 1990
- Marian Moffett, Michael Fazio & Lawrence Wodehouse, A World History of Architecture, McGraw-Hill

- Percy Brown, Indian Architecture (Buddhist and Hindu period), Taraporevala and sons, Bombay, 1983
- Pier Luigi Nervi, General Editor, "History of World Architecture – Series", Harry N. Abrams, Inc. Pub., New York, 1972.
- Satish Grover, The Architecture of India (Buddhist and Hindu period), Vikas Publishing House, New Delhi 1981
- Satish Grover, The Architecture of India (Islamic) Vikas Publishing House Pvt. Ltd., New Delhi, 1981.
- Sir Banister Fletcher, A History of Architecture, Butterworth Heinemann (Hb), CBS (Pb), 1999.

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	A brief over view of Hindu Architecture - Hindu Temple planning, essential features, philosophy and ritual creating specific architectural vocabulary – Early shrines of the Gupta and chalukyan periods – Tigawa Temple, Ladh Khan and Durga Temple, Aihole, and Virupaksha Temples, Pattadakal.	6	20%
II	Vesara (mixture of the nagara and the dravida styles) Architecture – evolution, Chalukyas of Badami (500-753AD), Rashtrakutas of Manyakheta (750-983AD) in Ellora, Chalukyas of Kalyani (983-1195 AD) in Lakkundi, Dambal, Gadag etc. and Hoysala empire (1000-1330 AD). Early temples at Sirpur, Baijnath, Baroli and Amarkantak. The Hoysala temples at Belur, Halebidu and Somnathpura, Virupaksha Temple at Hampi and Pattadakal in northern Karnataka served as an inspiration for the design of the famous Khajuraho temples at Madhya Pradesh	6	20%
FIRST INTERNAL EXAM			
III	Dravidian Architecture : Dravidian culture and its relation to Architecture, Rock cut creations under Pallavas, Shore Temple, Mahabalipuram. Dravidian Order seen in Brihadehswara Temple, Tanjore, Meenakshi Temple, Madurai. Panchaprakara temple planning.	6	20%
IV	Indo Aryan - Salient features of Indo Aryan Temples. Examples - Lingaraja Temple, Bhuvaneswar; Sun temple, Konarak; Khandarya Mahadev temple, Khajuraho temple complex	8	20%

SECOND INTERNAL EXAM			
V	Climatic, Geographical, Geological, Cultural and religious factors that influenced Kerala Architecture – Salient features of domestic and religious Architecture of Kerala. Domestic Architecture – Palaces (Padmanabhapuram palace, Krishnapuram palace) Religious Architecture – Salient features of a Temple Cultural Architecture-temple theatres, Koothambalams Temple Architecture – Kaviyoor rock cut temple, Vadakkunathan temple, Sree padmanabhaswamy temple, Thirunakkara Temple,	9	20%
END SEMESTER EXAM			

SEMESTER III

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES201	THEORY OF STRUCTURES- III	2-1-0-0	3	2016

Course Objectives

1. To calculate deflection of beams.
2. To study the theory of columns and their modes of failure.
3. To understand the concept of indeterminate structures and their analysis.

Syllabus

Torsion – Concept of twisting of beams, torsion equation , torsional stresses in simple sections; Deflection in beams - Macaulay's Method – Moment area method ; Definitions of Columns & Struts – Long, Medium & Short columns – Effective Length – Slenderness Ratio – Critical load – Safe load — Different end conditions — Euler's formula for critical load —Assumptions and limitations — Strength of columns.

Consistent deformation method – fixed and propped cantilever ;

Analysis of continuous beams using Three moment theorem; Moment distribution method in Beams and Frames

Expected Outcome

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

- Understand the concept of twisting of beams
- Understand the behavior of structural elements under the action of vertical loads
- Analyse indeterminate beams and frames

Text Books

- R Junarkar S. B. and Shah S. J., Mechanics of Structures (Vol. I), 30/e, Charotar Publishing House Pvt. Ltd., New Delhi, 2012
- Junnarkar S. B. and H. J. Shah, Mechanics of Structures, Vol – II, 23/e, Charotar Publishing House, 2013.
- Punmia B. C., A. K. Jain and A. K Jain, Theory of Structures (SMTS- II), Laxmi Publications Pvt. Ltd., 2004.

References Books:

- Ramamrutham S. And R. Narayan, Theory of Structures, Dhanpat Rai Publishing Co., 2012
- R.K Bansal., Strength of Materials, Lakshmi Publications Pvt Ltd
- M.M. Ratwani & V.N. Vazirani, Analysis of Structures, Vol. 1, Khanna Publishers – Delhi, 1987.
- Timoshenko, S.P. and D.H. Young, Elements of Strength of Materials, Fifth edition, East West Press, 1993.
- A.R. Jain and B.K.Jain, Theory and analysis of structures, Vol. 1, Nemchand and Bros, Roorkee, 1987.
- R.K. Rajput "Strength of Materials", S.Chand & Company Ltd., New Delhi 1996.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Torsion – Concept of twisting of beams, torsion equation (derivations not required), torsional stresses in simple sections – simple problems. Deflection in beams - Macaulay's Method – Moment area method Conjugate beam method	8	20%
II	Definitions of Columns & Struts – Long, Medium & Short columns – Effective Length – Slenderness Ratio – Critical load – Safe load — Different end conditions — Euler's formula for critical load (derivations not required) — Assumptions and its limitations — Strength of columns	6	15 %
FIRST INTERNAL EXAM			
III	Determinate and Indeterminate beams.(Static Indeterminacy) - Consistent deformation method – fixed and propped cantilever Shear Force Diagram – Bending Moment Diagram	6	15 %
IV	Analysis of continuous beams using Three moment theorem Shear Force Diagram – Bending Moment Diagram, Support settlement case. (derivation not required)	6	15 %
SECOND INTENAL EXAM			
V	Introduction to slope deflection method-Beam only (settlement case not required.)Moment distribution methods – Beams Shear Force Diagram – Bending Moment Diagram, Beams.(without settlement case.)	6	15 %
VI	Moment distribution methods – Frame Shear Force Diagram – Bending Moment Diagram (Non-sway only.)	6	20 %
END SEMESTER EXAM			

SEMESTER III

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES 203	SITE SURVEYING AND ANALYSIS	1-2-0-0	3	2016

Course Objectives

The objectives of the course are

- To understand various techniques of site surveying.
- To learn the importance of site and its content in Building and Infrastructure Design
- To orient the students towards several influencing factors that governs the siting of building/buildings in a given site.

Syllabus

Definition of plot, site, land and region and types of Surveys- Instruments used- Methods and application- Site features, Infrastructure etc.-Contours, Methods of contouring, Grading process- Importance, procedure for making Survey drawings and dimensioning.
Setting out the plan on site – Procedure and Precautions.

Expected Outcome

The students are expected to learn various instruments used for surveying.
The students will able to conduct the Site analysis, process of slope analysis leading to the preparation of road layout and building layout
To familiarize students the use of all relevant instruments used for Surveying and to understand the techniques for preparation of measured drawings and setting out buildings on site.

Reference Books

- Duggal S.K., 'Surveying', Vol. I, Tata McGraw Hill Ltd, 1996
- Edward. T. Q. Site Analysis – Architectural Media, 1983
- John Ormsbee Simonds, Landscape Architecture, Fourth Edition: A Manual of Land Planning and Design
- Joseph De.Chiarra and Lee Coppleman - Planning Design Criteria - Van Nostrand
- Kanetkar and Kulkarni, 'Surveying and Levelling', Vol I, Pune VidyarthiGriha, 2008.
- Punmia B.C., 'Surveying and Levelling', Vol I and Vol II, Laxmi Publications Pvt Ltd, 2011.
- N. Madhu, R. Sathikumar, SatheeshGopi, Advanced Surveying: Total Station, GIS and Remote Sensing, Pearson Education India Publishers*2006*
- Shahani P.B., 'Surveying and Levelling', Vol I and Vol II, Oxford and IBH Publishing Company, 1971.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Definition of plot, site, land and region, units of measurements ,reconnaissance and need for surveying. Chain survey and Triangulation ,obstacles in chaining errors in chaining ,chaining on sloping ground and reciprocal ranging	**5**	**15%**
II	Introduction to compass survey ,bearings and angles, calculation of area by ordinate rule ,trapezoidal rule and Simpsons rule. Setting out the plan on site – Procedure and Precautions.	**7**	**15%**
FIRST INTERNAL EXAM			
III	Plane table surveying:Instruments used and methods, working operations in plane table surveying, two point problem and three point problem(mechanical method) Practical classes shall conduct for plane table surveying	**8**	**15%**
IV	Theodolite surveying :Instument used ,temporary adjustments. Measurement of horizontal and vertical angle, sources of errors in theodolite survey. Practicals shall be given on theodolite surveying .	**10**	**20%**
SECOND INTENAL EXAM			
V	Levelling : Principles of leveling; Study of instruments – Dumpy level and leveling staff, Temporary adjustments of level, Booking and reduction of levels – ‘ line of collimation method’ and ‘ rise and fall method’, Difficulties in leveling, Reciprocal leveling, Sources of error in leveling, Basic ideas on plotting of longitudinal and cross sections, Contouring – Contour interval – Characteristics, uses of contours. Practicals shall be given on leveling and a demonstration class shall be conducted for modern survey instruments	**10**	**20%**
VI	Advanced Surveying Instruments: Introduction to Global Positioning Systems (GPS), Total station survey , Distomat and theomat, Aerial photography, digital levels and auto levels	**5**	**15%**
END SEMESTER EXAM			

SEMESTER III

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS203	Architectural Design - II	0-0-9-0	9	2016

Course Objectives

To study about the spatial relationships and organization, form and space in the built environment.

Expected Outcome

By the end of the course students should assimilate learning of form development for a specific function and develop a sense of structure and enclosure.

Reference Books

- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997
- Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009.
- Francis D. K. Ching, ‘Architecture: Form, Space and Order’, John Wiley & Sons, 2007.
- Geoffrey Broadbent `Design in Architecture’ John Wiley and Sons, 1973.
- Neuferts' Architect's Data
- Simon Unwin, ‘Analizing Architecture’, Routledge, 2003
- Simon Unwin, ‘An Architecture Notebook Wall’Routledge, 2000
- Simon Unwin, ‘Doorway’, Routledge, 2007

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to minor project- Single use, single unit spaces such as cafeteria, prayer hall, cottage etc. – emphasising on form and space generation	40	40%
	FIRST INTERNAL TEST		
II	Introduction to major project –Major Project – Multi use, multifunctional spaces with horizontal development, interconnection between many spaces etc. Eg. Nursery school, Health clubs, clinics etc- Emphasising on spatial relationships and organization..	60	60%
	SECOND INTERNAL TEST		
	END SEMESTER EXAM		

SEMESTER III

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC201	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES-III	1-0-0-3	3	2016

Course Objectives:

To introduce the study of building materials, their applications and construction methods.
To familiarize the students with market study of building components and details.

Syllabus

Introduction to metals and their application in building construction:
Ferrous and non ferrous metals- study of products and profiles, metal fasteners and hardware.

Construction of Foundations:
Load bearing properties of different soils-Bearing Capacity, Safe bearing capacity and methods for improving it.
Site protection: Slope protection- Edge protection- Retaining walls- Materials & Methods.

Doors and window systems:
Study of different types of doors and windows based on the purpose, material, manufacturing process, opening mechanism etc, its advantages, disadvantages, durability and cost factor. Market surveys of door / window hardware – hinges, locks, latches, knobs, handles, door closers, gaskets etc. Site visits to see door/ window construction. Construction detail of swinging, folding and sliding doors. Construction details of aluminium and steel windows.
Glass and glazing:
Manufacture of glass, different glass products – sheet & non sheet, special purpose glasses, different types of glazing, market surveys

Expected Outcome:

1. Suggest applications of metal and glass in building industry.
2. Understand the construction details of foundations and Door/window system

References:

- Arthur Lyons, 'Materials for Architects and Builders', Elsevier Butterworth-Heinemann, 2004
- B McKay, 'Building Construction', Orient Longman 21, London, 1938-44.
- Francis DK Ching, 'Building Construction Illustrated' (4th edition), Wiley- India, New Delhi, 2012
- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- P C Varghese, 'Building Materials', Prentice Hall of India Pvt. Ltd, New Delhi, 2010.
- Relevant BIS codes.
- Barry, 'The Construction of Buildings (Vol. I-II)', 6th edition, Affiliated East-West Press Pvt. Ltd., New Delhi, 1996
- RC Smith & TL Honkala, 'Principles and Practices of Light Construction', Prentice Hall, Englewood Cliff, NJ 07632, 1986.
- Rosen Harold J, Construction Materials for Architecture, Krieger Pub Co, 1992.

Course Plan			
Module	**Contents**	**Hours**	**Sem. Exam. Marks**
I	**Ferrous and non ferrous metals:** Forms of iron employed in building construction-wrought iron, cast iron and steel-physical properties- uses. Types of steel employed in building construction- properties- uses. Hot rolled steel & cold rolled steel. Structural steel- Bi steel- Stainless steel- Coated steel- Properties & Use. Steel as reinforcement in RCC work: Types of reinforcement for concrete – standard forms - cutting, bending and placing of reinforcement. Aluminium in building construction- properties- advantages - available forms -casting, extrusion, foil, powder & sheet - uses- finishes - anodising, surface texture, colour coating & painting. Applications in buildings. *Study of available steel and aluminium products and profiles, in building construction, in the market. Site visits to study the aspects of steel reinforcement.*	**10**	**20%**
II	To study about construction of foundations Load bearing properties of different soils -Bearing Capacity, Safe bearing capacity and methods for improving it. Site protection: Slope protection- Edge protection- Retaining walls- Materials & Methods. Shallow foundations: Spread footings – strip footing, stepped footings, isolated footing. Continuous footing - Strap footing, Combined footing. Mat/ Raft foundation. Foundation walls – concrete foundation walls, concrete masonry foundation walls. Pole foundation and footing for wooden post and steel column. *Preparation of center line plan and site visit to study a building set out.* *Drawings: Strip footing, stepped footings, isolated footing, Continuous footing - Strap footing, Combined footing, Mat/ Raft foundation, RCC footing for wooden post and steel column.*	**20**	**30%**
FIRST INTERNAL EXAMINATION			

III	Doors and window systems Doors - Door types: Metal doors, metal framed doors, plastic doors & glass doors. Door frames: Rabbet frame, wrap around installation, butt frame installation. Door operation: Swinging, folding, sliding, revolving doors & coiling doors. Door designs: Hollow core & solid core, framed & frameless Special purpose doors: Fire doors Windows - Window types: Aluminum, Steel and plastic Window operation: Fixed, casement, awning & hopper, sliding, and pivoting. *Discussion: Comparative study of metal and plastic doors and window systems. Advantages, disadvantages, durability and cost factor.* *Exercise: Market surveys of door / window hardware – hinges, locks, latches, handles, door closers, etc. Site visits to see door/ window construction.* *Drawings: Construction detail of swinging, folding and sliding doors.* *Construction details of aluminum and steel windows.*	**20**	**30%**
IV	Glass and glazing Glass products : *Non sheet products* -Glass fibres, Cast glass, Cellular or foamed glass. *Sheet products*- Float glass, traditional blown & drawn glass, clear glass, patterned glass, wired glass. Heat strengthened glass- toughened glass, laminated glass Special purpose glasses- Low emissivity glass, Solar control glasses and variable transmission glass, Fire resistant glass, Self cleaning glass Glazing: Single, double and triple glazing Glazed curtain walls & sky lights. *Discussion: Use of Glass in different context, energy conservation and environmental impact.* *Exercise: Market surveys of glass products – sizes and cost. Collection of samples Glazing accessories.*	**10**	**20%**
SECOND INTERNAL EXAMINATION			
END SEMESTER EXAMINATION			

Semester III

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PS201	BUILDING SCIENCE LAB	0- 0- 0-2	1	2016

Course Objectives:

- To familiarize the students with building science, related parameters and its application in buildings.
- To understand various equipment and their principles for the determination of functional efficiency of buildings.
- To understand prevailing ISO Standards related to the above parameters.

Syllabus

Measurements of Air Temperature (indoor and outdoor), Relative Humidity (indoor and outdoor), Mean Radiant Temperature (MRT), Air movement indoors, Wind velocity outdoors, Solar Radiation, Surface Temperature and Thermal Insulation of materials.

Study of relationship between MRT and Solar Radiation, Study on comfort parameters and comfort indices, Evaluation of thermal comfort using Architectural Evaluation System, Measurement of illumination indoors – natural and artificial, Study of Sun path and shading devices.
Measurement of sound indoors and outdoors, Determination of acoustical properties of materials.

Non Destructive Tests for Concrete - Measurement of compressive strength of concrete using Rebound Hammer, Determination of cavities in concrete using Ultra Sound Method, Locating reinforcement bars embedded in concrete using Rebar Locator, Determination of degree of corrosion using Corrosion Analyser.

Expected Outcome:

- Acquire the concept of various parameters related to the functional efficiency of buildings and their measurements.
- Acquire knowledge in both the principles of equipment as well as the ISO standards.

References:

- BIS, "*SP 41: Handbook on Functional Requirement of Buildings*", BIS, New Delhi, 2005.
- David Egen, "*Architectural Acoustics*", J Ross Publishers, Canada, 2008.
- Givoni B, "*Man, Climate and Architecture*", Prentice Hall, New York, 1981.
- Laboratory Manual
- Martin Evans, "*Housing, Climate and Comfort*", Thames and Hudson, New York, 1984.
- Otto Koenigsberger *et al*., "*Manual of Tropical Housing and Building*", Orient Longman, India, 2003.
- Relevant Indian Standard Codes

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Measurements of Air Temperature (indoor and outdoor), Relative Humidity (indoor and outdoor), Mean Radiant Temperature (MRT), Air movement indoors, Wind velocity outdoors, Solar Radiation, Surface Temperature and Thermal Insulation of materials. *Exercise:*	**6**	**25%**
II	Study of relationship between MRT and Solar Radiation, Study on comfort parameters and comfort indices, Evaluation of thermal comfort using Architectural Evaluation System. Measurement of illumination indoors – natural and artificial, Study of Sun path and shading devices. *Exercise:*	**9**	**25%**
FIRST INTERNAL EXAMINATION			
III	Measurement of sound indoors and outdoors. Determination of acoustical properties of materials *Exercise:*	**6**	**25%**
IV	Non Destructive Tests for Concrete - Measurement of compressive strength of concrete using Rebound Hammer, Determination of cavities in concrete using Ultra Sound Method, Locating reinforcement bars embedded in concrete using Rebar Locator, Determination of degree of corrosion using Corrosion Analyzer. *Exercise:*	**9**	**25%**
SECOND INTERNAL EXAMINATION			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS202	CLIMATE AND BUILT FORM II	2-0-0-0	2	2016

Course Objectives

The objectives of the course are

- To understand the importance of adaptation of climate in building design.
- To recognize the conventional, vernacular, and traditional construction practices in tropics.
- To introduce modern tools and techniques in climatic design

Syllabus

Climate Responsive design in tropics, Active and Passive controls, Importance of Traditional architecture and its response to climate, Case studies to understand the vernacular influence and local architecture as response to climatic conditions with emphasis on Kerala Architecture, Sun and the design process, Natural ventilation and passive cooling in buildings, light and lighting systems, Climatic design using modern tools and techniques, a detailed appraisal of climatic performance of an existing built form

Expected Outcome

A holistic understanding of the influence of various climatic parameters on built form and the evolution of specific architectural styles to address sustainable and comfortable built environments in the tropics.

The students will learn methods to analyze the various elements of local climate and site.

Strengthening the conceptsto passively create comfortable built environments with knowledge of design strategies and its application.

Reference Books

- Richard Hyde, Climate Responsive Design – A study of buildings in moderate and hot humid climates, E & FN Spon, London and NewYork, 2005.
- Arvind Krishan, Nick Baker, Simos Yannas, S.V. Szokolay, Climate Responsive Architecture – A Design Handbook for Energy Efficient Buildings, McGraw Hill, New Delhi, New York etc., 2014.
- Bansal N.K. Minke.G, Climatic zones and rural housing in India, KFA, Julich, Federal republic of germany, 1988
- Fry. M and Drew. J, Tropical Architecture in the Dry and Humid Zones, Londres: Bestford, 1964
- Hassan Fathy, Natural Energy and Vernacular Architecture - Principles and Examples with reference to Hot Arid Climates, University of Chicago Press, Chicago and London, 1986.
- Koenisberger, O. H., Manual of Tropical Housing and Building. Part 1: Climatic Design, Orient Blackswan, 1975
- M.Rohinton Emmanuel, An Urban Approach to Climate-Sensitive Design – Strategies for the Tropics, Taylor & Francis, London & New York, 2005.
- Rapaport, A., House form and Culture, Engelwood Cliffs, NJ: Prentice-Hall, 1969.
- Baruch Givoni, Climate Considerations in Building and Urban Design, John Wiley & Sons, 1998..

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Climate responsive design in the tropics: Principles and its application; Active and passive systems. Learning from vernacular experience: Study of vernacular influence and local architecture as response to climatic conditions with emphasis on Kerala context, Case studies from India and various tropical countries.	**5**	**20%**
II	Sun and the design process: Movement of sun and solar geometry, Orientation for sun, Solar charts, Solar shading, Shadow angles, sun control, design of shading devices	**10**	**30%**
FIRST INTERNAL EXAM			
III	Natural ventilation and air movement : Air movement around and through buildings, Orientation for wind, stack effect, Induced ventilation.	**5**	**20%**
IV	Light and Lighting : photometric quantities, climate and light, basic principles of day lighting, daylight factor concept, daylighting in different climates, Supplementary artificial lighting, Glare in lighting design	**5**	**20%**
SECOND INTENAL EXAM			
V	Brief introduction to Energy modeling software and its application. Detailed appraisal/analysis of climatic performance of an existing residence or a workplace followed by redesigning or the same to improve climatic performance	**3**	**10%**
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
EH202	HISTORY OF ARCHITECTURE - III	2-1-0-0	3	2016

Course Objectives

History of Architecture is an outline course that tries to create an appreciation of architectural developments in historical context in the minds of the students and guides them to explore the cultural and contextual determinants that produced a specific architectural vocabulary. It tries to understand architecture as a process, evolving within specific cultural contexts considering the aspects of politics, religion, society, climate, geography and also throws an insight into the development of architectural form with reference to technology, influences and character of built forms..

Syllabus

Development of Architecture and its relation to culture through the periods Early Christian, Byzantine, Romensque, Gothic, Renaissance and their influence on Church Architecture of Kerala

Expected Outcome

- By the end of the course the student is expected to built up the concepts of culture and civilization and their impact on architectural products.
- To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.
- To develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.
- To instill visual and formal analysis of architecture in the minds of students
- To enhance the sketching, written and communication skills of students.

Reference Books

- Sir Banister Fletcher, A History of Architecture (Century Edition) / Butterworth Heinemann, CBS Publishers & Distributors,1999
- an Gympel, KONEMANN, The Story of Architecture FROM ANTIQUITY TO THE PRESENT.
- Pier Liugi Nervi, General Editor – History of World Architecture – Series, HARRY N.Abrams, Inc. Pub, New York, 1972.
- S.Lloyd and H.W.Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986.
- Spiro Kostof – History of Architecture – Setting and Rituals, Oxford University Press, London,
- A World History of Architecture / Marian Moffett, Michael Fazio & Lawrence Wodehouse / McGraw-Hill

- Encyclopedia of Architectural Technology / Ed: Pedro Guedes / McGraw-Hill
- CRASH COURSE IN ARCHITECTURE / Eva Howarth / Caxton Editions
- The Great Ages of World Architecture / G. H. Hiraskar / Dhanpat Rai
- The Civilization of the Renaissance in Italy, 1860, English translation, by SGC Middlemore, in 2 vols.,
- London, 1878)
- Erwin Panofsky, Renaissance and Renascences in Western Art, (New York: Harper and Row, 1960)
- Arnold Hauser, Mannerism: The Crisis of the Renaissance and the Origins of Modern Art, Cambridge:
- Harvard University Press, 1965, ISBN 0-674-54815-9
- Wolfflin, Heinrich (1971). Renaissance and Baroque. London: Collins.
- Stefan Muthesius (1994). Art, architecture and design in Poland, 966-1990: an introduction. K.R. Langewiesche Nachfolger H. Koster Verlagsbuchhandlung. p. 34. ISBN 3-7845-7611-7.
- Francis Ching, Mark Jarzombek, Vikram Prakash, A Global History of Architecture, Wiley Press, 2006.
- Jean-Francois Gabriel, "Classical Architecture for the Twenty-first Century", Norton, 2004

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Early Christian Architecture: Typology - Catacombs, earliest churches. Basilican church typology: planning, construction and other features. Old St. Peter's church.	**3**	**15%**
II	Byzantine Architecture: Centralized church typology: Spatial planning, construction and other features, Greek cross and Latin cross, knowledge of placing a dome over a regular polygonal plan with pendentives Example- Hagia Sophia, Constantinople. Old St. Peter's church.	**6**	**15%**
FIRST INTERNAL EXAM			
III	Romanesque - development of stone vaulting into groined systems – leading to – development of church plan Example - Detail study of the PISA CATHEDRAL WITH BAPTISTERY & CAMPANILE..	**9**	**15%**
IV	Gothic Architecture - Architectural background Characteristics of Gothic churches and cathedrals	**12**	**20%**

	Example - NOTRE DAME, PARIS		
SECOND INTERNAL EXAM			
V	Renaissance Architecture - Characteristics of Renaissance architecture Example - CATHEDRAL OF ST. PETER, ROME BAROQUE: Detail study of PIAZZA OF ST. PETER, ROME. Rococo –	**12**	**20%**
VI	Church Architecture in Kerala – St. Francis church, Fort Kochi, Our Lady of Life Mattancherry, Our Lady of Hope Vypin.	**9**	**15%**
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES202	THEORY OF STRUCTURES- IV	2-1-0-0	3	2016

Course Objectives

- To develop an overall understanding and interest in structural system
- To introduce the limit state design of RCC structures
- To enable the design of Reinforced concrete structural elements by limit state method.

Syllabus

Design philosophy of Limit state method - Design of singly reinforced beams under flexure and shear; Design of Doubly reinforced beams under flexure and shear; Slabs – Classification; Design of One Way slab under flexure and shear; Design of Two way slab under flexure and shear under both conditions of corners free to lift up and corners held down. Design of short column subjected to axial loads & combined axial load and uniaxial bending by limit state method; Footings- Types of footing, Design of isolated footings-Square and Rectangular shapes subjected to axial compressive load only.

Expected Outcome

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

- Understand design philosophies
- Analyse and design beams, slabs, columns and footings

Text Books:

- S.N. Sinha, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd.,New Delhi, 1998.
- Shah, Reinforced Concrete, Vol. 1 and 2 – Charotar Publishing House, Anand, 1998
- S. Unnikrishnan Pillai and Devados Menon, Reinforced Concrete Design – Tata McGraw Hill Publishing Co. Ltd., New Delhi, 1999.

References Books:

- P.Dayaratnam, Design of Reinforced Concrete Structures, Oxford and IBH Publishing Co., 1983.
- C. Sinha and S.K. Roy, Fundamentals of Reinforced Concrete, S.Chand & Co., New Delhi, 1983.
- Dr. B.C. Punmia, Reinforced Concrete Structures, Vol, 1 & 2 Laxmi publications, Delhi, 1994.
- IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
- SP -16 Design Aids for IS 456

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Design philosophy of Limit state method – Analysis and design of singly reinforced beams under flexure and shear by limit state method, Check for deflection, service ability**.**	**6**	**15%**
II	Design of Doubly reinforced beams under flexure and shear by limit state method, T-Beams and L-beams (analysis only)	**6**	**15%**
FIRST INTERNAL EXAM			
III	Slabs – Classification. Design of One Way slab under flexure and shear.	**6**	**15%**
IV	Design of Two way slab under flexure and shear with corners free to lift up and held down. Check for deflection.	**6**	**15%**
SECOND INTERNAL EXAM			
V	Design of short column subjected to axial loads. Column interaction curves. Design of column subjected to combined axial load and uniaxial bending by limit state method.[Use SP 16 Charts].	**6**	**20%**
VI	Footings-Types of footings. Design of isolated footings- Square and Rectangular shapes only - Subjected to Axial compressive loads.	**6**	**20%**
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES204	BUILDING SERVICES (PLUMBING AND SANITATION)	2-1-0-0	3	2016

Course Objectives

The course is to develop an understanding of fundamentals of environmental engineering-water supply and sanitary engineering-students will learn about sources of water, water treatment, waste water treatment, solid waste management etc.

Syllabus

Introduction, Water demand, demand forecasting, water quality, treatments and distribution of water. Waste water treatment, waste water disposal and solid waste management.

Expected Outcome

The students will be equipped with the basic technical knowledge regarding water demand of the community, various water treatments methods and distribution network. Students will be aware of the principles and best practices for Solid waste management in residential unit, small campus and for a large city.

References

- Birdie, G. S., and Birdie, J. S., Water Supply and Sanitary Engineering, Dhanpat Rai and Sons, New Delhi,2007.
- Duggal, K. N., Elements of Environmental Engineering, S Chand and Co. Ltd., New Delhi, 2008.
- Ehlers, V. M. and Steel, E. W., Municipal and Rural Sanitation, McGraw Hill, 2009.
- Ernest W. Steel and Terence J. Mc Ghee, Water Supply and Sewerage, McGraw Hill, New York, 1991
- Fair, Geyer and Okun, Water and Wastewater Engineering, John Wiley and sons, Inc., 2010
- Garg, S. K., Environmental Engineering, Vol. II, Khanna Publications, New Delhi, 2009.
- Kiely, G., Environmental Engineering, McGraw Hill, McGraw Hill, 2009.
- Mark J. Hammer and Mark J. Hammer Jr., Water and Waste Water Technology, Prentice Hall of India Pvt. Ltd. New Delhi, 2009.
- Metcalf and Eddy, Wastewater Engineering Treatment, Disposal and Reuse, Tata McGraw Hill, 2007.
- Modi, P. N., Sewage Treatment and Disposal and Wastewater Engineering, Standard Book House, New Delhi,2008
- Relevant BIS Codes.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**Introduction** Sources of water / hydrological cycle Quantity of water – factors effecting demand & consumption – population forecasting – Problems Quality of water – Drinking water standards – physical and chemical characteristics, of water.	**5**	**15%**
II	**Treatment & transmission of water** Processes involved – sedimentation, coagulation, filtration & disinfection, sedimentation tanks – slow sand filters, rapid sand filters Distribution system – gravitational, pumping and combined, intermittent and continuous system, Layout of distribution networks.	**7**	**20%**
FIRST INTERNAL EXAM			
III	**Wastewater** Wastewater characteristics – Types of oxygen demand **Waste water treatment** Preliminary treatment of wastewater – screens, grit chamber, detritus tank, sedimentation tank	**5**	**15%**
IV	**Biological & Anaerobic treatment** Activated sludge process, Trickling filter, Oxidation pond, chemical treatment, Anaerobic digesters, Septic tank and soak pit – Design. **Wastewater disposal** Disposal into land, water bodies, Stream, ocean - disposal by irrigation.	**7**	**20%**
SECOND INTERNAL EXAM			
V	**Solid waste management** Refuse collection, disposal, Incinerator, Composting, Vermi-composting, Sanitary Land filling, Bio gas system and Modern renewable energy system	**7**	**20%**
VI	Plumbing layout in residential, high raised building – documentation	**5**	**10%**
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS204	Architectural Design - III	0-0-10-0	10	2016

Course Objectives:
Introduction to issues related with the design of human habitat, its components and space standards. The objective of the studio will be on understanding residential spaces in a specific context.

Learning Outcomes
An understanding of user needs and how they translate into program and manifestation in design in terms of space, materials and construction methodology

Reference Books

- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997
- Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009.
- Francis D. K. Ching, ‘Architecture: Form, Space and Order’, John Wiley & Sons, 2007.
- Geoffrey Broadbent `Design in Architecture’ John Wiley and Sons, 1973.
- Neuferts' Architect's Data
- Simon Unwin, ‘Analizing Architecture’, Routledge, 2003
- Simon Unwin, ‘An Architecture Notebook Wall’Routledge, 2000
- Simon Unwin, ‘Doorway’, Routledge, 2007

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Study based on residential typologies. Exercises relating personal experiences to behavioural needs and translating them into architectural program requirements-emphasis on to issues related with the design of human habitat, its components and space standards. Emphasis on user needs and how they translate into design program.	50	40%
FIRST INTERNAL TEST			
II	Introduction to major project .Design of a simple building for residential use in the immediate or observable environment with a focus on program and use. Exercises relating personal experiences to behavioural needs and translating them into architectural program requirements- Data Collection, Case studies, Site studies, Analysis and Inferences- presentation of studies.	50	60%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC202	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES IV	1-0-0-3	3	2016

Course Objectives

- To introduce the study of building materials, their applications and construction methods.
- To familiarize the students with market study of building components and details.
- To understand conventional as well as vernacular and traditional building materials and practices.
- To understand prevailing BIS specifications.

Syllabus

Study of deep foundations – Construction details, building load factors, site visits
Wall systems – Metallic, wooden, concrete, masonry, steel systems
Floor systems – Concrete , steel and wood – structural systems, construction details, site visits
Plastics and Polymers – types of plastics, properties, application in construction, environmental issues, recycling, market study, Polymers- adhesives, sealants, building components.

Expected Outcome

- Comprehend the application and construction details of deep foundations, wall and floor systems
- identify the advantages and disadvantages of plastic and polymer

Reference Books

- Arthur Lyons, 'Materials for Architects and Builders', Elsevier Butterworth- Heinemann, 2004.
- Francis DK Ching, 'Building Construction Illustrated' (4th edition), Wiley- India, New Delhi, 2012.
- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- P C Varghese, 'Building Materials', Prentice Hall of India Pvt. Ltd, New Delhi, 2010.
- RC Smith & TL Honkala, 'Principles and Practices of Light Construction', Prentice Hall, Englewood Cliff, NJ 07632, 1986.
- Relevant BIS codes.
- R Barry, 'The Construction of Buildings (Vol. I-II)', 6th edition, Affiliated East-West Press Pvt. Ltd., New Delhi, 1996.
- Rosen Harold J, Construction Materials for Architecture, Krieger Pub Co, 1992.
- B McKay, 'Building Construction', Orient Longman 21, London, 1938-44.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**Study of deep foundations.** Pile foundation: Bearing piles, friction piles – concrete, timber, steel and composite piles. Cased and uncased cast in situ concrete piles, Bored piles, pressure piles and precast concrete piles. Screw piles & disk piles. Under reamed piles. Bored compaction piles. Sand piles. Sheet piles. Pile cap. Caissons: Box caissons, Open caissons & pneumatic caissons *Discussion: Building load-factors, soil condition, need for deep foundations, stability of buildings.* *Exercise: Site visits and case study of deep foundation construction shall be done.*	**10**	**20%**
II	**Wall systems.** Structural frames, bearing walls, metal and wood stud walls. Concrete columns, concrete walls, precast concrete walls panels and columns, tilt-up construction. Masonry walls unreinforced and reinforced, solid walls and cavity walls, masonry columns and pilasters, lintels and sunshades, IS Codes Structural steel framing, steel columns, light gauge steel studs, balloon framing. Wood stud framing, stud wall sheathing, wood columns, wood post and beam framing, Kerala traditional wooden wall systems. Partition wall systems. Glass block walling system. *Discussion : Aspect ratio and stability of walls* *Exercise: Documentation of Kerala Traditional wooden wall systems.* *Drawings: Precast concrete walls and connections.RCC lintels and sunshades, Structural steel framing. Wood stud framing.*	**20**	**30%**
FIRST INTERNAL TEST			

III	Floor systems Concrete, Steel and Wood Concrete: One-way slab, One-way joist slab, Two-way slab, Two-way slab and Beam, , Pre cast construction, Alternative technology. Steel: One-way beam system, Two-way beam system, Triple beam system, Moment connections, Shear connections, Semi rigid connections, Open- web steel joists, Metal decking, Light-gauge steel joists. Wood: Wood joists, Wood joist framing, wood beams-supports and connections, plank and beam framing. Kerala traditional floor system construction. *Discussion:* *Basic load bearing concepts of floor systems.* *Exercise:* *Site visits to study shuttering and placement of reinforcement for concrete floors and beams.* *Drawings:* *Reinforcement details of one way slab and two way slab with beams. Open web steel joist framing. Metal decking. Wood joist framing.*	**20**	**30%**
IV	**Plastics and Polymers.** Introduction, Polymerisation, Polymer types, Properties of plastics. Plastics in construction, Plastic-environmental issues, recycling of plastic. Polymers- adhesives, sealants, building components. *Discussion:* *Discuss the advantages and disadvantages of using plastic in building construction.* *Exercise:* *Market study and sample collection of plastic building materials and components.*	**10**	**20%**
SECOND INTENAL TEST			
END SEMESTER EXAM			

SEMESTER IV

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PS202	ARCHITECTURAL SOFTWARE TRAINING	0-0-0-2	1	2016

Course Objectives

To develop awareness and familiarity with Computer applications in architecture.
To introduce students to the various skills and techniques required in using Computers as a digital media for design.
To Serve as a platform for further advancement in the field of computer aided design.

Syllabus

Part 1 : Introduction to personal computers – hardware / software – operating system – important DOS commands
Part 2: Windows basics introduction to CAD packages-Setting up & controlling the AutoCAD or similar drawing environment – Creating & Editing Commands. Organizing a drawing with layers – Advanced geometry editing – Creating & using Blocks – Inquiry Tools – AutoCAD Design Center. Text annotation – Creating & Customizing Hatch patterns – Productive Dimensioning – Defining Text & Dimension Styles Printing & plotting - creating a slide presentation – Drawing utilities – importing / exporting files.
Part 3: Understanding 3D coordinate system - Using View ports – 3D drawing & Editing commands – Interactive Viewing in 3D-Surfacing in 3D, working with advanced surfacing commands – Solid modeling – Advanced solid modeling commands – Editing Solids Introduction to rendering in 3D – Rendering process. Additional software are Tumbler Sketch up and Rhino
Part 4: Enhancing digital images from CAD application using Adobe Photoshop, Paint Shop Pro & other graphic programs.
Part 5: Introduction to BIM and the use of appropriate software like AutoCAD, Revit, ArchiCADetc, for modeling of buildings.

Expected outcome

- Students will be familiar with various advanced computer applications used for Architectural design.
- A basic understanding of various parameters of Computer application should enable students to improve further through their architectural design projects.

Reference Books

- Alexander C. Schreyer, 'Architectural Design with SketchUp: Component-Based Modeling, Plugins, Rendering, and Scripting', John Wiley & Sons, 20-Nov-2012.
- Broad bent, 'Design in Architecture', Wiley International
- Brad Dayley, Danae Dayley, 'Adobe Photoshop CS6 bible'
- Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston, 'BIM handbook: a guide to building information modeling for owners, managers, designers, engineers and contractors : 2nd edition'
- James Vandezande , Eddy Krygiel, 'Mastering Autodesk Revit Architecture 2016'

Autodesk Official Press 1st Edition.

- Mitchell, 'Computer Aided Architectural Design', Van Nostrand
- Omura George, "Mastering AutoCAD (Release 14)", BPB Publications, New Delhi, 1997.
- Synder, James, "Architectural Construction Drawing with AutoCAD R14", John Wiley, New York, 1998.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Introduction to personal computers – hardware / software – operating system – important DOS commands Windows basics introduction to CAD packages-Setting up & controlling the AutoCAD or similar drawing environment – Creating & Editing Commands. Organizing a drawing with layers	**5**	**25%**
II	Advanced geometry editing – Creating & using Blocks – Inquiry Tools – AutoCAD Design Center. Text annotation – Creating & Customizing Hatch patterns – Productive Dimensioning – Defining Text & Dimension Styles Printing & plotting - creating a slide presentation – Drawing utilities – importing / exporting files	**8**	**25%**
FIRST INTERNAL TEST			
III	Understanding 3D coordinate system - Using View ports – 3D drawing & Editing commands – Interactive Viewing in 3D-Surfacing in 3D, working with advanced surfacing commands – Solid modeling – Advanced solid modeling commands – Editing Solids Introduction to rendering in 3D – Rendering process. Additional software are Tumbler Sketch up and Rhino	**10**	**25%**
IV	Enhancing digital images from CAD application using Adobe Photoshop, Paint Shop Pro & other graphic programs. Introduction to BIM and the use of appropriate software like AutoCAD, Revit, ArchiCAD etc., for modeling of buildings.	**7**	**25%**
SECOND INTENAL TEST			
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS301	LANDSCAPE ARCHITECTURE	2-2-0-0	4	2016

Course Objectives

The objectives of the course are

- To introduce the students about the site planning and landscape architecture and imbibe the importance of Integration of landscape design with architectural design.
- To evolve an understanding of sustainable site development addressing the functional, aesthetic and environmental issues.
- To understand Principles of landscape design, its techniques and application

Syllabus

Brief Understanding of Natural resources, Introduction to Landscape Architecture, and its significance in architecture. Relevance of Site analysis and site planning in sustainable architecture. Elements and principles of landscape design and their application in outdoor space design; Historical and contemporary attitudes to landscape in Indian and other context. Introduction to storm water drainage, & grading. Landscape construction details of steps, ramps, parking, pools etc. Preparing landscape design presentation drawing (using symbols etc).

Expected Outcome

Site planning process and its significance; establishing relationship between site characteristics and design requirements.
Understanding the role of elements and application of principles in the landscape design of outdoor environments on the site.
Building on the inventory of knowledge of theory of landscape architecture and awareness through understanding of development of landscape design and gardens till the early 19th century including colonial landscape in India.
Understanding the techniques and criteria for grading and construction of simple structures.
Application of the knowledge of site planning and landscape design will helps to address the environmental issues.

Reference Books

- Bose, T.K. and Choudhary, K.Tropical Garden Plants in Colour. Horticulture and Allied Publishers. 1991.
- Dee, C. Form and Fabric in Landscape Architecture: A visual introduction, UK: Spon Press.2001.
- Hackette Brian.Planting Design,NY: McGraw Hill Book Co. Inc. 1979
- 2001Jellicoe, G. & Jellicoe, S. The Landscape of Man, London: Thames and Hudson. 1991.
- Laurie, M. An Introduction to Landscape Architecture, NY: American Elsevier Pub.Co Inc.1975.
- Lyall S. Designing the New Landscape. UK: Thames & Hudson. 1998.
- Lynch, K. Site Planning, Cambridge: The MIT Press. 1962
- McHarg I. Design with Nature. NY: John Wiley & Co. 1978.
- Motloch, J. L. Introduction to Landscape Design, US: John Wiley and sons.
- Simonds, J.O. Landscape Architecture: The Shaping of Man's Natural Environment, NY: McGraw Hill Book Co. Inc. 1961.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Brief Understanding of Natural resources; Introduction to Landscape Architecture, definitions, importance, need and scope; Role of landscape design in architecture Site Studies and Site Planning ; Site suitability analysis. Case studies of energy efficient site planning and site development in India.	**9**	**10%**
II	Elements & Principles of Landscape Design –Natural elements (Landform, water, plants) and manmade elements (hard areas, paths, street furniture, terraces etc) , Tangible/intangible elements; Types of plant materials; Understanding the visual (colour, form, texture) characteristics and also the non□visual characteristics (smell, touch, sound)of these elements and their usage to achieve the functional, aesthetic and environmental goals.	**12**	**20%**
FIRST INTERNAL EXAM			
III	The role of plant material in environmental improvement, (e.g. soil conservation, modification of microclimate). Planting for shelter, windbreaks and shelter belts. Principles of landscape design (harmony, balance, contrast, etc.). Surfacing, enclosure vistas, visual corridor, composition of plant and other material, etc.	**6**	**15%**
IV	Changing perceptions of man's relationship with nature till the early 19th century; Ancient Heritage: Mesopotamia, Egypt, Greece, Rome ;Western Civilization: Europe; Italy, France, and England The middle-east: The Persian tradition and its far reaching influence Eastern Civilization: China and Japan. Ancient and medieval period in India; Mughal and Rajput Landscapes; Colonial landscape development in India (Lutyens Delhi). Contemporary attitudes to landscape in Indian and other context.	**12**	**20%**
SECOND INTENAL EXAM			
V	Landscape Engineering Introduction to grading, landform modifications and surface water drainage. Earth form grading; basic grading principles, cut and fill processes, Retaining walls; Surface Drainage: understanding drainage.	**9**	**15%**
VI	Landscape Construction: Factors in relation to systems, structures and materials for Circulation: Roads and Parking, paths and plazas. Level Change: Wall, steps and ramps Planting: Planters, beds, edges and terraces. Water elements: Pools and water bodies	**12**	**20%**
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
EH 301	HISTORY OF ARCHITECTURE - IV	3-0-0-0	3	2016

Course Objectives

History of Architecture is an outline course that tries to create an appreciation of architectural developments in historical context in the minds of the students and guides them to explore the cultural and contextual determinants that produced a specific architectural vocabulary. It tries to understand architecture as a process, evolving within specific cultural contexts considering the aspects of politics, religion, society, climate, geography and also throws an insight into the development of architectural form with reference to technology, influences and character of built forms.

Syllabus

Development of Architecture during the Islamic period

Expected Outcome

By the end of the course the student is expected to built up the concepts of culture and civilization and their impact on architectural products.

To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.

To develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.

To instill visual and formal analysis of architecture in the minds of students

To enhance the sketching, written and communication skills of students.

Reference Books

- Architecture of the Islamic World - George Michell - (its history and social meaning), Thames and Hudson, London, 1978.
- Brown Percy, Indian Architecture (Islamic Period) Taraporevala and Sons,Bombay, 1983.
- Islamic Architecture, Form, Function and Meaning, Robert Hillenbrand, Edinburgh University Press,1994.
- R. Nath – History of Mughal Architecture – Abhinav Publicaitons – New Delhi, 1985
- Satish Grover, The Architecture of India (Islamic) Vikas Publishing House Pvt.Ltd. New Delhi,1981.
- Sir Banister Fletcher,A History of Architecture, University of London,The Antholone Press,1986.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**ISLAMIC ARCHITECTURE – IMPERIAL -** Evolution of Islamic religious architecture in India ISLAMIC ARCHITECTURE – IMPERIAL - Influences on Islamic Architecture , Salient features of a mosque Example – Qutb Minar, ,Delhi.in Qu-at ul islam mosque complex Varieties of squinch Architectural Development under the kings of the Khalji - Example - Alai Darwaza Tughlaq dynasty - Tomb of Ghiasuddin Tughlaq Khirki Masjid – Shish gumbad & Purana Quila, Delhi	**8**	**10%**
II	ISLAMIC ARCHITECTURE – PROVINCIAL - Architectural Development of the provincial styles in regions of –Punjab, Bengal, Gujarat, Deccan Example of Punjab style – Tomb of shah Rukni Alam – Example of Bengal style – Chota sona masjid.Gaur Example of Gujarat style – Jami masjid,Ahmedabad Examples of Deccan style – Golgumbaz,Bijapur, & Charminar, Hyderabad	**10**	**20%**
FIRST INTERNAL EXAM			
III	ISLAMIC ARCHITECTURE – Tughlaq, Sayyid and Lodi dynasty – Forms of Tombs Example – Tomb of Sher Shah Suri, Tombs of Sayyid dynasty, Tombs in Lodi Garden.	**6**	**10%**
IV	Islamic Architecture – MUGHAL Development of the Mughal style under the different rulers - Babur, Humayun, Akbar, Jahangir Important examples –Humayun's Tomb,Delhi, Fatehpur Sikhri (lay out, Buland darwaza, Diwani Khas,) Akbars Tomb at Sikandara	**9**	**20%**

SECOND INTERNAL EXAM			
V	**Islamic Architecture - EARLIER PHASE** Development of the Mughal style under the different rulers - Shahjahan, Aurangazeb - Tomb of Salim Chisti & Jami masjid The Taj Mahal, Agra – Red Fort, Delhi (Diwan-i-Am, Rang Mahal). Study of (a) RED FORT emphasising planning & design of the DIWAN-I-AM; and, (b) the TAJ MAHAL emphasising on both TOMB and GARDEN, Charbag system	**12**	**20%**
VI	Masjid – Juma Masjid Thazhathangadi, Muchundi mosque in Kuttichira, Miskal masjid, calicut	**12**	**20%**
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES301	THEORY OF STRUCTURES- V	2-1-0-0	3	2016

Course Objectives

- To introduce the design of various timber components in a building.
- To enable the understanding of the types, efficiency and strength, advantages and disadvantages of Rivet and welded joints in steel.
- To enable the design of Tension (beams) and compression (columns) steel members in a building under various conditions

Syllabus

Introduction to steel sections – Design of Connection; Design of tension member – plate, single angled member; Compression member – single angled strut; Introduction to built up column, Design of laterally restrained beams; Design of Column Bases; Introduction to timber beam and flitched timber beam; Types of Flitched Beam -Design of flitched timber beam; Design of timber column - Slenderness Ratio -Built up column

Expected Outcome

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

- Understand design philosophies
- Analyse and design steel tension and compression members
- Analyse and design timber structures.

Text Books:

- A.S.Arya, Structural Design in Steel, Masonry and Timber, Nemchand and Bros, Roorkee, 1971.
- Dayaratnam.P, Design of Steel Structures, Oxford and IBH Publishing Co.
- Gurucharan Singh, Design of Steel Structures, Standard Publishers, New Delhi, 1982.
- IS 883 – Code of Practice for Design of Structural Timber in Buildings
- IS 800 – Code of Practice for use of Structural Steel in General Building Construction Tayal, A. K., Engineering Mechanics- Statics and Dynamics, Umesh Publications
- National Building Code of India, 1983, Part VI, Structural Design.
- L.S. Negi, Design of Streel Structures – Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
- S. Ramachandra, Design of Steel Structures - Standard Book House, Delhi, 1984.
- Design of Steel Structures by N.Subramanian
- Limit State Design of Steel Structures S.K Duggal

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Introduction to steel sections –Material Property, Stresses ,Types of Connection, Analysis and Design of Bolted and Welded Connection(Moment Connection not required).	**6**	**15 %**
II	Design of tension member – plate, single angled member, Compression Member-Design of Strut-normal sections, single angled section.	**6**	**15 %**
FIRST INTERNAL EXAM			
III	Solid and Built –up Columns for axial load-battens and lacing (Only theory is required). Design of laterally restrained beam	**6**	**15 %**
IV	Column Bases-Design of Column bases	**6**	**15 %**
SECOND INTERNAL EXAM			
V	Introduction to timber beam ,Types of timber – Classification, allowable stresses-Design of beams-flexure ,shear, bearing and deflection considerations	**6**	**20 %**
VI	Flitched timber beam- Types of Flitched Beam-Design of flitched timber beam, Design of timber column	**6**	**20 %**
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES303	BUILDING SERVICES (ELECTRICAL AND LIGHTING)	2-0-0-0	2	2016

Course Objectives

To introduce students to electrical services and illumination and to sensitize them with respect to their integration into Architectural Design.

Syllabus

Introduction, Basics of electricity, Electrical installations in buildings, Indian electricity rules, Electrical wiring design, Load calculation, Illumination and lighting, Lighting and electrical scheme.

Expected Outcome

The students will be equipped with the basic technical knowledge regarding the subject, present trends in design and sustainable practices.

References

- Aly.S.Dadras, Electrical systems for Architects
- H.Cotton ,Electrical Technology
- L.Uppal , Electrical wiring, Estimating and Costing
- Lighting Manual
- Marc Schiler, Simplified design of building lighting
- National Electrical Code
- Raina& Bhattacharya, Electrical Wiring, Design and Estimation

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Basics of Electrical systems Introduction to electrical services, commonly used terminology. Single and three phase supply. Supply and distribution of electricity to buildings- Transformer, Substations, Main and distribution boards	4	10%
II	Electrical installations in buildings Electric meter, Main switch, Panel board, Circuit breaker, fuses, Switch gear and switch boards Earthing for safety – types, ISI specifications Lightning protections	4	15%
FIRST INTERNAL TEST			

III	Introduction to Indian electricity rules. Electrical wiring design Electrical wiring system in domestic and commercial buildings- Conduits, types of wiring, Devices (switches and Outlets) Electrical load calculations Exercise in load calculation.	**4**	**15%**
IV	Illumination and lighting Commonly used terms in illumination. Laws of illumination, Measurement of luminous flux and lux meter Lighting systems for building Natural/ Artificial Direct/Indirect General/ Local Light sources (Incandescent, Fluorescent, HID, HPS and LPS, LED) and Luminaries Day lighting and day lighting factor.	**5**	**20%**
SECOND INTERNAL TEST			
V	Lighting design and calculation Local/general lighting calculation-Lumen method Criteria and standards for different purpose/activity illumination- Residence, Office, Institution, Hospital and commercial display lighting.	**5**	**20%**
VI	Outdoor lighting – Street and flood lighting (Sports stadia) Swimming pool lighting and underwater luminaries. Energy efficient lighting and LEED certification. Alternative energy sources Preparation of lighting scheme as a part of assignment.	**5**	**20%**
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS303	ARCHITECTURAL DESIGN - IV	0-0-10-0	10	2016

Course Objectives:
The objective of the studio is to introduce students to the site and context as prime generators of design decisions.

Learning Outcomes:
Ability to interpret site information as a decision-making aid.

Reference Books

- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997
- Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009.
- Francis D. K. Ching, ‘Architecture: Form, Space and Order’, John Wiley & Sons, 2007.
- Geoffrey Broadbent `Design in Architecture’ John Wiley and Sons, 1973.
- Neuferts' Architect's Data
- Simon Unwin, ‘Analizing Architecture’, Routledge, 2003
- Simon Unwin, ‘An Architecture Notebook Wall’Routledge, 2000
- Simon Unwin, ‘Doorway’, Routledge, 2007

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Study on site planning and landscape- students may be assigned topics related to the same and make detailed reports and presentations. Focus will be on the site and context and their relationship to the built environment. Activities, services and construction methods, phenomena of social utilizations, growth and change shall also be studied and analysed.	**40**	**50%**
FIRST INTERNAL TEST			
III	Introduction to major project – Projects may be on recreation, assembly, convention, institution/education use etc.. Emphasis on the site and context as prime generators of design decisions.	**60**	**50%**
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER V

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC301	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES -V	1-0-0-3	3	2016

Course Objectives

To introduce the study of building materials, their applications and construction methods.
To familiarize the students with market study of building components and details.
To understand conventional as well as vernacular and traditional building materials and practices.
To understand prevailing BIS specifications.

Syllabus

Wood Substitutes

Vertical Transportation Systems: stairs, step ladders, ladders, elevators and escalators – types, planning aspects, components, construction details,

Roof Systems - Flat roof, Sloping roof and Curved roof - types, terminology, components, construction details, Roof cover – various options

Applied finishes - Wall finishes: Mortar & Plaster, Paints, Distempers and varnishes – Types, Composition, application. Wall cladding – types and it application

Expected Outcome

1. Design buildings with more than one floor
2. Identify different roofing systems and roof covers used in construction industry

Reference Books

- Arthur Lyons, 'Materials for Architects and Builders', Elsevier Butterworth-Heinemann, 2004.
- Francis DK Ching, 'Building Construction Illustrated' (4th edition), Wiley- India, New Delhi, 2012.
- Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- P C Varghese, 'Building Materials', Prentice Hall of India Pvt. Ltd, New Delhi, 2010.
- R Barry, 'The Construction of Buildings (Vol. I-II)', 6th edition, Affiliated East-West Press Pvt. Ltd., New Delhi, 1996.
- RC Smith & TL Honkala, 'Principles and Practices of Light Construction', Prentice Hall, Englewood Cliff, NJ 07632, 1986.
- Relevant BIS codes.
- Rosen Harold J, Construction Materials for Architecture, Krieger Pub Co, 1992.
- W B McKay, 'Building Construction', Orient Longman 21, London, 1938-44.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**Wood Substitutes**. Industrial products as substitutes for natural hard wood. Characteristics, physical properties, areas of application, available forms and sizes of: Veneers and veneer ply woods, particle board, hard board, fiberboard, block board, lamina-boards, glulam, laminates, cement particle board, e-board, bamboo ply, etc. *Site visit: Industries of Wood substitutes* *Exercise: Market survey of wood substitutes.*	**10**	**20%**
II	**Vertical Transportation Systems.** Study the various means of vertical transportation such as ramps, stairs, elevators and escalators. Planning of vertical transportation systems – design parameters. **Ramps**: Planning of ramps, slope, finishes, safety precautions and need for constructing ramps. **Stairs:** Planning staircases - Standards, rules and regulations. Components of stairs. Stair plans- stairs with straight, circular and curved flights. Construction details of Wood stair, fire escape stairs, Concrete stair, Steel stair and Composite stair. **Elevators:** Planning and grouping of elevators. Elevator design parameters. Quality of elevator service. Different types of elevators – passenger elevators, observation elevators, hospital elevators and freight elevators. , travelators .Vertical transportation system in skyscrapers. **Escalators**: Planning and details of escalators. Comparison with elevator in terms of its use. *Discussion: Recent developments in vertical transportation.* ***Drawings: RCC and Composite Staircase, Elevator (Passenger) and escalator.***	**20**	**30%**
FIRST INTERNAL TEST			
III	**Roof Systems.** Introduction to roof systems of buidings. Flat roof, Sloping roof and Curved roof. Deciding the slope or curvature of roof. Wooden rafter framing: Roof terminology. Different types of rafter framing and their construction details. Wood trusses. Construction details of joints and	**20**	**30%**

	connections of members.Construction details of traditional wood roofs of Kerala. Structural Steel roof framing: Steel rigid frames, Different types of Steel trusses and their construction details. Construction details of joints and connections of members. Introduction to Space frames and Composite roof systems *Discussion: Planning a good roof system. Use roof systems to cater certain functional needs including environmental control.* *Exercise: Documentation of traditional roof systems of Kerala.* *Drawings: Steel and Composite roof systems*		
IV	**Applied finishes - Wall finishes**. Mortar & Plaster: Cement mortar, lime plaster and gypsum plaster. Fire resistant plaster, X-Ray shielding plaster and acoustic plaster. Plaster lath and accessories. Plaster over masonry and ceiling. Paints, Distempers and varnishes: Characteristics of an ideal paint. Classification – various types of paints, their characteristics and purpose. Composition of paints. Painting process. Application of paints. Defects in painting works. Wall cladding- stone cladding, tile cladding, and metal cladding. Stucco finish. *Discussion: Applied finishes and building maintenance.* ***Exercise: Market survey of materials for applied finishes.***	**10**	**20%**
SECOND INTENAL TEST			
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS 302	HISTORY OF ARCHITECTURE - V	3-0-0-0	3	2016

Course Objectives

History of Architecture is an outline course that tries to create an appreciation of architectural developments in historical context in the minds of the students and guides them to explore the cultural and contextual determinants that produced a specific architectural vocabulary. It tries to understand architecture as a process, evolving within specific cultural contexts considering the aspects of politics, religion, society, climate, geography and also throws an insight into the development of architectural form with reference to technology, influences and character of built forms.

Syllabus

Development of Architecture during Industrial revolution, Modernism, Arts and Crafts Movement, Post modernism, works of Indian Masters and Contemporary trends in Indian Architecture.

Expected Outcome

By the end of the course the student is expected to built up the concepts of culture and civilization and their impact on architectural products.

To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.

To develop an understanding of architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.

To instill visual and formal analysis of architecture in the minds of students

To enhance the sketching, written and communication skills of students.

Reference Books

- Aldo Rossi, L'architettura della città (1966), translated as The Architecture of the City by Diane Ghirardo and Joan Ockman. Cambridge, MA: MIT Press, 1982
- Charles Jencks, The Language of Post-Modern Architecture, 1984.
- Christopher Alexander, Pattern Language, Oxford University Press, Oxford- 1977.
- Diane Ghirardo, Architecture after Modernism, Thames and Hudson, London, 1990.
- Filippo Tommaso Marinetti, "The Futurist Manifesto" (1909) in Ulrich Conrads, Programs and Manifestoes on Twentieth-Century Architecture (Cambridge, MA: MIT

Press, 1970)

- Giulio Carlo Argan, "On the Typology of Architecture," (1963) in Kate Nesbitt, Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, 1965- 1995 (New York: Princeton Architectural Press, 1996
- Jane Jacobs, The Death & Life of Great American cities, Random House Inc, 1961
- Joan Ockman, "Introduction," Architecture Culture 1943-1968: A Documentary Anthology. Edited by Joan Ockman with the collaboration of Edward Eigen (New York: Rizzoli, 1993)
- Kate Nesbitt, "Introduction," Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory, 1965-1995 (New York: Princeton Architectural Press, 1996)
- Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London, 1994.
- K. Michael Hays, "Introduction," Architecture Theory Since 1968 (New York and Cambridge: Columbia Books of Architecture/MIT Press, 1998)
- Krysta Sykes, "Introduction," Constructing a New Agenda: Architectural Theory, 1993-2009, edited by A. Krysta Sykes (New York: Princeton Architectural Press, 2010)
- Le Corbusier, Vers une architecture (1923), translated as Towards a New Architecture (New York: Dover, 1986
- Michael Hays, "Afterword," Constructing a New Agenda: Architectural Theory, 1993-2009, edited by A. Krysta Sykes (New York: Princeton Architectural Press, 2010)
- Philip Johnson and Mark Wigley, Deconstructivist Architecture. New York: Museum of Modern Art and Boston: Little, Brown, 1988)
- Robert Venturi, Complexity and Contradiction in Architecture,The Architectural Press, London, 1977.
- Vikram Adhitya Praksh, Chandigarh's Le corbusier, The Struggle for Modernity in Post colonial India, Mapir Publishing, 2002

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Architectural developments and impacts on society since Industrial revolution- Examples- crystal palace, Eiffel tower Arts & Crafts movement; Art nouveau, eclecticism, and the works of Horta, Gaudi Organic Architecture -Early works of F.L.Wright.	**6**	**10%**
II	Modern Architecture. Emergent new building / space types- structural engineering, standardization-Industrial exhibitions- Chicago School and skyscraper development.	**6**	**10%**
	FIRST INTERNAL EXAM		
III	Futurism, Expressionism works of Mendelson &Taut, Cubism, Constructivism, De stijl and their influence on Architecture. Bauhaus school & Walter gropius, Modernism and the International style.	**6**	**10%**
IV	Works of national and international architects; international styles, post modernism, deconstruction in architecture. Post modernism - Cesar Pelli, Mario Botta, Frank Gehry, Santiago Calatrava Historic revivalism - Hassan Fathy - Laurie Baker- Critical Regionalsim - Geoffrey Bawa – Kenneth Yeang. Tadao Ando Deconstructivism – Zaha Hadid, Daniel Libeskind, Peter Eisenman - Modern and High tech – Richard Rogers, Renzo Piano, Norman Foster, Richard Meier, Paulo Soleri	**12**	**20%**
	SECOND INTERNAL EXAM		
V	Works of the Indian masters - Chandigarh and Bhubaneshwar experiments - Influence of Le Corbusier, Louis Khan, Koeninsberger - Works and ideas: Nari Gandhi – B.V.Doshi – AchyutKanvinde – Charles Correa – Padmasree Laurie Baker - Joseph Allen Stein	**10**	**20%**

VI	CONTEMPORARY TRENDS IN INDIAN ARCHITECTURE - Works and ideas: AnantRaje – Uttam Jain –Raj Rewal – Hasmukh Patel – Bimal Patel - CNT, Karan Grover, SenKapadia, Gerard da Cunha, Rahul Mehrotra, Nimishpatel, Christopher Charles Benninger,	**12**	**20%**
END SEMESTER EXAM			

SEMESTER VI

Course no.	Course Name	L-T-S-D	Credits	Year of Introduction
PE 362	Elective I VERNACULAR ARCHITECTURE OF KERALA	2-0-0-0	2	2016

Course Objectives

The major objectives are to understand the process of creation of vernacular architecture specific to a region, to create an understanding about the social and physical environment, climate of the place, materials and methods of construction which gave birth to that specific vernacular architecture and to identify and learn about the cornucopia of vernacular architectural heritage of our country.

Syllabus

A brief over view of the process of creation of vernacular architecture, its cultural and contextual responsiveness, its determinants, role of social, cultural, political, economic, symbolic, climatic, technological contest in creation of form, different approaches and concepts to study of vernacular architecture, and the specific vernacular architectural forms in the northern and southern parts of India.

Expected Outcome

By the end of the course the student is expected to understand vernacular architecture as a process and not a product and explore the concepts of culture and civilization and their impact on these architectural products.

To develop an understanding of vernacular architecture as an outcome of various social, political and economic influences and as a response to the cultural and climate conditions.

To develop an understanding of the physical experience of buildings in order to appreciate the complexity of the physical and metaphysical influences bearing on architecture.

Reference Books

- Amos Rapoport, House, Form & Culture, Prentice Hall Inc. 1969.
- Architecture Without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky
- Carmen Kagal, VISTARA – TheArchitecture of India, Pub: The Festival of India, 1986.
- G.H.R. Tillotsum – The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.
- Handmade Houses and Other Buildings The World of Vernacular Architecture By John May,,2010, Thames & Hudson
- Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.
- R W Brunskill: Illustrated Handbook on Vernacular Architecture, 1987.
- S. Muthiah and others: The Chettiar Heritage; Chettiar Heritage 2000
- Vernacular Architecture: An Illustrated Handbook By R.W. Brunskill, 4th ed 2000 Faber and Faber

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Introduction - Definition and classification of Vernacular architecture – Meaning & theories - it's nature, purpose and scope - salient features and important contributions in evolving workable solutions- Cultural and contextual responsiveness of vernacular architecture: an overview .	**4**	**10%**
II	Vernacular architecture as a process - Determinants of vernacular architecture: Role of social, cultural, political, economic symbolic, climatic, technological contest in creation of form – Survey and study of vernacular architecture: methodology.	**6**	**20%**
FIRST INTERNAL EXAM			
III	Study of vernacular architecture as a process and not a product -The process of recording, categorizing and dissemination of information about vernacular architecture, through both graphic and written mediums- Different approaches and concepts to study of vernacular architecture: an over view – Aesthetic, Architectural and anthropological studies in detail.	**6**	**20%**
IV	Building materials and construction techniques, art & crafts, the local conditions, traditions, climate &geography, religion & culture in the period when they were built. Suitable Case studies.	**4**	**10%**
SECOND INTERNAL EXAM			
V	Understanding how the social and physical environment, climate of the place, materials and methods of construction impact vernacular architecture. Forms, spatial planning, cultural aspects, symbolism, colour, art, materials of construction and construction technique of the vernacular architecture of the following: Havelis of Rajasthan, wadas of Maharastra, wooden houses of Himachal Pradesh etc.	**5**	**20%**
VI	Cultural aspects, forms, spatial planning, Architectural morphology, symbolism, art, colour, materials of construction and construction technique, proportioning systems, religious beliefs and practices in the vernacular architecture in the regions of Kerala and Tamilnadu. Agraharams of Kerala and Tamilnadu, Vernacular houses and townscapes in Kerala.	**5**	**20%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PE 364	Elective I PINCIPLES OF HUMAN SETTLEMENTS	2-0-0-0	2	2016

Course Objectives

To give an insight to the students about understanding and analyzing the evolution of habitat through in various stages of human history. The course tries to lay a foundation for a general understanding of Human Settlements through analyzing the fundamental elements that has molded the very existence of human race made possible by a habitat. This course should become a prelude to learning the Sustainability, Planning and Urbanization of modern settlements.

Syllabus

Origin of Habitat - Etymology of the Word 'Settlement', understanding settlement as Identification of habitat–Environment and Culture –land and material - Principles Guiding modern settlements – Programs for alleviation and demography.

Expected Outcome

By the end of the course the student is expected that the students acquire a basic understanding of the spatial quality, the modifying factors and perception to express habitat as a basic element of human life.
To instill visual and formal analysis of habitat in the minds of students.
To enhance the perceptive skills of students in understanding the basic elements.

Reference Books

- C.A. Doxiadis, Ekistics: An introduction to the Science of Human Settlements (Oxford University Press, London, 1968)
- Cities in A Globalizing World – Global Report on Human Settlements 2001: by United Nations
- House Form and Culture (Foundations of Cultural Geography) Paperback – by Amos Rapoport
- The Vancouver Declaration on Human Settlements by United Nations : 1976

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	History and evolution of human settlements Period, environmental factors, form, size and materials used. Settlement patterns of Mesopotamia, Indus Valley, Mayan _ renaissance period, Industrial revolution and post war Era (world war –I)	5	15%

II	Evolution of Human settlements as a subject The Vancouver Declaration on Human Settlements "Ekistics" and the contribution of C.A.Doxiadis, case study and application in analysis	**4**	**25%**
FIRST INTERNAL TEST			
III	Post Industrial Developments Urbanization and change in form – Planned cities, Slums, services and theories _ concentric zone, sector, multiple nuclei etc	**5**	**20%**
IV	Types of settlements _ Rural, Urban etc. Effects of various parameters in built environment: Economics _ Cost – land & material relation, Land suitability and availability of services, cost effective building technology Building energy modeling and its effect in design parameters	**7**	**15%**
SECOND INTERNAL TEST			
V	Settlement pattern Demographic pattern and analysis of census and its effect in Settlement pattern of Kerala.	**5**	**15%**
VI	Various schemes by various agencies for betterment of settlements _ISUDP, Jnnurmetc	**4**	**10%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year Of Introduction
PE 366	Elective I INTERIOR DESIGN	2-0-0-0	2	2016

Course Objectives

- To introduce students to the design of interior spaces
- Provide a basic understanding of the various realms of Interior Design and the specific skill sets required.
- To instruct on the construction and fabrication systems employed in contemporary interior design profession
- To make students aware of the relevance of sustainable best practices in design

Syllabus

- Introduction to the fundamentals in Interior Design.
- Materials, Construction & Fabrication
- Professional practice in Interior Design.
- Sustainability

Expected Outcome

By the end of the course, the student will be able to :

- Summarize the fundamentals of Interior Design.
- Comprehend the relationship between spaces, design elements and human perception in terms of volume, form, colour and texture.
- Familiarize with the technical terms, processes and practices used in the Interior Design profession and understand their application.
- Understand and apply the principles of design, detailing and work out the basic costing of all the works under the scope of an interior designer

Reference Books

- Allison, Diana, Estimating and Costing for Interior Designers: A Step-by-Step Workbook, Fairchild Books, 2014
- Bapat S. V., Basic Design & Anthropometry, Pratima Bapat, Pune, 1993.
- Bapat S. V., Living Areas – Internal Spaces, Pratima Bapat, Pune, 1993.
- Barratt K., 'Logic and Design: In Art, Science & Mathematics, Design Books, 2005
- Ching F. D. K., Interior Design Illustrated , John Wiley, 2012.
- Ching , F. D. K., Architecture - Form, Space & Order, Van Nostrand Reinhold Inc., 1996
- Halse A. O., Use of Colours in Interiors, McGraw Hill, 1968.
- Moxon Sian, Sustainability in Interior Design, Laurence King Publishing, 21March 2012
- Pickering E., Architectural Design, John Wiley, 1933.
- Plunkett Drew, Construction and Detailing for Interior Design. Laurence King 2010, 2015
- William McDonough & Michael Braungart, Cradle to Cradle: Remaking the Way We Make Things,North Point Press, 2002
- Winchip Susan M, Sustainable Design for Interior Environments, Fairchild Publications

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**ID Theory: Elements of 2D & 3D design:** Space as raw material. Qualitative & quantitative study. Application of design principles in interiors- order, growth, division, sequence & scale. Surfaces- Functions of surfaces. Floors, walls, ceiling, dividers. Elements of visual composition- space, surfaces and visual relationships.	**4**	**10%**
II	**Materials, Color, Light, Texture:** Various materials like wood, stone, fabric, and finishes like paint, wall paper, murals etc and their properties and application. Surface texture & patterns Space and color. Color wheel, color psychology & cultural meanings. Interior lighting. Various functions of lighting. Human factors and relationship between color, finish/texture and lighting and how light modulates perception of colour, texture and form.	**4**	**10%**
	FIRST INTERNAL EXAM		
III	**Introduction to Furniture, Fittings & Equipment's in Interior Design** Furniture- types of furniture based on function, design and materials. Introduction to ergonomics. Furnishings- Soft furnishings: textiles & fabrics, various furnishings-types and functions. Types and various design variations in furnishing item – bed, sofa, cushion, curtains & trimmings, carpets, rugs etc. Incorporating natural elements in interiors- use of water, air & natural light in interiors. Interior plantscaping and current trends. Market survey of materials	**6**	**25%**
IV	**Document preparation in Interior Design:** Tendering documents in Interior Designs- contents and purpose. Typical presentation & rendering techniques in Interior Design- Mood-boards, finishes' boards, interior perspectives and sketches. Drawings- Working drawings & Shop drawings. Detailed drawings/detailing	**6**	**20%**
	SECOND INTERNAL EXAM		

V	**Quantification and costing in Interior Design:** Overall costing of Interior projects based on drawings and specification sheets Quantification and costing of Wall and floor coverings – paints, wallpaper, carpets/rugs etc Quantification and costing of curtains & trimmings. Quantificationand costing of material required for furniture like sofa, cushions etc Quantificationand costing of Accessories & Hardware –Functional & decorative accessories, ironmongery etc Quantification and costing of equipments required in specific areas like kitchen.	**6**	**25%**
VI	**Interior Design Professional Practice & Sustainable Best Practices through case studies** Sustainable Design, Innovation & Best practices. Environmental design & sustainable design practices. Reduce, reuse & recycle in interior design. Innovation and research in materials and technology. Case studies of innovation and sustainable furniture design, lighting design & furnishings	**4**	**10%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PE 368	**Elective I Tropical Architecture**	**2-0-0-0**	**2**	**2016**

Course Objectives

To understand the need for a climate responsive architecture.
Find the balance between globalization and local identity.
Familiarize the student with the various vernacular and contemporary climate-related designs around the world that has a lot of useful application and meaning.

Syllabus

Tropical climate, Building in the tropics, Relationship between nature and built form - Architecture in the tropics, Examples of climatic design in various tropical countries, Warm humid Tropical climate with special reference to Kerala . Climatic conditions and analysis.
Study of vernacular influence and local architecture as response to climatic conditions

Expected Outcome

Describe the terms of Tropical Architecture in a broad sense and able to provide such proper examples of Tropical Buildings; Describe all important elements which form Tropical Building; Explain all physical comforts required in Tropical Building; Synthesis design concepts of Tropical Building which meet human comfort requirements.

Reference Books

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- Barreneche, R. A. Tropical Modern Thames and Hudson, London 2003
- Fry, M. and Drew, J., Tropical Architecture in the Dry and Humid Zones. Londres: Bstford, 1964
- Geoffrey Bawa , The Complete Works, David Robson, 2002
- Giovoni, B. Ma, Climate and Architecture, 2 nd edition. Barkingg, Essex: Applied Science, 1976
- Koenisberger, O. H., Manual of Tropical Housing and Building.
- Lippsmeier, G., Building en the Tropics, Munich: Callwey, 1969
- Made Wijaya, Architecture of Bali-A Sourcebook of Traditional & Modern Forms, 2011

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Tropical climate, environmental consequences of tropical climate – Building in the tropics - Urban heat island phenomenon: UHI classification, causes, urban geometry, mitigation strategies, UHI in tropics, case studies	**5**	**15%**
II	Thermal comfort in the tropics – Bio climatic needs of humans- comfort indices for the tropics: ET, SET, PMV Comfort Temperature, adaptive comfort standard – Thermal comfort in the urban outdoors, outdoor comfort indices: WBGT, PET, OUT-SET.	**4**	**25%**
FIRST INTERNAL TEST			
III	Relationship between nature and built form - Architecture in the tropics: tropical wet climate, tropical dry climate, tropical monsoon climate zones - Climatic characteristics and physiological needs	**5**	**20%**
IV	Examples of climatic design in various tropical countries -Vernacular and Contemporary Architecture in the tropics and Subtropical regions.	**7**	**15%**
SECOND INTERNAL TEST			
V	Warm humid Tropical climate with special reference to Kerala. Climatic conditions and analysis. External and internal spaces. - Design treatment of construction elements.	**5**	**15%**
VI	Study of vernacular influence and local architecture as response to climatic conditions. Field trip and Climate analysis through observation.	**4**	**10%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PE 372	Elective I ERGONOMICS AND PRODUCT DESIGN	2-0-0-0	2	2016

Course Objectives

- To understand the importance of product design in different fields of application.
- To understand importance human ergonomics in design of products
- To understand the principles in good design.

Syllabus

Introducing the students to the field of product design and the process followed in achieving the final product which involves the various steps from iteration to mock ups to model making. The students then will be give an introduction into the various principle of design for achieving the final product in a balanced manner. The students will be given an detailed understanding of ergonomics for the design of products and about the percentiles and designing for the requirements, special emphasis will be given to the design of workstations and workspaces. At last the students will have to apply all these fundamentals and follow the design process to achieve a product at the end of semester.

Expected outcome

- Students will be to explain visual meanings, and understand the relationship of form and function
- Students will be able to understand how the design evolved to satisfy certain needs
- Students will be able to explain
- In the design using mediums and following the design principles.

References Books:

- Brenda Laurel, Methods and Perspectives –
- Dr. DebkumarChakraborty, Indian Anthropometric Dimensions for Ergonomic design Practice - (for Indian body dimensions).
- Donald A. Norman, Emotional Design: Why We Love (or Hate) Everyday Things.
- Koos Eissen and Roselien Steur, Drawing Techniques for Product Designers.
- Richard Morris, Fundamentals of Product Design.
- The Design of Everyday Things by Don Norman

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	Introduction to product design and development, Basic designing processes Visual Perception and gestalt theory	**3**	**20%**
	Graphic Design – Typography, Visual Perception -The principles of visual design including shape, color, visual hierarchy, word/image relationships.	**3**	
II	Product Ergonomics - Introducing Ergonomics. Discipline approach: Ergonomics and Human factors. Human physical dimension concern. Posture and movement. Behaviour and perception Study of Ergonomics and Anthropometrics	**7**	**25%**
FIRST INTERNAL TEST			
III	Occupational safety and stress at workplace in view to reduce the potential fatigue, errors, discomforts and unsafe acts.	**5**	**30%**
	Workstation design. Furniture support. Vertical arm reach and design application possibility. Humanising design: Design and human compatibility, comfort and adaptability aspects	**5**	
SECOND INTERNAL TEST			
IV	Project: Simple Product Design Generation of themes, product brief and presentation. The student has to conceptualize a product and through the various stages of development reach a design for the product. It has to be presented as a working or non- working prototype in a 1:1 scale (exceptions as decided by the faculty).	**7**	**25%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
PE 374	Elective 1 ARCHITECTURAL JOURNALISM	2-0-0-0	2	2016

Course objective

To outline the origin and development of Architectural Journalism in India and demonstrate photo journalism and application in architectural reporting

To identify definition meaning, theory and concept of communication and comprehends forms and barriers to communication.

To reorganizes impact of communication in society and relates ethics with professional practice of architectural reporting

Syllabus

Study origin and development of Architectural Journalism in India:
Development of electronic media in India- Radio & TV Introduction- Scope of journalism in architectural education.
Communication: Definition- meaning and concept- elements and process, functions and scope.
Types and forms of communication -Barriers to communication - 7 C's of communication.
Ethics: Meaning & definition - Ethics of architectural reporting - positive and negative impact on society.

Expected Outcome

1. To make judgments on architectural documentation.
2. To Summarize the concept of photo journalism and its application in architectural reporting

Reference Books

- Agarwal V. B., *Handbook of Journalism.*
- Atoe Wayne, "*Architecture and Critical imagination*", John Wiley & sons, Ltd., 1978.
- Feininger,Andreas, Complete Color Phototgrapher. London: Thamos & Hadso, 1971.
- Freeman,Michael. Introduction to Photography. London: greenwood Press, 1990.
- Harold Evens, Handling News Paper Text.
- Kamath K. V., *Professional Journalism.*
- Kamath K. V., *Journalist hand book.*
- Kerus, Robert L. Photo Journalism. New Jersey: Prentice-Hall, 1980
- Roger Hicks, *Practical Photography,* Cassel. London 1996.
- Sammon,Rick Complete Guide to Digital Photography. New York: W.W.Norton, 2004.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	History of Indian Journalism: development of Indian print media and journalism, origin and development of electronic media in India, Radio & TV Introduction, Scope of journalism in architectural education.	**5**	**15%**
II	Photography - Evolution - Language and meaning- Principles of still camera- Parts of a Still camera- Functions of lenses, shutter, view finder, focusing system etc.	**5**	**20%**
III	Process of Photography - Exposure- factors determining the camera exposure - Basic elements of composition - Perspectives- Focal length- Hyper focal distance - Depth of field - Depth of focus - Types of lenses- normal - wide angle- telephoto - Zoom - Fisheye - filters - types and uses - special effect filters.	**5**	**20%**
FIRST INTERNAL TEST			
IV	Introduction to photo journalism. Application of photo journalism in architectural reporting. Impact of photojournalism as a mass media of communication. Exercise: make a photo story related to architecture / architectural conservation or architectural documentation	**5**	**15%**
V	Ethics: Meaning & definition, Ethics of architectural reporting, its positive and negative impact on society	**5**	**15%**
VI	Communication: Definition, meaning & concept of communication, barriers to communication. 7 C's of communication, Process, functions and scope of architectural communication.	**5**	**15%**
SECOND INTENAL TEST			

SEMESTER VI

Course No.	Course Name	L-T-S-D	Credits	Year of Introduction
ES302	THEORY OF STRUCTURES - VI	2-1-0-0	3	2016

Course Objectives

- To enable the learning and design of masonry retaining walls and footings
- To enable the learning of Earthquake resistant masonry structures
- To enable the learning of Earthquake resistant Reinforced Concrete structures
-

Syllabus

Introduction to brick masonry pillars and walls - Load Carrying capacity of Brick Pillar and Brick wall - Design of brick masonry pillars and walls - Design of masonry retaining walls – lateral earth pressure – stability of retaining walls - Design of masonry foundation – types of foundation – loads acting on the foundation - Elementary Seismology-Causes of earthquakes-Seismic waves. Earthquake hazard map of India - Seismic design philosophy-Earth quake effects on ground - Behaviour of Masonry building during earthquakes. Earth quake resistant provisions - Earthquake resistant Reinforced Concrete Structures - Study of shear walls and diagonal framing - Earthquake resistant Reinforcement detailing - Seismic vulnerability assessment and retrofitting of RC building and masonry buildings - Earthquake effects on non structural elements - Prevention of non structural damages.

Expected Outcome

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

- Analyse and design masonry structures.
- Understand basic details of earthquake resisting structures
-

Text Books:

- Pankaj Agrawal, Manish Shrikhande," Earthquake Resistant Design of Structures, PHI learning Pvt. Ltd
- Shashikant K. Duggal," Earthquake Resistant Design of Structures

References Books:

- IS 4326: 1993
- CVR Murty, "Earthquake Tips", National Information Centre of Earthquake Engineering , www.nicee.org/EQtips.php

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to brick masonry pillars and walls - Load Carrying capacity of Brick Pillar and Brick wall - Design of brick masonry pillars and walls	6	15 %
II	Design of masonry retaining walls – lateral earth pressure – stability of retaining walls Design of masonry foundation – types of foundation – loads acting on the foundation	6	15 %
FIRST INTERNAL EXAM			
III	Elementary Seismology-Causes of earthquakes-Seismic waves-magnitude, intensity. Earthquake hazard map of India. Seismic design philosophy- Stiffness, strength, ductility, damping, center of mass, center of rigidity, torsion. Earth quake effects on ground-liquefaction, land slides.	6	15 %
IV	Behaviour of Masonry building during earthquakes. Earth quake resistant provisions. Best practices-IS4326,IS13828	6	15 %
SECOND INTERNAL EXAM			
V	Earthquake resistant Reinforced Concrete Structures – Elastic structures. Study of shear walls and diagonal framing. Earthquake resistant Reinforcement detailing –beams, columns, beam column joints, openings- IS code explanation-IS 1893,IS 13920.	6	20 %
VI	Vulnerability assessment and retrofitting-Seismic vulnerability assessment of RC building and masonry buildings. Retrofitting of RC and masonry buildings. Earthquake effects on non structural elements-Failure mechanisms-Prevention of non structural damages-Architectural, mechanical, electrical components.	6	20 %
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
ES304	BUILDING SERVICES (HVAC)	2-0-0-0	2	2016

Course Objectives

The course aims at exposing the architecture students to the areas of air conditioning and refrigeration system. To familiarize them with the various air conditioning systems and their applications. To study the design issues for selection of various systems and their installation.

Syllabus

- Introduction, Need and Engineering Fundamentals,
- Components and Equipments in air-conditioning system,
- Various HVAC systems and Application in small and large scale buildings, Cooling load Calculation,
- Duct design, Blower design, Testing and maintenance,
- Relevant case studies and drawings,
- Sustainable design approaches in HVAC.

Expected Outcome

The students will be equipped with the basic technical knowledge regarding the subject, present trends in design and sustainable practices.

References

- Arora S. C. and S. Domkundwar, A Course in Refrigeration & Air conditioning, Dhanpat Rai and Company, 2002.
- Arora C.P, Refrigeration and Air Conditioning, Tata McGraw Hill, 2000
- ASHRAE Handbook 201(Volume 1,2,3)
- Carrer and Pitam, G. Modern Air-conditioning, Healing and Ventilation
- Hanes, Roger W and Myers, Michael E, HVAC System design handbook, McGraw Hill Education, New York
- Lang, V.P., *Principles of Air Conditioning*, Verlag Delmar Publishers, 1961.
- Laub J. P, "Air Conditioning and Heating Practice", Rane Hart Press, New York, 1963.
- Mcquiston Faye C, "Heating, ventilating and air conditioning," Jon Wiley and sons, New York, 2001
- *National Building code of India*, BIS, 2005.
- Ramsey C. G. and H. R. Sleeper, Architectural Graphic Standards (HVAC System), John Wiley & Sons, 2011.
- Servems and fellows, Air-conditioning and ventilation, John Wiley
- William H.Severns and Julian R Fellows, "Air conditioning and Refrigeration", John Wiley and Sons, London, 1988.
- Thomas D.Eastop and William Edward Watson, Mechanical services for buildings, Longman scientific and technical publisher, 1992

Course Plan			
Module	**Contents**	**Hours**	**Sem. Exam Marks**
I	**Introduction** Role and Purpose of HVAC systems in everyday use. Need for architects to study the system. The scope and impact of Mechanical system- Impact of space planning - Impact on Architectural Design - Impact on High rise Buildings - Impact on construction cost – Impact on Global environment.	**2**	**15%**
	Thermal Comfort Standard requirements of ventilation for different conditions of living and works. Conditions for comfort - Control of quality, quantity, temperature and Humidity of air. Indoor Air Quality, Techniques and Adaptations of different climatic conditions. *Exercise: Document any traditional context where passive system for thermal comfort is implemented.*	**2**	
II	**Engineering Fundamentals** Principles of Heat transfer, Thermodynamics, Psychometrics, Psychometric chart & its application. Refrigeration systems, Refrigeration Cycle, Various components of refrigeration systems and cycle: Compressor, Chiller, condensers. Understanding Principles of Air-conditioning.	**6**	**15%**
III	**Components and Equipments in Air conditioning systems** Air Conditioning Equipments - Major equipment used in Air conditioning - their role and Characteristics. Cooling towers, cooling coil, refrigerants, boilers, ducts, electrical systems for HVAC, concepts of zoning, room air distribution-types of outlets. Direct expansion and chilled water systems. Types of compressors air-cooled & water cooled condensers, introduction to cooling tower air handling unit, fan coil unit, pumps, Hot water generator and chilled/ condenser water piping. Space requirements for A/c units, AHU's & a/c plant, ducting, testing and maintenance on ducts and pipes.	**4**	**15%**
FIRST INTERNAL EXAM			

IV	Systems and Applications Various HVAC systems available and their comparison. Small scale: Window AC, Split AC. Large Scale: Centralized systems (parts and cycle), basement ventilation. Ventilation Systems, Basement ventilation, Car park ventilation, Toilet/pantry ventilation, Introduction to air-cooling system. *Exercise: Site visits to study various air conditioning systems.*	**2**	**20%**
	Spatial requirements, Cooling load calculation, Duct design, Blower design, maintenance, Concept of Air exchanges, Ducting. Location with due consideration for reduction of heat gain, economy and energy saving. Layout of supply and return air ducts. General considerations in air duct design layout.	**4**	
SECOND INTERNAL EXAM			
V	**HVAC drawings** Documentation and case studies of small scale and large scale buildings, reading drawings, understanding notations, legends, symbols and sizes. *Exercise: Preparation of schematic air conditioning system layouts for an office building, hotel and auditorium.*	**5**	**20%**
VI	**Sustainable design approaches** Materials and systems for insulation, energy efficient techniques regarding HVAC systems.	**2**	**15%**
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS304	Architectural Design - V	0-0-10-0	10	2016

Course Objectives:

To introduce the students to the rural context to understand the cultural pattern and characteristics. Projects shall have enough emphasis on technology and the application of various building services and circulation systems.
The studio should also introduce students to concepts and techniques and their design application in a given climatic zone..

Learning Outcomes:
Students are expected to demonstrate an understanding and application of theory in architectural design

Reference Books

- Arthur L. Guptill and Susan E. Meyer, 'Rendering in Pen and Ink' , Watson-Guptill, 1997
- Francis D. K. Ching, 'Architectural Graphics', Wiley, 2009.
- Francis D. K. Ching, ‘Architecture: Form, Space and Order’, John Wiley & Sons, 2007.
- Geoffrey Broadbent `Design in Architecture’ John Wiley and Sons, 1973.
- Neuferts' Architect's Data
- Simon Unwin, ‘Analizing Architecture’, Routledge, 2003
- Simon Unwin, ‘An Architecture Notebook Wall’Routledge, 2000
- Simon Unwin, ‘Doorway’, Routledge, 2007

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to minor project- Documentation and preparation of report on housing settlements of a small community, with focus on the integration of socio-economic, cultural patterns and environmental characteristics as generators of an architectural space and form	50	50%
FIRST INTERNAL TEST			
II	Introduction to major project – Projects may be on multi-storeyed commercial, public, semi public etc… Projects shall have enough emphasis on technology and the application of various building services and circulation systems.	50	60%
SECOND INTERNAL TEST			
END SEMESTER EXAM			

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
AS306	WORKING DRAWING	0-0-0-2	1	2016

Course Objectives

To develop an understanding of standards and conventions used for preparation of architectural drawings
To develop the skills of preparing detailed architectural and construction drawings with relation to multi-storeyed or high rise buildings

Syllabus

Introduction to architectural drafting, lettering, dimensioning conventions, title blocks, office standards representation of different materials in plan and section, graphic symbols, conventions of drawing and representation in plan, elevations and sections in working drawings.
Preparation of working drawings of multi-storeyed structures with floor plans, structural plans, sections, elevations, foundation details, joinery details etc

Expected Outcome

- To train the students to prepare proper working drawings in detail for use in construction sites in accordance with the Architecture Design of the project executed.
- The above drawings may be prepared for design projects undertaken in the on going semester or previous semester.

Reference Books

1.

Course Plan

Module	Contents	Hours	Sem Exam Marks
I	Introduction to Architectural Drafting	2	10%
II	Detailed working drawing of Plans, Elevations, and sections.	10	30%
	FIRST INTERNAL EXAM		
III	Service Drawings and structural Drawings	10	30%
IV	Construction Details	8	30%
	SECOND INTERNAL EXAM		
	END SEMESTER EXAM		

SEMESTER VI

Course No.	Course Name	L-T-S-P/D	Credits	Year of Introduction
BC302	BUILDING MATERIALS AND CONSTRUCTION TECHNIQUES - VI	1-0-0-3	3	2016

Course Objectives

- To introduce the study of building materials, their applications and construction methods.
- To familiarize the students with market study of building components and details.
- To understand conventional as well as vernacular and traditional building materials and practices.
- To understand prevailing BIS specifications.

Syllabus

- Study of advanced concrete :types, manufacturing process, properties, uses – Admixture – types, components, properties, uses
- Advanced Structural Concepts in Architecture: Pre stressed structures, tensile structures membrane structures, plate structures, special (pneumatic, kinetic and mobile) structures – Concept, Classification and application in architecture
- Pre-fabrication & Modular Co-ordination: Concept, Definition, advantages and disadvantages
- Applied finishes - Floor finishes: Types of flooring, methods of laying, furnishing, Selection criteria

Expected Outcome

- Comprehend the advanced Structural Concepts in Architecture
- Identify different floor finishes appropriate for different architectural projects

Reference Books

- Arthur Lyons, 'Materials for Architects and Builders', Elsevier Butterworth-Heinemann, 2004.
- Francis DK Ching, 'Building Construction Illustrated' (4th edition), Wiley- India, New Delhi, 2012.
- 'Harry Parker, 'Materials and Methods of Architectural Construction', John Wiley & Sons Canada, 1958.
- H Leslie Simmons, 'Construction – Principles, Material & Methods', 7th edition, John Wiley & Sons Inc., New York, 2001.
- P C Varghese, 'Building Materials', Prentice Hall of India Pvt. Ltd, New Delhi, 2010.
- R Barry, 'The Construction of Buildings (Vol. I-II)', 6th edition, Affiliated East-West Press Pvt. Ltd., New Delhi, 1996.
- Relevant BIS codes.
- Rosen Harold J, Construction Materials for Architecture, Krieger Pub Co, 1992.
- RC Smith & TL Honkala, 'Principles and Practices of Light Construction', Prentice Hall, Englewood Cliff, NJ 07632, 1986.
- W B McKay, 'Building Construction', Orient Longman 21, London, 1938-44.

Course Plan			
Module	**Contents**	**Hours**	**Sem Exam Marks**
I	**Study of advanced concrete** Lightweight, high density, fiber reinforced, polymer concrete, outline of manufacture, properties and uses of the above. Admixtures - Water repellent, waterproofing compounds accelerators, air entraining agents, hardeners, plasticizer Their properties and uses. *Exercise: Market survey of concrete admixtures.*	**10**	**20%**
II	**Advanced Structural Concepts in Architecture.** **Pre stressed concrete structures**: Precast pre stressed construction. Use and examples of various pre stressed structures. Two-way waffle slab, Two-way flat plate, Two-way flat slab, Pre tensioning, Post tensioning, Hollow core slabs, T beam and slab. **Tensile structures**: Concept of tensile structures, formation, classification, use and examples of various cable structures. Application of cable structures in architecture. Materials and construction methods of membrane structures. **Plate structures**: Definition, classification and application, concept and application of folded plates, flat slab and coffered slab. **Special Structures**: Concept, Classification and Application of Pneumatic Structures, Kinetic Structures and Mobile Structures, Portal frames: Definition, and Application. *Discussion: Role of structural grids in planning.* *Exercise: Case studies of tensile structures, folded plates and coffered slab.* *Drawings: Tensile structures, folded plates and coffered sla, Portal frames*	**20**	**30%**
FIRST INTERNAL TEST			
III	**Pre-fabrication & Modular Co-ordination** Introduction to the concepts of standardization – need and importance. Introduction to concepts of Modular Coordination Objectives of Modular coordination & definition of Basic Module. Modular controlling dimensions, Planning Modules and preferred Multi-modules. Introduction to concepts of prefabrication. Advantages & disadvantages of onsite & off-site prefabrication. Methods of prefabrication & Examples of prefabricated components. Process of prefabrication. Various issues related to prefabrication industry & Examples of prefabrication concepts. *Discussion: Future architecture and pre fabrication*	**20**	**30%**

	Exercise: Documentation of pre fabricated components. *Drawings: Design and draw prefabricated structural solution for buildings like public toilet facility, bus waiting shelter, kiosk etc.*		
IV	**Applied finishes - Floor finishes.** Types of flooring, methods of laying, furnishing of floors with different floor finishes like cement, colored cement, mosaic, terrazzo, tiles, wood, parquet flooring, stone, etc. Classification & properties of tiles used in flooring. Selection criteria & Methods of fixing various types of tiles. Different type of resilient and vibration resistive floor like rubber, Linoleum and PVC flooring. General character and construction process of traditional flooring. *Discussion: Selection of appropriate floor finish based on Cost, cleanliness & Hygiene.* *Exercise: Case study of floor finishing techniques.*	**10**	**20%**
SECOND INTENAL TEST			
END SEMESTER EXAM			