

36. THIRD SEMESTER SYLLABUS

Sem	Subject Group	Course Code	Subject	Hours/week			Credits	Marks			
				T	S	W/L		CA	University Exam		Total
									Jury	Written	
III	I (a)	19AR03001	Architectural Design 3		10		10	250	250		500

Course Overview:

Familiarizing the process of design, Space articulation and Development of form

- To equip students to conceptualize form and space emphasizing the importance of the process of design
- To enable students to conduct Data collection, Case study and Analysis and to formulate their concepts and program
- To familiarize students with Development of Project Brief, Process of site analysis, Development of circulation diagram, form, function and their correlations
- To introduce students to basic structural systems and their applications
- To enhance the student's representation skills through 2D techniques and 3D modeling

Sustainable design objectives: Climatological influence on the design approach, natural materials, natural lighting and ventilation and passive technology.

Course Outcomes:

Upon completion of the course, the student should have:

- An exposure to architectural experience through the understanding of Elementary principles of Architectural Design on the basis of structure, function, context and aesthetics.
- An understanding of multi-space architectural unit and its expansion
- An understanding of the process and methodology of design
- An understanding of materials, its properties and design application

Major Project

Conceptualization of space and form through process of design development and space planning, responsive to the given context. Suggested projects may be design of architectural spaces (Not exceeding 200 SQM) such as residence, weekend cottage, coffee shop etc.

Critical analysis of a suggested space for functionality, structural stability, aesthetics, contextual relationship etc.

Emphasis may be given on:

- Space perception and the underlying concept
- Functional aspect of the space, user needs, circulation, efficient programming
- Architectural Composition and built form, massing and volume of space
- Application of building materials – color, texture and composition
- Climate responsive design, Passive Architectural techniques
- Space Planning and layout of Interior spaces

Minor Project

Documentation (Maximum of 3 days duration) of traditional Buildings and Portfolio preparation. This project may be carried out in association with settlement study of 19AR05001.

Time Bound Project

Short duration of (one day or less) Projects emphasizing on functionality of space to enhance student's imagination/innovation and decision-making skills.

Reference:

- Anderson, J. (2011). *Architectural design*. Lausanne: AVAAcademia.
- Arvind, K., Nick, B. and Steve, S. (2001). *Climate responsive architecture*. New Delhi: Tata McGraw-Hill Pub.Co.
- Bakshi, S. (2008). *Architecture in Indian sub-continent*. Delhi: Vista InternationalPublishing.
- Bawa, G. and Robson, D. (2002). *The complete works*. London: Thames &Hudson.
- Campos, C. (2008). *Living in small spaces*. Barcelona: LOFTPublications.
- De Chiara, J. and Crosbie, M. (2001). *Time-saver standards for building types*. New York:McGraw-Hill.
- De Chiara, J., Panero, J., Zelnik, M. and Michael, J. (2001). *Time-saver standards for interior design and space planning*. New York:McGraw-Hill.
- Panero, J. and Zelnik, M. (n.d.). *Human dimension & interiorspace*.
- Powell, R. (2001). *The tropical Asian house*. Singapore:Select.
- Ramsey, E. (2007). *Architectural graphic standards*. Hoboken, N.J.: John Wiley &Sons.
- Rapoport, A. (1969). *House form and culture*. Englewood Cliffs (N.J.):Prentice-Hall.
- Yatin, P. (n.d.). *Elements of SpaceMaking*.

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III	I (b)	19AR03002	Building Materials and Technology 3	1	3		4	100	100	200	

Course Overview:

- Understanding of building materials like Steel &Aluminum products andpaints.
- Understanding different type of doors andwindows.
- Understanding about the modern construction materials like glass and glass products, plastics, products and its application in constructionindustry
- The student should develop the skill to represent various construction techniques as well as materials through drawings supporting their buildingdesign.

Course Outcomes:

Upon completion of the course, the student should:

- Develop necessary decision-making skills in using appropriate construction technologies and materials while designing buildings, based on understanding of their potentials and properties.

Module 1: Steel, Doors, Windows

Learning Strategies:

- Lecture on steel, types of door and window fittings and surface finishes.
- Market study on types of fittings used for different purposes

Module Contents:

- Types-pig iron, cast iron, wrought iron
- Steel –mild steel, medium carbon steel, high carbon steel, manufacturing, composition, properties
- Anti-corrosive measures, Market forms of steel with particular emphasis on angles, sections and channels.
- Aluminum and its properties, UPVC
- Doors –Functional requirements, Types of doors – based on movement, materials and function
- Doors and design considerations: effective clear width of door openings, minimum width of passage way for certain door sizes etc.
- Windows –functional requirements, Types of windows- fixed light and opening light
- Air changes, Quality of daylight
- Strength stability and air tightness, Resistance to passage of heat, Window U values

Market survey and presentation for Jury

- Door and window hinges like butt hinges, pin hinges, parliament hinges, garnet hinges, counter flap hinges, strap hinges, piano hinges, auto-closing hinges - Door and window bolts like sliding door bolt, tower bolt, flush bolt – door handles – door locks – other fastenings to door and windows like hook and eyes, window stays, door stoppers, door closers, caster wheels, floor springs, pivots, magnetic catchers for wooden cupboard.

Module 2: Plastics**Learning Strategies:**

- Lecture on plastics, type of glasses & finishes
- Market survey for understanding about the topic.

Module Contents:

- Thermoplastics and thermosets: Thermosetting and thermoplastics, resins, fabrication of plastics, polymerization and condensation - Application of plastic in building construction.
- Properties and architectural uses of plastics: structural plastics – reinforced plastics and decorative laminates - plastic coatings, fabrications of plastics – FRP, plumbing applications – PVC, PPR, CPVC etc.
- Composition, types of glass: wired glass, laminated glass, double glazing, glass building blocks, their properties (including thermal and acoustics) and uses in buildings –
- Application of glass in construction – Structural glazing, curtain wall glazing – toughening, Insulation, applications in the building industry with emphasis on energy efficiency. Natural

and manufactured flooring materials, properties, uses. Applications

Module 3: Surface Finishes

Learning Strategies:

- Lecture on architectural finishes & their selection criteria
- Market study on different types of practices
- Site visits of various finishes at different stages till the final finishes.

Module Contents:

- Construction of ground floor and upper floor flooring
- Criteria for selection of flooring materials: -Appearance, resistance to abrasion & slipness, smoothness, durability, damp resistance, thermal insulation, fire resistance etc.
- Different types of floor finishes – natural & artificial - Natural stone, wood, ceramic, vitrified, oxides, vinyl, epoxy, terracotta etc.
- Inherent finish and applied finish
- Paints, distempers & varnishes – types – composition – properties – environmental, climatological and durability aspects - application – Uses – BIS specifications - Covering capacity, method of distemping wall surfaces, and painting of timber and iron. External finishes, Different types of finishes.
- Pre cast concrete cladding panels, GRC cladding panel, Sheet metal cladding
- Rain screens, Suspended glazing system etc.

List of drawings for Jury (Minimum 7 sheets)

- Types of windows
- wooden windows-
- Steel windows
- Aluminum windows
- Types of doors: hinged, sliding, sliding and folding doors
- Timber doors
- UPVC doors & windows
- Structural glazing

Materials collected from the market survey shall be presented for the jury

Reference:

- Don, W. (1972). *Construction Materials and Process*. McGraw Hill Co.
- Emmitt, S., Gorse, C. and Meaden, A. (n.d.). *Barry's introduction to construction of buildings*.
- Jack, L. (1986). *Construction Materials and Methods*. Careers, South Holland, Illinois: Wilcox Co.Ltd.
- Rangwala S. C. (1997). *Engineering materials*. Charotar Publishing House, India.
- Shetty, M. (2007). *Concrete technology*. Ram Nagar, New Delhi: S.Chand.
- Varghese, P. (2005). *Building materials*. Prentice-Hall of India.

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III	I (c)	19AR13003	Professional Skill Enhancement 3			4	2	50	50		100

Course Overview:

This course intends to provide/ enhance the soft skills in order that students perform well in their academics and beyond. These skills are intended to support the student to perform better in her/his core subjects and also build up robust performance through hands-on workshops and laboratory training. This course is subdivided into two categories – Mandatory and Optional. Mandatory courses help in preparations for respective semester subjects. The optional category helps students to take personal initiatives to develop in specific areas that can widen their horizon of their understanding of architecture and also initiate action at the society level. There are also options to work on competitive exercises alongside other similar institutions.

Course Outcomes:

Upon completion of the course, the student should:

- be given an exposure of varied skills that can bring in confidence in handling their core subjects such as workshops, communication skills, computer applications etc.
- be able to develop team spirit and interpersonal skills to manage complex situations.
- be able to cope with stress and develop multi-tasking capabilities.

Module 1: Communication Skills 2

Learning Strategies:

- Language lab
- Group discussions and Interactive sessions

Module Contents:

- Training in oral and written communication skills to effectively communicate ideas.
- Interpersonal Communication.
- Verbal & Non-verbal communication, Body language, Persuasion.
- Individual Presentations (Audience Awareness, Delivery and Content of Presentation)
 - Writing Skills: Sentence formation; Use of appropriate diction; Paragraph and Essay Writing; Coherence and Cohesion.
 - Letter Writing: Formal, informal and demi-official letters; business letters.
 - Technical Writing: Differences between technical and literary style, Elements of style; Common Errors.
 - Report Writing: Basics of Report Writing; Structure of a report; Types of reports.
 - Presentation Skills: Oral presentation and public speaking skills; business presentations.
 - Group Discussion: Differences between group discussion and debate; Ensuring success in group discussions.
 - Non-verbal Communication and Body Language: Forms of non-verbal communication; Interpreting body language cues; Kinesics; Proxemics; Chronemics; Effective use of body language.
- Technology-based Communication: Netiquettes: effective e-mail messages; power-point presentation; enhancing editing skills using computer software.

Module 2: Computer Application 1

Learning Strategies:

- Computer lab sessions guided by experts
- Group discussions and Interactive sessions
- Develop theoretical understanding of AutoCAD and its relevance in Architecture. Students would develop skills of 2D drafting using various tools and techniques.

Module Contents:

- Introduction to computer aided drafting
- To develop and understand tools and basic set up for computer aided drafting
- Theoretical understanding of CAD
- Develops and draws various architectural plans, elevations and sections through 2D CAD
- Manipulate and alter through various tools and techniques existing architectural drawings in 2D CAD

Module 3: Theatre/Music/any other co-curricular activities**Learning Strategies:**

- Technical and hands on workshops
- Group discussions and Interactive sessions
- Self-initiatives

Module Contents:

- Optional content to be developed by each institution in order to help students to take part in activities that involve larger groups and facilitate peer learning.
- The activities could be skill oriented like Theatre/ Music training or student initiated societal activities or participation in NASA or similar student led group initiatives which has an academic content as well.

Reference:

- Cadfolks (2018). *AutoCAD 2019 for Beginners*. 1st ed. Kishore.
- Omura, G. and Benton, B. (2018). *Mastering AutoCAD 2019 and AutoCAD LT 2019*. 1st ed. Sybex.

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III	II	19AR03004	History of Architecture 3	2			2	50		100	150

Course Overview:

The subject aims at imparting knowledge about the development of architecture during medieval era in Europe, India and Kerala as a response to socio-cultural, geographical and political changes as well as technological advancements. The course also intends to expose the students to detailed studies on national as well as regional architectural history to prepare them well for contextual design applications.

Course Outcomes:

Upon completion of the course, the student should:

- Be able to relate and identify built forms through socio cultural, climatic, political, economic influences on them in respective geography and timeline
- Be able to identify and compare elements of architecture, styles and intricate details across different regions
- Be able to use a theoretical base developed from architectural history in their design process

Module 1: European Architecture in medieval times

Learning Strategies:

- Unit wise lectures on how the built form in the region is a manifestation of its socio, cultural, climatic, political, economic context
- Drawing exercises on various significant architectural works in various eras/geographies
- Lectures/ assignments on construction techniques
- Lecture/ discussion on observation of periodical changes and cross influences between various geographies
- Each lecture will have Pre- requisite readings and each module will have to specify self-learning component in the lecture plans

Module Contents:

- **Early Christian and Byzantine Empire 1:** Emergence and spread of Christianity | Old St. Peter's, Rome the evolution of early Christian Church form from the Roman basilica- St. Clemente
- **Byzantine Empire 2:** Centralized plan concept- St. San Vitale, Ravenna (brief) | The creation of eastern and western roman empire | Byzantine architectural character with study of Hagia Sophia (detail)
- **Romanesque Architecture:** Romanesque period: Monastic orders & development of Craft and merchant guilds, Influences & architectural character of Romanesque churches in Italy (Pisa complex), France (Abbey Aux Hommes) and England (Tower of London)
- **Gothic Architecture in France:** Development of Gothic architecture in France (Religious and social influences) - Evolution of vaulting and development of structural systems - Outline of Architectural characters - Examples: Notre Dame at Paris.
- **Gothic Architecture in Italy & England:** Development of English gothic vaulting - Outline of

Architectural character in England -Examples: Westminster Abbey and Hampton Court Palace at London | Development of gothic architecture in Italy - Outline of Architectural characters - Examples: Doges Palace at Venice, Milan Cathedral

- **Renaissance Architecture in Europe 1:** Italian Renaissance - The idea of rebirth and reJuryl of art – Factors influencing renaissance architecture -Outline of Architectural character during the early Renaissance, High Renaissance and Baroque Periods (brief) -Features of a typical Renaissance palace - Examples. Palazzo Ricardi. | Study of the contributions of the following architects: Brunelleschi, Michelangelo and Andrea Palladio - Examples - St. Peters basilica at Rome, Villa Capra inVicenza
- **Renaissance Architecture in Europe 2:** Factors influencing French renaissance - Architectural character during the classical & Rococo periods (brief) - Examples - Chateau de Chambord and the Louvre at Paris. | Factors influencing English renaissance – Introduction to domestic architecture in Britain during the Elizabethan, Jacobean, Baroque and Georgian periods (brief) - Study of the works Sir Christopher Wren & Inigo Jones, Examples - St. Paul's Cathedral at London and Banqueting House at Whitehall.

Module 2: Indian Architecture in medieval times - Hindu Temple

Learning Strategies:

- Unit wise lectures on how the built form in the region is a manifestation of its socio cultural, climatic, political, economic context
- Drawing exercises on various significant architectural works in various eras/geographies
- Lectures/ assignments on construction techniques
- Lecture/ discussion on observation of periodical changes and cross influences between various geographies
- Each lecture will have Pre- requisite readings and each module will have to specify self-learning component in the lecture plans

Module Contents:

- **Evolution of Hindu Temple:** Early shrines of the Gupta and Chalukyan periods - Tigawa temple and Ladh Khan temple | Introduction to the development of the Indo-Aryan & Dravidian style - Examples - Papanatha and Virupaksha temple at Pattadakal
- **Dravidian Style Temples 1:** Dravidian style – Definition / explanation of Mandapas & Rathas. Masonry temples & Rock cut architecture of Pallavas - Shore temple and five rathas at Mahabalipuram Dravidian Orders – Evolution of Dravidian orders under pallavas, Chola's and Pandya's. (brief)
- **Dravidian Style Temples 2:** Example of Chola style - Brihadeeswara temple at Tanjore. | Evolution of Gopuram & temple complexes – Example of Pandyan style - Meenakshiamman temple, Madurai
- **Indo-Aryan Style of Temples:** Classification of Indo-aryan temples Salient features of an Indo Aryan Temple - Examples at Orissa - Lingaraja temple at Bhuvaneshwar & Sun temple at Konarak - Example in central India - Khandarya Mahadev temple at Khajuraho - Example in

Gujarat - Surya Temple at Modhera

Module 3: Indian Architecture in medieval times - Islamic Architecture

Learning Strategies:

- Unit wise lectures on how the built form in the region is a manifestation of its socio cultural, climatic, political, economic context
- Drawing exercises on various significant architectural works in various eras/geographies
- Lectures/ assignments on construction techniques
- Lecture/ discussion on observation of periodical changes and cross influences between various geographies
- Each lecture will have Pre- requisite readings and each module will have to specify self-learning component in the lecture plans

Module Contents:

- **Islamic Architecture - Imperial style 1:** Classification of Islamic architecture in Indian, religious and secular typologies of Islamic architecture | Examples under imperial style; slave dynasty - Qutb Complex, Quwwat-ul-Islam mosque, Qutb Minar. | Khalji dynasty - Alai Darwaza at Delhi (concept of squinch arches)
- **Islamic Architecture - Imperial style 2:** Tughlaq dynasty - Tomb of Ghiyasuddin Tughlaq, Khirki Masjid | Sayyid dynasty - Tomb of Mubarak Sayyid | Lodi dynasty - Tomb of Sikander Lodi | Suri dynasty - Tomb of Sher Shah Suri, Bihar)
- **Islamic Architecture - Provincial style 1:** Characteristics of the provincial styles in different regions through examples (brief) - Punjab style - Tomb of Shah Rukni Alam - Bengal style - Chotasona Masjid at Gaur-
- **Islamic Architecture - Provincial style 2:** Gujarat style - Jami Masjid at Ahmadabad - Deccan style - Golgumbaz at Bijapur and Charminar at Hyderabad
- **Islamic Architecture - Mughal Style 1:** Characteristics of Mughal architecture, planning, materials and architectural elements. Development of the Mughal style under different rulers - Humayun - Humayun's Tomb at Delhi
- **Islamic Architecture - Mughal Style 2:** Akbar- examples - Fatehpur Sikhari (planning, Buland Darwaza, Diwan-i-Khas, Tomb of Salim Chisti) and Akbar's Tomb at Sikandara. Shahjahan - examples - The Taj Mahal, at Agra - Red Fort at Delhi (Diwan-i-Aam, Diwan-i-Khas, Mumtaz Mahal and Rang Mahal)

Reference:

- An Architectural survey of Temples of Kerala. (1978). Published by ASI.
- Brown, P. (1983). *Indian architecture (Islamic Period)*. Bombay: Taraporevala and Sons.
- Ching, F., Jarzombek, M. and Prakash, V. (2010). *A global history of architecture*. Hoboken, NJ: Wiley.
- Fletcher, B. (1999). *A history of architecture*. CBS Publication (Indian Edition).
- Grover, S. (1991). *The architecture of India (Islamic Period)*. New Delhi: Vikas Pub. House.
- Guruswamy, V. (2003). *Gateway to Indian Architecture*. Edifice Publication.
- Hillenbrand, R. (1994). *Islamic architecture Form, Function and Meaning*. Edinburgh University.
- Lloyd, S., Martin, R. and Müller, H. (1986). *History of World Architecture – Series*. London: Faber and Faber Ltd.
- Michell, G. (2009). *Architecture of the Islamic world*. Farnborough: Thames and Hudson.
- Michell, G. and Davies, P. (1990). *Monuments of India, Vol I, Buddhist, Jain*. London, England: Viking.
- Nuttgens, P. (1983). *The story of architecture from antiquity to the present*. H F Ullmann Publishers.
- Pier Luigi, N. (1972). *General Editor – History of World Architecture – Series*. New York: Harry N. Abrams, Inc. Pub.
- Tadgell, C. (1990). *The history of architecture in India*. London: Phaidon.
- Volwahren, A. (1969). *Living Architecture – India (Buddhist and Hindu)*. London: Oxford and IBM.
- Webb, C., Schaeffer, P. and Palm, F. (1962). *Western civilization Volume 1*. New York: Van Nostrand.

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				T	S	W/L		CA	University Exam		Total
									Jury	Written	
III	II	19AR03005	Theory of Structures 3	2			2	50		100	150

Course Overview:

The course primarily aims at providing the concepts of strength of materials and its importance in structural design. It focuses on the conceptual study of behavior and deformation of structural members upon flexure, compression and torsion.

Course Outcomes:

Upon completion of the course, the student should:

- be able to figure out the importance of engineering properties in selection of material.
- be able to develop basic skill to choose appropriate material for their project based on structural capability along with other criteria.
- be able to visualize the behaviour of flexure, compression and torsion in structural members to develop their design for a stable and practical structure.

Module 1: Strength of materials, Stress, Strain and Elastic constants.

Learning Strategies:

- Lectures on the below contents by presentation and discussion with relatively accessible mathematical equations and calculations.
- Lectures by using analogies and examples to explain structural concepts.

Module Contents:

- Introduction to strength of materials- Relevance of material strength in structural design.
- Stresses, Strains and Deformation – Concept, Normal stress (Compressive and tensile stress), shear stress, bending stress, Bearing stress and Torsional stress.
- Elasticity, strength and deformation – Relationship between stress and strain, Stress strain curve of mild steel and salient points. Ductile and brittle material. Elastic and plastic deformation.
- Elastic Constants – Significance of elastic constants, Modulus of elasticity, Modulus of Rigidity, Poisson's Ratio, Bulk Modulus. Comparative study of different structural materials based on elastic constants.
- Concept of Axial stresses - Bars of varying cross section, Deformation due to self-weight, Stress in composite bar.
- Temperature stresses – Concept, Temperature stress in composite bar.
- Principle of superposition and concept of strain energy.

Module 2: Behaviour of beams, Shear and Bending stress, Indeterminate structures**Learning Strategies:**

- Lectures on the below contents by presentation and discussion with relatively accessible mathematical equations and calculations.
- Lectures by using analogies and examples to explain structural concepts.

Module Contents:

- Beams: Classification beams- simply supported Cantilever, Fixed, and overhang. Type of loads – Point load, uniformly distributed load, uniformly varying load, Concentrated Moment. Types of supports- Fixed, Hinged, Roller.
- Shear and bending moment – Analysis of simply supported, cantilever, overhanging beams Shear force and bending moment diagrams – only analytical method
- Bending (Flexural) stresses in beams- Theory of simple bending, Assumptions and derivation of bending equation. Bending rigidity/stiffness. Bending stress in symmetrical beams, Section modulus, Moment carrying capacity.
- Shear stresses in beams – Concepts, distribution of shear stresses in simple sections
- Indeterminate structures- static and kinematic indeterminacy. Determination of degree of static indeterminacy for beams and frames – (No Problems)

Module 3: Behaviour of Columns, Deflection of Beams, Concept of Torsion**Learning Strategies:**

- Lectures on the below contents by presentation and discussion with relatively accessible mathematical equations and calculations.
- Lectures by using analogies and examples to explain structural concepts.

III	II	19AR03006	Climatology	2			2	50		100	150
Course Overview:											
<p>The subject primarily aims to provide a holistic understanding of climate in global, national and local contexts including a study of basic terminology used and various methods of classification and measurement of climatic data. The course also introduces the concept of human comfort and its relationship with climate and the built environment. Further, design strategies for built in the tropical region are stressed upon and concepts of lighting, ventilation and shading devices introduced.</p> <p>Each concept shall be taught through an active use of the Climatological laboratory and using relevant traditional and contemporary buildings as case studies in both the International and Indian scenarios. In order to expose the students to the various design strategies for buildings in the tropical region, climate responsive strategies in shading, lighting and ventilation shall also be worked out in the architectural designstudio.</p>											
Course Outcomes:											
<p>Upon completion of the course, the student should:</p> <ul style="list-style-type: none"> • learn how to analyze climatic factors in relation to the humancomfort • learn how to implement climatic factors in architecturaldesign 											
Module 1: Introduction to Climate											
Learning Strategies:											
<ul style="list-style-type: none"> • Lecturenotes • Climatologylab • Groupdiscussion • Debates • Case studies • Analysis • E-resource 											
Module Contents:											
<ul style="list-style-type: none"> • Climate & weather - Components and elements of climate, measurements and representations of climatic data. • Climatic factors -Solar geometry the coordinates, earth's rotation, seasonalvariations azimuth angles & altitude. • Sun path diagram & solar envelope, earth's thermal balance, globalwinds. • Climate classification -Global climate classifications (Koppen). • Tropical climate, Indian climate classification (SP 41), characteristics, Design strategies for various climatic zones in India, Vernacular examples of architecture evolved from climate, Climate of Kerala. Analysis of a traditional building in Keralacontext. • Scales of climate - Macro, Meso& Microclimate, Urban and rural climate, Siteclimate. • Factors affecting site Climate-Effect of landscape elements on site/micro climate, Siteanalysis concepts. 											
Module 2: Climate and Human Comfort											

Learning Strategies:

- Lecture notes
- Climatology lab
- Hands-on Workshop
- Analyzing examples from books and journals
- E-resource

Module Contents:

- Thermal comfort factors - Physiological aspects, Body heat balance.
- Thermal Comfort indices, Thermal comfort chart - psychometric chart, Bioclimatic chart, ET chart, CET chart.
- Principles of heat transfer- transfer of heat through building envelope.
- Terminology - conduction, convection, radiation, Resistivity, Specific heat, and Thermal capacity. Performance of different materials with respect to its thermal gradient and periodic heat flow.
- Application of heat exchange in building- Passive design techniques in built fabric and un-built environment.
- Building orientation and design of openings to regulate heat gain by using solar chart in climatic design.
- Design of solar shading devices- movement of sun, locating position of sun, overheated period, shading devices, solar shading & shadow angles and their performance evaluation.

Module 3: Daylighting and Natural Ventilation**Learning Strategies:**

- Lecture notes
- Climatology lab
- Hands-on Workshop
- Analyzing examples from books and journals
- E-resource

Module Contents:

- Day lighting: Climate & natural lighting, its transmission, reflection, diffusion and glare, Daylight parameters, Daylight factor, Advantages and limitations in different climatic zones, Daylight systems, strategies & devices. Daylight design for various occupancies using tables and graphs as given in SP41.
- Natural ventilation: Functions of natural ventilation, Thermally induced air current - Stack effect & Venturi effect, Passive ventilation techniques, ventilation ducts.
- Air movements around and through the buildings- Air flow around the building, Wind shadows.
- Air flow through the building, Design considerations

Reference:

- Arvind, K., Baker and Szokolay (2002). *Climate responsive architecture*. New Delhi: Tata McGraw-Hill Pub.Co.
- DeKay, M., Bennett, S. and Brown, G. (1985). *Sun, wind & light*. John Wiley andSons.
- Evans, M. (1980). *Housing, climate, and comfort*. London: ArchitecturalPress.
- Givoni, B. (1982). *Man, climate and architecture*. London: Applied SciencePublishers.
- Joseph, B. (2006). *Environmental science and engineering*. New Delhi: TataMcGraw-Hill.
- Koenigsberger, O. (1996). *Manual of tropical housing and building*. Bombay: OrientLongman.
- Konya, A. (1984). *Design Primer for Hot Climates*. London: The ArchitecturalPress.
- Masters, G. (2004). *Introduction to environmental science and technology*. 2nd ed. PierceEducation.
- SP 41: Handbook on Functional Requirements of Buildings. (1987). Bureau of IndianStandards.

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III	II	19AR03007	Humanities	2			2	50		100	150

Course Overview:

Architecture serves as an ultimate embodiment of the human condition; it is shaped by the cultural, religious, socio-economic, and environmental forces of a people – among many other considerations that extend beyond simply aesthetics. How civilization shapes its space, and determines the shape of the built environment in relation to the natural world can speak volumes about what its core essence is, particularly as it transforms over time. Studying the philosophical meaning of shaping and reshaping the world throughout time offers the student a gestalt understanding of a physical and spatial exploration of the human condition and how they themselves fit within.

Students will be exposed to and asked to form an opinion about the myriad forces that shape the built environment and how it (architecture and urban form) contributes to the cultural identity of people, period, and place. At the beginning, through the semester, and at the conclusion students will reflect upon their personal definitions of architecture + humanity, and the inclusion of key concepts and considerations of the course will be assessed.

Course Outcomes:

Upon completion of the course, the student should:

- Comprehend what have been the major issues in the development of architectural design in socio- cultural context
- Illustrate the place specific nature of architectural design
- Appraise about architecture and its relationship to its historical, political, social, economic, technological contexts
- Develop an appreciation for space, and be able to discuss the role of design in enhancing life in the 21st century and before

Module 1: Sociology and Its Relation to Architecture

Learning Strategies:

- Lectures and written assignments

Module Contents:

- Definition of Sociology; nature, scope and utility of Sociology; branches of sociology
- Different social processes - cooperation, conflict, competition, accommodation, assimilation, progress and evolution
- Forms of social organization: society, community, family, culture
- Different family structures and architectural responses to different family types and housing typologies (traditional and contemporary)
- Relationship of social, economic and political systems to the built environment, relevance in Architecture.

Module 2: Man, Environment and Society**Learning Strategies:**

- Lectures and written assignments

Module Contents:

- Journey of man from ancient through medieval to contemporary; formation of group living, settlements and beginning of community living as rural & urban
- Concepts of society, culture, traditions & civilization and their progressive development through different ages from Paleolithic to contemporary
- Culture and society, cultural lag, Deviant subculture, Culture and civilization.
- Different theories about culture and social identity with reference to architecture, social construction of space.
- Relation between culture and built form (exploration of architectural examples) based on design practices followed across India and the world
- Social development for Sustainable development, Sustainable Indigenous communities with case examples.

Module 3: Indigenization and Cultural Change**Learning Strategies:**

- Lectures and written assignments

Module Contents:

- Society and environment, Social change, Factors of social change, Social stratification, Rural & Urban, class & caste
- Social and cultural aspects of building practices; Architecture as an identity; Loss of architectural identity and role of culture.
- Social changes in Kerala (structural, occupational, rural, religious and housing) including renaissance and social reform movement.
- Kerala Model Social development - characteristics, advantages and disadvantages.
- Urban Sociology focusing on study of life and interaction in cities and metropolitan areas, the economic, cultural and social changes of urbanisation leading to production or disintegration of identities.
- Study of demography, migration Social aspects of migration, gentrification, ghettoization, housing & slums and its effect on urbanisation and architecture.

Reference:

- An Introduction to Sociology. (n.d.).VidyaBhushan.
- Bart, P. and Frankel, L. (n.d.). *The student's sociological handbook*.
- Brinkerhoff, D. and White, L. (1998). *Sociology*. St. Paul, MN [etc.]: WestPubl.
- Chitambar, J. (n.d.). *Introductory ruralsociology*.
- Dr. Kumar, K. (n.d.). *RuralSociology*.
- Dr. Valsyayan (n.d.). *UrbanSociology*.
- McCurdy, D., Shandy, D. and Spradley, J. (n.d.). *Conformity and conflict: Readings in Cultural Anthropology*.
- Philipchalk, R. and McConnell, J. (1994). *Understanding human behavior*. Fort Worth: Harcourt Brace Jovanovich CollegePublishers.
- Rapoport, A. (1969). *House form and culture*. Englewood Cliffs (N.J.):Prentice-Hall.
- Saile, D. (1986). *Architecture in cultural change: Essays in Built Form and Culture Research*. [Lawrence, KS]: School of Architecture and Urban Design, University of Kansas.
- Singh, K. (1973). *Principles of sociology*. Aminabad: PrakashanKendra.

Sem	Subject Group	Course Code	Subject	Hours/week			Credits	Marks			
				T	S	W/L		CA	University Exam		Total
									Jury	Written	
III	I (c)	19AR03008(A)	Elective Workshop I: Architectural Photography	1		2	2	50	50		100

Course Overview:

This course aims at equipping students with the creation of successful images of exterior and interior architecture, as well as architectural models. The course discusses equipment, processes, and procedures necessary for the photography of built and unbuilt spaces, dusk/night architectural landscapes, and construction progress. Students will learn to use Digital SLR camera, lighting techniques, software and to create output. Students will be able to use High Dynamic Range (HDR): multiple exposures to create dramatic architecture/interior images without additional professional lighting.

Course Outcomes:

Upon completion of the course, the student will:

- impart the skills of capturing aesthetically appealing and creative architectural photographs through the use of appropriate cameras/ lenses and lighting conditions.

Module 1: Introduction to Photography

Learning Strategies:

- Lectures on relevant topics.
- Appraisal of famous photographs on the basis of principles and elements of photography.
- **Suggestive Exercises:** Task that would enable students to understand and explain the basic concepts of photograph.

Module Contents:

- General introduction to the art of photography; Origin and development of photography, Principles of design and its application in photography,
- Types of camera: DSLR, Mirrorless, Point and Shoot etc., Parts of camera, Basic Modes, Types of lenses and Application, Filters, Camera Accessories
- Basic Concepts: Exposure- Shutter speed, Aperture, ISO, Metering, Pixels, Resolution, Sensor size
- Lighting- Direction of lighting - front, side, back; shadows, texture, and effects of clouds; Types of artificial lighting, combined daylight and flash, Low light photography
- Color balance, Reading histogram, White balance and Color temperature.
- Perceptual Control, Effect of camera to subject distance, oblique angles, Depth of field and circle of confusion, Parallax Error
- Framing Views, Distortions, Composition, Applying the law of thirds
- Origins of architectural photography, Review of architectural photographs, Light and Shades

Module 2: Creativity in Shooting**Learning Strategies:**

- Lectures and Discussions
- Introducing Digital Photo editing tools
- **Suggested Exercises:** Photography Exhibition on a theme that is related to the B.Arch. Degree Course- Object photography, Architectural Photography, Urban Photography

Module Contents:

- Understanding light and photography, External lighting- Direction of lighting - front, side, back, shadows, texture, and effects of clouds,
- Light modification, psychological effects, and types of artificial lighting, combined daylight and flash.
- Architectural photography- Interiors and Exteriors, Object photography, Photo documentation of architectural models.
- Communicating ideas through photography, Experimental manipulation. Photographic illustration. Double Exposure, Various trends in photography
- Overview of architectural photography, Color balance, Reading histogram, White balance and Color temperature.
- Finding Forms and Shapes, Elements and Principles of framing, Rules of composition, Aesthetic of framing and composition
- Perceptual Control, Depth of field and center of confusion

Module 3: Post production**Learning Strategies:**

- Lectures and Discussions
- Workshops
- Labs

III	I (c)	19AR03008(B)	Elective Workshop I: Carpentry and Welding	1		2	2	50	50		100
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Course Overview:

This course provides students with an opportunity to learn carpentry and welding skills in repair and fabrication. Woodworking and welding workshop practice is a course designed to introduce students to general woodworking and welding practices. Students will expand their knowledge and experience through various projects, lessons, and vocabulary. Students will be expected to learn about and safely use hand tools, power tools, woodworking and welding machineries. The projects are designed to give students as much experience as possible by using many different machines and tools. The projects will also cover as many aspects of the building and woodworking industries as is possible in an entry levelcourse.

Course Outcomes:

Upon completion of the course, the student will:

- have woodworking and welding skills that will be useful in any aspect of the construction industry.
- have a broader understanding of construction processes as well as more in-depth problem-solving skills

Module 1: Introduction to Carpentry

Learning Strategies:

- Workshops andlabs

Module Contents:

- Need for the Work, Training, Relationship between timber, Tools andCarpentry
- Timber: Origin Structure of Timber, Types of wood conversion of timber, Types of sawing, Timbersections,
- Defects in wood: Seasoning of timber, Preservation, Types of preservatives, Other types of timber.
- Carpentry Tools: Classification of Tools, Measuring and Marking, Holding, Cutting, Grooving, Planning, Striking, Boring and Miscellaneous Tools, Care and maintenance of Tools, Precautions to be taken while using carpentry tools, sharpening tools, Wood working machines, Wood working lathe, Wood sawing machine,etc.
- Types of carpentry Work and Working Procedure: Marking, Sawing, Planning, Chiseling, Boring, Striking, Checking,Sharpening.
- Joints in Carpentry work: Classification, some associated terms, Lengthening/Widening Joints, Corner Joints, Framing Joints, Preparation of timber and making joint, Precautions in making ajoint.
- Nails, Screws, Dowels, Bolts and Nuts, Adhesivesetc.

Module 2: Introduction to Welding

Learning Strategies:

- Students may be encouraged to do Assembling projects that let them use their creativity.
- Students may design and make basic objects like a small shelf or a box, using wood and metal.
- The finished product shall be based on a design drawing meticulously prepared.
- They may estimate material requirements, create material lists and cutlists.
- The use of safety measures when working with tools may be ensured.

Module Contents:

- Define the welding process, welding terminology, and history of welding.
- Mechanical Properties of metal: Explain the mechanical properties of metals and their importance in welding processes.
- Welding Joints: Identify the five basic welding joints and welding symbols.
- Safety Demonstrate safe setup, operation, and shutdown of an oxy-fuel torch. Demonstrate safe setup, operation and breakdown of basic plasma arc cutting equipment. Explain the importance and use of ventilation
- Welding Work and working procedure: Welding Joints and Position, Basic Oxyacetylene Cutting, Basic SMAW/GMAW, Plasma Cutting

Reference:

- Engel, A. (n.d.). *Carpentry complete*. [Place of publication not identified]: Taunton Press.
- Finch, R. (n.d.). *Welder's handbook*.
- Hayward, C. (2009). *Carpentry for beginners*. Mansfield Centre, CT: Martino Pub.
- Ruth, K. (2004). *Welding basics*. Chanhassen, Minn.: Creative Publishing International.

Sem	Subject Group	Course Code	Subject	Hours/week			Credits	Marks			
				T	S	W/L		CA	University Exam		Total
									Jury	Written	
III	I (c)	19AR03008(C)	Elective Workshop I: Sculpture	1		2	2	50	50		100

Course Overview:

The course aims at introducing the art of sculpture, the associated skill sets and basic technical knowledge. This may be carried out as a studio-based course giving maximum freedom for creative exploration of the three-dimensional form. Students may create works of art as part of the studio, individually and in group, and the process may be considered as important as the product. They may present/ exhibit their work in a public platform and may be given opportunity to verbally express their work.

Course Outcomes:

Upon completion of the course, the student will:

- be enabled to express their idea of complex forms as three dimensional models
- be familiarized with properties of various materials and associated tools and processes involved.
- be creative freedom in the sculpture studio will help in explorations in architectural design
- develop team work skills and involvement in the community/society

Module 1: Introductory Discussions and Exercises

Learning Strategies:

- Lectures, workshops

Module Contents:

- Sculpture as an Art form, what is Art?
- Sculpture in history, Sculpture today
- Discussion on relationship between Sculpture and Architecture, 'Building as sculpture'
- Discussion using examples on how sculpture interacts with Building Interior, Nature landscape, Urban landscape
- Types of sculpture- based on materials, style, process etc. Additive and Subtractive processes, Carving, Moulding, Casting; Relief sculpture, Kinetic sculpture etc. Armature.
- Task 1: Basic form making exercises using Clay, Plaster of Paris, Wire mesh, Paper pulp, Foam board, Styrofoam, Wax, Wood etc.

Module 2: Exploring Materials and Techniques

Learning Strategies:

- Workshops and labs

Module Contents:

- Any of the 2 materials (minimum) given below shall be explored in the studio
- Terracotta: Theoretical understanding on Mixing of clay, Properties, Tools used, Possibilities and limitations, Methods in Pottery, working of a Kiln, understanding Ceramic and Porcelain, Finishes. Practical exercises to get familiarized with the material.
- Cement concrete: Theoretical understanding of Cement concrete, Properties, Types of reinforcements used, Possibilities and limitations, Tools used, Methods, Safety aids, Finishes. Practical exercises to get familiarized with the material.
- Fiber Glass: Theoretical understanding of the admixtures involved, Properties, Possibilities and limitations, Tools used, Making mould, Methods, Safety aids, Finishes. Practical exercises to get familiarized with the material.
- Metal- Steel/ Copper/ Bronze/ Tin: Theoretical understanding of the admixtures involved, Properties, Possibilities and limitations, Tools used, Methods, Welding, Soldering, Brazing, Safety aids, Finishes. Practical exercises to get familiarized with the material.
- Task 2: Making a Relief Sculpture / a table top sculpture individually. The final product shall be completed to a stage so that it can be exhibited in a Gallery. Terracotta, Cement concrete, Fiber glass, Metals etc. shall be used. The process shall be documented.

Module 3: Artistic Expression and Team Work

Learning Strategies:

- Workshops and labs

Module Content:

- Task 3: Making a Kinetic Sculpture in group/ Making an Assemblage in group. The final product shall be completed to a stage so that it can be exhibited in a Gallery. The process shall be documented.
- Task 4: Making an outdoor sculpture/ Installation (in the campus or outside the campus) and documenting the process. Any material shall be used. Upcycling shall be encouraged.

Reference:

- Rudolf Wittkower, "Sculpture: Processes and Principles", Penguin Books, 1991
- Karin Hessenberg, "Sculpting Basics: Everything You Need to Know to Create Fantastic Three-Dimensional Art", Barron's Educational Series, 2005
- Hal Foster and Richard Serra, "Conversations on Sculpture", Yale University Press, 2018
- Frederick Hartt, "Art: A History of Painting, Sculpture, Architecture", Harry N Abrams Inc, 1989
- Nancy Adajania...[etal.], "Vitamin 3-D: new perspectives in sculpture and installation", Phaidon, 2009
- Tristan Manco, "Raw + material = art: found, scavenged, and upcycled", Thames & Hudson, 2012