School Of Architecture

Board Of Studies

Minutes Of the Meeting

Meeting No:	**KLEF/ARCH/BOS/014**	**Date**	**01.07.2023**
Academic Year	**2023-24**	**Time**	**10:00 a.m. to 11.00 a.m.**
Venue	**E 218**		

The school of Architecture, KL University conducted 14th B.O.S. on Physical mode on 1st July 2023, from 10:00 a.m. onwards

The following internal members were present:

In chair: Ar. A. Priya

Members Present:

S. No	**Name**	**Designation**	**Department**
1	Ar. A. Priya	H.O. D	School of Architecture
2	Ar. Kiran Kumar Bonda	Dy. H.O. D and NAAC In charge	School of Architecture
3	Ar. Tanushree Das	Associate Professor, Academic I/C	School of Architecture
4	Ar. Sami Ur Rehman	Associate Professor	School of Architecture
4.	Ar. B.V. Lakshmi	Associate Professor	School of Architecture
5.	Ar. G. Vidya Sagar	Associate Professor	School of Architecture
6.	Ar. Shivendu Shekhar Singh	Assistant Professor	School of Architecture
7.	Ar. Harshitha	Assistant Professor	School of Architecture

The following external members were invited and present.

1	Dr. (Prof.) Janmejoy Gupta	Associate Professor and Dean – Research	School of Planning and Architecture, Vijayawada
2	Ar. Karanam Swaroop	Director	Nannapanei Associates, Guntur

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The following internal members from the Office of Dean academics were invited.

1. Dr. P.Vidya Sagar Associate Dean – Academics (Assoc.Prof- CSE)

Members Absent: Nil

Agenda and Resolutions

AGENDA ITEM- 1

Proposal of Courses Syllabus Revision and Introduction of New courses based on Stake holders feedback to 2023-2024 admitting batch curriculum	Recommended and forwarded to Academic council for Approval

1. Proposals by Faculty:

1. Ar. ITTA Rudhra Murthy has proposed **Revision of syllabus of Building services IV (23AR4126)** as the 4th CO of the subject is repetitive and to be removed. The course content from CO 1 to CO 3 to be distributed in 4 Cos

2. Ar. Shivendu Shekhar Singh has proposed **Revision of syllabus of Set Design (23AR4129B)** as the syllabus of set design is little extensive for B.Arch. students. It is to be restricted to set design for stage only. The set design for cinema to be removed from the syllabus.

3. Ar. Tanushree Das has proposed **Revision of syllabus of Disaster Mitigation and Management (23AR4234B)** as into include real issues pertaining to build environment rather than discussion on policies

3. Ar. B.V. Laksmi has proposed **curriculum modification for Vernacular Architecture (23AR3120A)** as there is no revision in the syllabus, however the subject will be taught in 4th semester instead of 5th semester as Professional Elective

4. Dr. P.Vidya Sagar Associate Dean – Academics has proposed **New Course on Gender and Social Equality(22UC0011)**

5. Ar.A.Priya has proposed **new course on Building Bye laws and Office Management (23AR3117)**

6. Ar. G. Vidya Sagar has proposed a **new course on Computer Studio-III (23AR3165)**

7. Ar. Tanushree Das has proposed a **new course Research Methodology (23AR4131)**

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2. Proposal by Parents:

1. Rvh Sriram, Father of Rojukhirdu Ridhima: 2200510006) has proposed to consider integrating more hands-on activities into the curriculum to enhance engagement

2. Koteswara Rao, father of Girish Chandra Bose (190160013) has proposed to include more practical components in the subjects taught

3. Proposal by Students:

1. Sai Gayatri (2100510002) has proposed to incorporate more hands-on practical exercises to Building services

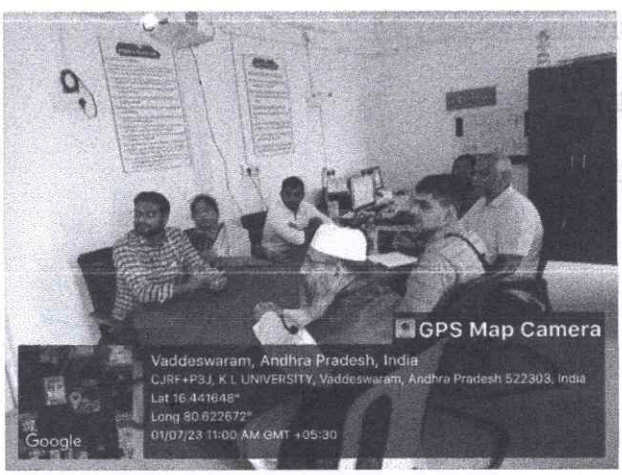
2. Harini Ejjarathi (2100510013) has proposed to teach Design of structures syllabus interactively

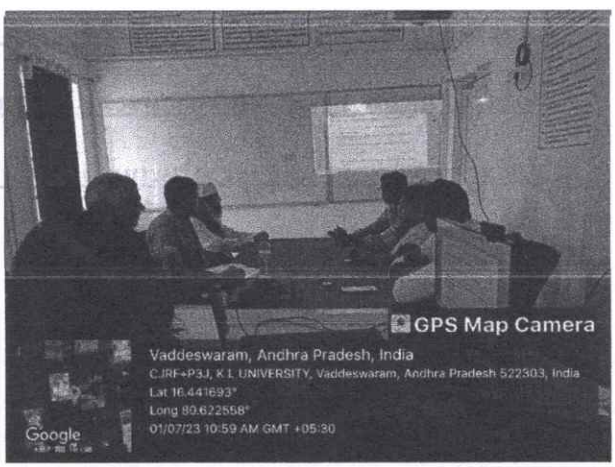
4. Proposal by Academic Peers:

1. Prasanna V. (Sr. Associate- Hill International) has proposed to 19AR4226: Building Construction and Management to include safety compliance and quality assurance alongside key aspects of time / cost parameters of Construction management

2. Jayakrishna Gutta (Associate Professor, VSAP, Vijayawada) has proposed to Addition of new building materials which are manufactured to replace certain materials like brick, stone etc and are being covered in Appropriate Building Technologies

Images of the meeting





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List of attendees:

S. No	Name	Designation	Signature
1	Ar. A. Priya	H.O. D	
2	Ar. Kiran Kumar Bonda	Dy. H.O. D and NAAC In charge	
3	Ar. Tanushree Das	Associate Professor, Academic I/C	
4.	Ar. B.V. Lakshmi	Associate Professor	
5.	Ar. Sami Ur Rehman	Associate Professor	
6	Ar. G. Vidya Sagar	Associate Professor	
7	Ar. Shivendu Shekhar Singh	Assistant Professor	
8	Ar. Harshitha	Assistant Professor	
9	Dr. (Prof.) Janmejoy Gupta	Associate Professor and Dean – Research	
10	Ar. Karanam Swaroop	Practising Architect	
11	Dr. P. Vidya Sagar	Associate Dean – Academics, KLU	

The detailed syllabi of Revised courses are shown in Annexure 1A

The detailed syllabi of new courses is shown in Annexure 1B

Detailed Y23 programme structure is shown in Annexure 1C

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Annexure 1(A)

Course Code	Course Name	Course Category	Existing Syllabus	Revised Syllabus	Topics Added/Removed/ Replaced	Change in Outcome	Justification for the Modification	*Overall Revision Percentage
23AR1206	Building Materials - II (cement, R.C.C, and Glass)	BSAE	CO1 :Understanding of the building materials - Cement and RCC. CO2 :Understanding of the building material - Steel. CO3 :Understanding of the building material - Glass. CO4 :Understanding of the building material - Paints.	CO1:Understand and relate Cement/RCC Building material CO2 :Understand and explain Steel Building material CO3 :Understand and distinguish different glass Building material CO4 :Understand different paints in Building material	All 4 CO's application of learning is introduced		Application of learning	25

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23AR2158	Building Constructio n - I (Masonry)	BSAE	CO1 : It is required that students should understand materials used in the building, method of construction and application CO2 :To understand the components of building and nuances of drawing plan, Elevation, and section along with relevant sketches and details showing method of construction CO3 :To understand, analyse the application and different arrangement styles of building materials CO4 :Students should be able to analyse the different construction methods and details of contemporary and traditional work method demonstrate the techniques through study models	CO1 :Understand the material stones, bricks and Soil: Types, Properties, Challenges. Bricks : Compositions, Classifications, Alternative Bricks Stone :Stone classifications, tests, uses, preservations, Artificial stones. Concrete: Masonry CO2 :Apply the knowledge about the techniques of masonry and draft the types of Stone masonry, brick masonry, and Concrete block masonry. Different masonry Walls, Foundations, Lintels and Arches. To understand the basic building components of the building i.e.: Foundation to parapet wall. To study the elements of the building and their importance, to understand the sequences of construction &structural system.	All 4 CO's are merged to 2 and application of those learning is introduced		Application of learning	25

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23AR2260	Building Construction - II (Joinery, trusses and staircase)	BSAE	CO1 :To understand the construction of doors and windows in accordance with the type of usage CO2 :To understand the uses of wooden trusses and staircases in construction industry/practice CO3 :To understand the installation of panelling, soundproof and light weight partitions CO4 :To understand the techniques of bamboo constructions and the construction techniques of wall and kitchen cabinets	CO1 :Understand the materials and its joinery: Timber, Bamboo. Understand the techniques, types of construction of wooden doors, windows, roofing. Understanding Cement and Concrete : Types, properties, tests, and applications in Doors, Windows, Roofing Understanding Ferrous and Non-ferrous materials(Steel): Types, properties, Applications in Doors, Windows, Roofing, CO2 :Apply the knowledge and draft the details of wooden & steel trusses ,RCC roofs, brick roofs, door and windows, wooden, RCC and Steel Roofs trusses as per construction industry/practice. Formwork, Shoring and Scaffolding : types and application	All 4 CO's are merged to 2 and application of those learning is introduced		Application of learning	25

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23AR3225A	Appropriate Construction Technologies	PE	CO1 :Familiarity with the alternative building materials, applying cost effective materials and techniques to resolve environmental issues CO2 :Familiarity with the indigenous construction materials and techniques for building resilience and disaster mitigation CO3 :Familiarity with the material and techniques for energy efficient building construction CO4 :Introduction to Building Information Modelling and application of the same in modern construction industry	CO1 :Understand the alternative building materials, applying cost. effective materials and techniques to resolve environmental problems. CO2 :Understand the indigenous construction materials and techniques for building resilience and disaster mitigation CO3 :Understand the materials and techniques for energy efficient building construction CO4 :Apply Building Information Modelling in modern construction industry	All CO's are revised and application of those learning is introduced		Application of learning	25

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23AR2157	Computer Studio - I (MS office, AutoCAD 3D)	SEC	CO 1: To understand the basics of computer system and their supporting technologies. CO2: To create documentation reports, analysis reports; and audio-visual presentations. CO3: To reciprocate the tools of 2D visualization to create architectural drawings. CO4: To create layouts, plot/print to scale drawings, design and edit 2D graphic images.	CO1: Understand the basics of computer system and their supporting technologies like MS Office. CO2: Apply the learned skills in preparation of documentation reports, analysis reports, and audio-visual presentations.	All 4 CO's are merged to 2 and application of those learning is introduced		Application of learning	25

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23AR2262	Computer Studio - II (Image making and 3d making software)	SEC	CO1: To understand interface, workspace, and utilization of tools of 3D modelling software apply the required tools and components in building a 3D model. CO2: To create documentation reports, analysis reports; and audio-visual presentations. CO3: To understand, visualize the space and apply the tools of BIM software, identify the need of tools of BIM software. CO4: To create a detailed 3D model by working in collaboration by application of advanced tools	CO1: Understand and learn to use of image editing software, graphics and animation software's. CO2: Apply the tools of sketch up or equivalent software to create a detailed 3D model by working in collaboration by application of advanced tools	All 4 CO's are merged to 2 and application of those learning is introduced		Application of learning	100

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23AR3116	Building Services - II (Electrical and Acoustics)	BSAE	CO1: Study of electricity, installations, wiring and principles of distribution and safety CO2: Know the application artificial illumination, and lighting design for various spaces CO3: Knowledge of air conditioning and ventilation principles evaluate electrical layouts CO4: Understanding properties of sound and Architectural acoustics, and analysing acoustic concepts and design, learning how to create acoustic and lighting designs to different building types – Studio work	CO1: Understand the planning techniques and study of electricity, installations, wiring, and principles of distribution and safety. CO2: Understand the application of artificial illumination and lighting design for various spaces CO3: Understand the knowledge of ventilation principles. CO4: Apply the properties of sound and architectural acoustics, applicability of acoustic concepts and design, and learning how to create acoustics and analyse the integration of all three services in architectural planning.	Studio Work is revised and limited to theoretical understanding		Application of learning	100

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23AR3221	Building Services - III (HVAC and fire safety)	BSAE	CO1: Familiarity with different air conditioning systems, their context of use and basics of planning involved. CO2: An understanding of fire safety, firefighting, fire prevention and installations in buildings. CO3: An understanding of mechanical transportation systems in a building and their design requirements. CO4: Ability to integrate services in buildings.	CO1: Understand the Thermal Properties of the building material and components and mechanical ventilation CO2: Understand the principles, systems, and design criteria of HVAC. CO3: Understand the techniques and concepts in fire safety norms in the buildings. CO4: Apply the techniques of mechanical transportation systems in building plans	All CO's are revised		Application of learning	100

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23AR4128C	Advanced Building Techniques	PE	CO1: Familiarity with the advanced construction techniques in RCC and their adoptability to architecture. CO2: Understand and apply various pre-engineered Concrete structures, adaptation in large span structures, pre-engineered Steel structures, adaptation in steel frames/space frames and their components. CO3: Understand and apply different aspects and technologies involved in the construction of High-rise buildings CO4:Introduction to advanced building materials and their application in the contemporary architectural practice	CO1: Understand and analyse practicing design of structural elements slabs, beams, columns, and foundations. CO2: Understand the Large Span Construction-flat slabs-shell structures, folded plates, portal frames space frame & trusses, tensile structures CO3: Understand the prefabricated construction & Pre-engineered building. New Material in Construction. Cold form sections, FRP CO4: Understand the Earthquake resistant construction design practices and analyse the Behaviour of structures during earth quacks.	All CO's are revised		Application of learning	100

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23AR4233B	Behavioural Architecture	PE	CO1: To study the activity related to Age groups in public place planning. CO2: To Understand the Behavioural Interface & Building systems in relation to this. CO3: To Understand the Behavioural Design process and execution to create evaluation methods. CO4: To study and Understand the Influence Behavioural Architecture on Urban Environment.	CO1: Understand concepts and concerns of perception. Identify and develop the sensitivity to the needs of users and clients CO2: Understand the designing and planning for urban quality CO3: Understand and apply the macro and micro built environment and behavioural aspects CO4: Apply the relationship between built - environment and perception	All CO's are revised		Application of learning	100

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23AR1204	Design of Structures - I (Plane trusses, shear force and bending moments)	BSAE	CO1 Understand the structural elements & different engineering material properties CO2 Analyse the forces in members of trusses CO3 Understand the bending moment and shear force in the members subjected to loads CO4 Understand the bending and shear stresses in structural members	CO1 Understanding the concept of simple stresses and strains and elastic properties of solids CO2 Analysing determinate beams and plotting shear force and bending moment diagrams CO3 Analysing indeterminate beams and plotting shear force and bending moment diagrams CO4 Understanding the theory of simple bending	All CO's are revised		Application of learning	100

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23AR2107	Design of Structures - II (Design of beams and columns)	BSAE	CO1 Understand the structural elements & different engineering material properties CO2 Analyse the forces in members of trusses CO3 Understand the bending moment and shear force in the members subjected to loads CO4 Understand the bending and shear stresses in structural members	CO1 Understanding the concept of simple stresses and strains and elastic properties of solids CO2 Understanding the properties of structural timber and bamboo CO3 Design of flexure members of timber and design of simple truss. CO4 Understanding of centre of gravity and moments of inertia and its impact on the structures.	All CO's are revised		Application of learning	100

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23AR2211	Design of Structures - III (Design of footings)	BSAE	CO1 Developing the design of structural components with timber. CO2 Developing the design of steel connections using bolted and welded connections CO3 Developing the design of steel tension members CO4 Developing the design of steel compression members	CO1 Understanding of Basics of RCC design CO2 Understanding and designing of columns CO3 Understanding and designing of footings and staircases CO4 Understanding and analysis a given section for under or over design and load carrying capacity	All CO's are revised		Application of learning	100
23AR3115	Design of Structures - IV (Detailing of structural member)	BSAE	CO1 Understanding the concept of limit state design of R.C structures CO2 Developing the design of reinforced concrete beams CO3 Developing the design of reinforced concrete columns CO4 Developing the design of reinforced concrete slabs	CO1 Understanding of limit state design. CO2 Analysis and Design of reinforcement for a section CO3 Design & detailing of one way and two-way slab. CO4 Detailing for special structures such as deep beams, corbels, shear walls etc.	Three Co's are revised		Application of learning	100

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23AR3225B	Energy Efficient Building	PE	CO1: To understand the need for architectural solutions for energy consumption. CO2: To classify various techniques for passive heating CO3: To classify techniques for passive cooling and the exemplify the need for natural ventilation CO4: To interpret the upcoming trends in solving the energy problem through architecture	CO1: To understand the importance of energy efficiency in buildings and strategies involved. CO2: To understand the importance of relevance of water in built environment CO3: Introduction to green rating systems and building codes CO4: Introduction to simulation and analysis software	All CO's are revised		Application of learning	100

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23AR4126	Building services IV	BSAE	Co1: Building Automation Systems & Controls: Philosophy. Introduction to System configuration, system modules, distributed systems, communication protocol and on-line measurements. Fire protection, security, and energy management. Control objectives. Sensors, controllers, and actuators. Understanding the concept of Microprocessor based controllers & digital controls. Examples of sub-systems such as - Digital Addressable Lighting Interface (DALI) and how it's useful to Architects. Co2:Communication and Security Systems: Voice communication systems, local area network, wireless LAN, Digital TV, CCTV, digital CCTV, teleconferencing, cellular phone system, and CABD. SMATV. Data networking. Short- and long-haul networks. Wideband network. Office automation. Public address/sound reinforcement systems. Digital public address system. Modern security systems. Co3: Modern Intelligent Vertical Transportation Systems: Sky lobby, double-deck lifts, twin lifts, advanced call registration systems, large scale monitoring systems, applications of artificial intelligence in supervisory control, energy	Co1: Building Automation Systems & Controls: Philosophy. Introduction to System configuration, system modules, distributed systems, communication protocol and on-line measurements. Fire protection, security, and energy management. Control objectives. Sensors, controllers, and actuators. CO2: Understanding the concept of Microprocessor based controllers & digital controls. Examples of sub-systems such as - Digital Addressable Lighting Interface (DALI) and how it's useful to Architects. Co3: Communication and Security Systems: Voice communication systems, local area network, wireless LAN, Digital TV, CCTV, digital CCTV, teleconferencing, cellular phone system, and CABD. SMATV. Data networking. Short- and long-haul networks. Wideband network. Office automation. Public address/sound reinforcement systems. Digital public address system. Modern security systems. Co4: Modern Intelligent Vertical Transportation Systems: Sky lobby, double-deck lifts, twin lifts, advanced call registration systems, large scale monitoring systems, applications of artificial intelligence in supervisory control, energy	CO4: REMOVED Integration Of Services into Architectural Design: Introduction to Smart Building concept. Integrating the technologies and systems, impact of information technology on buildings and people. Shared tenant services. Interaction and integration between building structure, systems, services, management, control, and information technology. Different Application & Design software available.		CO4 is repetitive.	25

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			saving measures related to lift systems/escalator systems, other modern vertical transportation systems, such as: gondola systems, materials handling systems, etc. CO4:Integration Of Services into Architectural Design: Introduction to Smart Building concept. Integrating the technologies and systems, impact of information technology on buildings and people. Shared tenant services. Interaction and integration between building structure, systems, services, management, control, and information technology. Different Application & Design software available.	saving measures related to lift systems/escalator systems, other modern vertical transportation systems, such as: gondola systems, materials handling systems, etc.				

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23AR4129B	Set Design	PE	CO1: Dance/ Drama/ Lecture/ Theatre: Background study of the Event Scenario. Historical Evolution of the stage, degree of encirclement in various types of stage designs such as open air, arena, thrust in and proscenium stages, Script and story board, Terminology and Theory of Stage Design, Technical aspects like Sound, Lighting and Colour scheme, Visualization of and creation of sets e.g., with backdrops and scenery, set design with appropriate props, costume design, and make up, Expenses. CO2:Film Set Design: Film set designs with response to camera positioning and movement, Indoor and outdoor shooting, Film sets as a creation of virtual environment appropriate for the scenery and shots, Support structure for film set erection for indoor and outdoor shooting, Architects role in cinematography: visualization, story board frames, Proportions, Computer generated stage set up: Mixing and editing, Exploring various materials of stage props, Budget. CO3: Set Layout: Principles of layout for creating effective visual signage and explore the unique problems, technique, theory, and approaches of signage in film,	CO1: Dance/ Drama/ Lecture/ Theatre: Background study of the Event Scenario. Historical Evolution of the stage, degree of encirclement in various types of stage designs such as open air, arena, thrust in and proscenium stages, Script and story board, Terminology and Theory of Stage Design, Technical aspects like Sound, Lighting and Colour scheme, Visualization of and creation of sets e.g., with backdrops and scenery, set design with appropriate props, costume design, and make up, Expenses. CO2:Graphic Design and Typography for Exhibit Design Principles of layout for creating effective visual signage and exploring the unique problems, technique, theory, and approaches of signage in film, theatre, and other forms of mediation exhibition. Introduction to the design applications for building signage. CO3: Set Layout: Principles of layout for creating effective visual signage and explore the unique problems, technique, theory, and approaches of signage in film, theatre, and other forms of mediated exhibition. Introduction to design application for building signage.	CO2: Film Set Design: Film set designs with response to camera positioning and movement, Indoor and outdoor shooting, Film sets as a creation of virtual environment appropriate for the scenery and shots, Support structure for film set erection for indoor and outdoor shooting, Architects role in cinematography: visualization, story board frames, Proportions, Computer generated stage set up: Mixing and editing, Exploring various materials of stage props, Budget. REPLACED with CO2:Graphic Design and			25

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			theatre, and other forms of mediated exhibition. Introduction to design application for building signage. CO4: Tabletop Set Up: Stop motion Animation and computerized animation, Concepts or story, Tabletop miniature box model, Lighting and special effects, Voice over, music and mixing, Overall editing and final presentation, Costing. Event Stage: Concept and design, Ambience lighting and special effect, Stage props: Video wall presentation, sound and acoustics, Cost, and estimation.	CO4: Tabletop Set Up: Stop motion Animation and computerized animation, Concepts or story, Tabletop miniature box model, Lighting and special effects, Voice over, music and mixing, Overall editing and final presentation, Costing. Event Stage: Concept and design, Ambience lighting and special effect, Stage props: Video wall presentation, sound and acoustics, Cost, and estimation.	Typography for Exhibit Design Principles of layout for creating effective visual signage and exploring the unique problems, technique, theory, and approaches of signage in film, theatre, and other forms of mediation exhibition. Introduction to the design applications for building signage.			

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23AR4234B	Disaster Mitigation and Management	PE	CO1: Introduction: Disaster Management & its necessity; Types, characteristics, causes & impacts; Natural disasters, Manmade disasters, Epidemics; Institutional & Legal arrangement; NDMA; Financial arrangement; Role of Architect at all stages of Disaster Management. CO2: Disaster Prevention & Mitigation: Risk Assessment & Vulnerability Mapping; Long-term measures; Review & revision of building byelaws & codes; Hospital Preparedness; Retrofitting; Mitigation strategies, Trigger Mechanism; Capacity building; Awareness programs. Architectural Design considerations. CO3: Disaster Preparedness: Forecasting & Early Warning Systems: Plans of action for probable disasters; emergency, medical, casualty management systems; Resources needed; Training, Simulation & Mock Drills; Partnerships for Mitigation & Preparedness; Audit of buildings & infrastructure; Architectural. CO4: Design considerations. Response: Role of various agencies; Standard Operating Procedures (SOPs); Levels of Disasters; Incident Comm& System (ICS); First & Other Key Responders; Medical Response; Information & Media	CO1: Introduction to basic definitions: Hazard, Risk, Vulnerability, Disaster, Coping Capacity Factors causing disasters, Classification of Disasters – Natural, Manmade, Low, Medium and High Impact Overview of Disaster Management scenario in India. CO2: Overview of the impact of various types of disasters on the built environment. Behaviour of structural and non-structural building components in case of disaster, simulation studies Design guidelines and norms for risk reduction for various disaster scenarios Site Planning, Building geometry and form, Structural Engineering, Landscape Building Repair and Retrofitting measures CO3: Earthquake Resistant and cyclone resistance measures in design and planning of buildings Local practices: traditional regional responses, provisions of National Building Code Earthquake resistant construction details for Foundations, soil stabilization, retaining walls, plinth fill, flooring, walls, openings, roofs, terraces, parapets, boundary walls, underground and overhead tanks, staircases, and base isolation of structures; introduction to IS codes. Cyclone-resistant buildings: general guidelines CO4: Disaster	All Cos have been modified			100

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			Partnership; Search & rescue; Architectural Design considerations. Relief & Rehabilitation: Temporary Relief Camps; Management of Relief Supplies; Provision of Intermediate Shelters; Relocation & reconstruction, repair & retrofitting of buildings & infrastructure; Socio-cultural-economic considerations; Capacity building for self-help construction; training & awareness programs. Architectural Design considerations.	Management - strategies, policy, framework Risk Assessment, Vulnerability mapping, Risk prevention, Mitigation Emergency Preparedness and Response, Recovery Case studies to illustrate the above				

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Annexure 1B: New Courses

23 AR 1206: Building Materials - II (cement, R.C.C, and Glass)

L-T-P-S: 2-0-0-0 **Credit: 2**
Prerequisite: Nil

Mapping of Course Outcomes

CO	Course Outcome	PO/PSO	BTL
CO1	Understanding the building materials -Ferrous &Nonferrous metals	PO1	2
CO2	Understanding of the building materials – Cement mortar and concrete & Reinforced cement concrete.	PO1	2
CO3	Understanding of the building material - Glass.	PO1	2
CO4	Understanding of the building material - Paints.	PO1	2

Properties and behaviour of both natural and man-made building materials such as metals, glass, steel and finishing materials in contemporary buildings; Application of these materials in construction; Effects of sun, rain, wind, and other climatic and environmental conditions on various building materials and built environment and the science of design for creating effective human comfort conditions within the built environment.

Syllabus:

CO1: FERROUS & NON-FERROUS METALS

FERROUS METALS: Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: structural steel, stainless steel, steel alloys –Their application in building industry.

NON-FERROUS METALS –: Properties and uses of aluminum, zinc, lead, copper etc., Their application in building industry.

CO2: CEMENT MORTAR AND CONCRETE & R.C.C

CEMENT MORTAR AND CONCRETE: Introduction to Cement mortar and concrete and its constituents and aggregates; Properties and uses, methods of preparation & handling. Study and application of different mortars and concretes. Grading: Importance, fineness modulus, water cement ratio, mixing, placing, and curing.

REINFORCED CEMENT CONCRETE:

Introduction to R, C.C and its constituents and aggregates; Properties and uses, methods of preparation & handling. Study and application of different types of R.C.C.

CO3: GLASS

Composition of glass, brief study on manufacture, treatment, properties, and uses of glass. Typesof glass - float glass, cast glass, glass blocks, and foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in building industry, glazing and energy conservation measures.

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CO4: PAINTING, VARNISHING& MISCELLANEOUS MATERIALS:

Painting: Characteristic of an ideal paint, types of paints, defects in painting, painting on different surfaces. Varnishing: Varnish types, Process of varnishing. Miscellaneous materials like Epoxy, Melamine, Putty, Foams, Bitumen etc.,

Textbooks:

1. S.C.Rangwala, "Engineering Materials", Charotar Publishing House, India, 1997.
2. S.K Duggal, "Building Materials", Oxford and IBM Publishing Co, Pvt. Ltd., 1997.
3. P.C Varghese, "Building Materials", Prentice Hall of India Pvt. Ltd., New Delhi, 2005

Reference Book:

1. Arthur Lyons, "Materials for Architects and Builders", An introduction Arnold, London, 1997.
2. Don A.Watson, "Construction Materials and Processes", McGraw Hill Co., 1986.
3. S.N Sinha, "Reinforced Concrete Design", Tata-McGraw Hill, New Delhi, 2002
4. Howard Kent Preston, "Prestressed concrete for Architects and Engineers", McGraw Hill, New York,1964

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23AR2158: Building Construction - I (Masonry)

L-T-P-S: 0-0 -4-0 **Credits: 4** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO	Course Outcome	PO/PSO	BTL
CO 1	to understand natural materials like stone used inthe building construction, method of construction and its application & usage in building industry & types of masonry, it's systems & techniques.	PO6,	2
CO 2	To understand the brick as basic building material &application of clay products in construction sector, methods & techniques.	PO6	2
CO 3	To understand the basic building components of the building i.e.: Foundation to parapet wall. To study the elements of the building and their importance, to understand the sequences of construction &structural system.	PO6	4
CO 4	Students should be able to analyze the different types of brick masonry & construction methods and details of contemporary and traditional work method demonstrate the techniques through study models	PO6	4

Course outcome

Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of medium complexity using natural and manmade materials including foundation, walls, roofs, staircase, joinery, and finishes. The course will combine lecture, and studio exercises whose results will be in the form of drawings and models, culminating in a studio which will translate an architectural *design into working drawings which are good for construction in manual/ digital mode.*

Syllabus:

CO1

Stones: Geological Classification of rocks – test for stones, uses of stones, deterioration of stone, preservation of stones, stones available for construction in India their properties and uses. Stones for finishes – cutting & polishing – granite and marble. Artificial stone and their uses & types of stone masonry.

CO2

Bricks & Clay Products:

Bricks: Composition of good brick, properties and uses of bricks, classification of bricks, shape of bricks, fire bricks, and substitutes for bricks Clay products: Tiles, terra cotta, stoneware, earthenware, porcelain, and clay block their properties and uses, types of masonry systems.

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CO3

Basic Building Components, Foundation, Walls& roofs:

Basic building components: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs, Parapet & weathering course; Foundation: typical types of foundations in stone, brick & RCC. Walls: Details of walls section across the opening (door & window) Roofs: simple configurations and details of various forms of roofs (flat, slope pyramidical & dome). Basic building components: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs, Parapet & weathering course; Foundation: typical types of foundations in stone, brick & RCC. Walls: Details of walls section across the opening (door & window) Roofs: simple configurations and details of various forms of roofs (flat, slope pyramidical & dome).

CO4

Brick, Stone Masonry & different types of masonry systems:

Applications of brick masonry: Foundation, walling, types of brick walls, brick masonry (English, Flemish, rat trap bond) detailed brick layout at corners, junctions and brick piers, style of construction viz., exposed brick work, Reinforced brick walls, piers etc.

Brick Roofing: Types of brick roofs, Madras terrace roof, jack arch roof, brick arches and domes, reinforced brick roofs,Types of arches, vaults and domes, and construction of arches, vaults, and domes. Application of stone masonry: Foundation walling, types of different stone masonry (rubble & ashlar masonry), stone piers, arches, facing or cladding stone systems & composite masonry

Textbooks:

1. Harold B.Olin – Construction principles, Materials and Methods – IFE, Chicago, 1980.
2. Dr. B.C Punmia – Building construction
3. R. Chudley, construction Technology.

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23AR2260: Building Construction - II (Joinery, trusses, and staircase)

L-T-P-S: 0-0 -4-0 **Credits: 4** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO	Course Outcome	PO/PSO	BT L
CO1	To Understand the construction of doors and windows in accordance with the type of	PO1, PO3	2
CO2	To understand the uses of wooden trusses and staircases in construction industry/practice	PO1, PO3	2
CO3	To understand the installation of paneling, soundproof and lightweight partitions	PO3	2
CO4	To understand the techniques of bamboo constructions and the construction techniques of wall and kitchen cabinets	PO3	2

Course Outcomes

Traditional and conventional systems that enable construction of a complete building components; various components like doors, windows, paneling, partitions, staircase and trusses, and methods of construction and detailing of buildings of medium complexity using natural and manmade materials doors, windows, roofs, staircase & partitions showing the details of joinery and material finishes; To explore the students about the construction of contemporary buildings using various vernacular and contemporary structural systems and materials. The course will combine lecture, and studio exercises whose results will be in the form drawingsand models, culminating in a studio which will translate an architectural design into working drawings which are good for construction in manual mode.

Syllabus:

CO1

Timber-Joinery: Methods of construction using natural timber in joinery works including methods of fixing and options for finishing of doors &windows-terms associated &positioning. Windows (paneled, louvered, glazed and sliding windows) - Doors (paneled, glazed, sliding, sliding/folding, louvered and pivoted) – Ventilators (top hung, bottom hung, pivoted, louvered, and glazed.

CO2 :

Floors, Trusses, and Staircases: Methods of construction using natural timber in various structural components of the building such as floors, walls, and roof trusses - Exercises involving the above through case studies - Types of timber staircases. Methods of making wooden floors different types of trusses Methods of construction of timber staircases- Basic principles and design details including detailing of handrail and baluster- Exercises involving the above through drawings.

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CO3:

Partitions and Paneling: Methods of construction using man-made timber products such as ply woods, block boards, MDF, etc., in fixed partition, sliding/folding partitions, wall paneling. - Exercises of the above through drawings and case studies.

CO4:

Bamboo and Other Materials: Design and Construction Techniques using bamboo for building components for small scale buildings likesnack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies Cane, gate, coir, coconut - Growth, Form, Shape, Roofingmaterials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.

Furniture and Fitments

Showcase and Shelf: Methods of making the TV Shelf, showcase and dressing wardrobe. Cupboard & cabinet:kitchen cupboards and wall cabinets showing the details of joinery and material finishes

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23AR1204: Design of Structures - I

(Plane trusses, shear force and bending moment)

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Familiarize the students about the architecture and structural engineering interface. Understanding the concept of forces and structural systems.	PO1	2
CO2	Analysing the plane trusses	PO3	2
CO3	Understanding of shear force and bending moments in column. Determination of deflection of beams	PO3	4
CO4	Understanding of centre of gravity and moments of inertia and its impact on the structures.	PO3	4

Syllabus:

CO1: Introduction to Forces and Structural Systems:

Process of building structures. Broad categorization of structural systems. Basic requirements of structure. Force and its units, Laws of forces, Resultant of a Force System, Law of Inertia, Law of action and reaction, Free body diagram, Static equilibrium & conditions of equilibrium, conditions of statically determinacy, Degree of Indeterminacy. Types of supports and support reactions, Determination of support reactions for statically determinate structures, Analysis of forces, moments, and couples in structures.

CO2: Analysis of a perfect truss by method of joints and method of sections. Simple stress and strains, elastic constants, stress strain curves, relationship among elastic constants. Study of beams with different types of support conditions and different types of loadings. BIS 875 code for estimation of design loads in a building.

CO3: Shear force and shear force diagrams, bending moment & Bending moment diagrams for determinate beams, Sagging and Hogging Bending Moments, Sign Convention, Point of contra-flexure and determination of its location. Flexural and shear stresses under bending, Determination of deflection in the beams (only formulae to be told, no derivation) Deflected shapes of the beams.

CO4: Centre of Gravity and Centroid and its determination for a plane lamina. Moment of Inertia and its determination for a plane lamina, Parallel Axis theorem and Perpendicular Axis theorem.

Textbook:

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

References:

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

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23AR2107: Design of Structures – II
(Design of beams and columns)

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understanding the concept of simple stresses and strains and elastic properties of solids	PO2	2
CO2	Understanding the properties of structural timber and bamboo	P02	4
CO3	Design of flexure members of timber and design of simple truss.	PO3	4
CO4	Structural properties of brick masonry and analysis	PO3	2

Syllabus:

CO1: Simple Stresses and Strains: Introduction to structural elements. Types of engineering materials, their mechanical properties, and the tests for determination of the same. Study of a section subjected to pure bending, Neutral Axis, Moment of Resistance and Section Modulus. Stress and Strains; stress strain diagram for mild stee and high tensile steel and concrete Elastic constants and their mutual relationships; Simple redundant problems of stresses and strains.

CO2: Properties of Structural Timber, Defects of timber and their impact on structural properties of timber, permissible stresses in timbers and modification factors. Classification of timber, Introduction to IS Code of Timber Construction – IS: 883. Introduction to Bamboo as structural material

CO3: Analysis and Design of flexural members of timber. Built up beams and flitched beams. Analysis and Design of timber columns; Solid columns and built-up columns. Design of members of a simple truss.

CO4: Brick as a structural material, Design of a load bearing brick wall and wall footing. Types of masonry used as structural system for building structures. Structural properties of brick masonry and analysis and design of low-rise masonry buildings including masonry foundation

Textbook:

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

References:

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

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23AR2211: Design of Structures - III
(Design of columns and footings)

L-T-P-S: 3-0 -0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understanding of Basics of RCC design	PO1, PO3	3
CO2	Understanding and designing of columns	PO1, PO3	3
CO3	Understanding and designing of footings and staircases	PO1, PO3	3
CO4	Understanding and analysis a given section for under or over design and load carrying capacity	PO1, PO3	3

Syllabus:

CO1: History of reinforced concrete structures and philosophy of limit state design Understanding the codal provision. Analysis and design of reinforced concrete beams, slabs.

CO2: Introduction to columns: short columns, slender columns, uni-axial behavior, and bi-axial behavior. Designing the same.

CO3: Introduction to types of footings and analyzing and designing the isolated footing with axial load and moment. Introduction to the types of staircases and analyzing and designing the dog legged staircase.

CO4: Under Reinforced, Balanced and Over-Reinforced sections: Formulation, Analysis of a given section and determination of moment of resistance/load carrying capacity. Design under shear, bond and development length, Analysis & Design of a doubly reinforced RC beam, Continuous and Cantilever Beams.

Textbook:

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

References:

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

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23AR3115: Design of Structures – IV
(Detailing of structural member)

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	*Understanding of limit state design.*	PO2	2
CO2	Analysis and Design of reinforcement for a section	PO2	3
CO3	Design & detailing of one way and two-way slab.	PO3	3
CO4	Detailing for special structures such as deep beams, corbels, shear walls etc.	PO3	3

Syllabus:

CO1: Introduction, general requirements for structural detailing in concrete, simple theory, steel for reinforcement, general rules for detailing. Concept of Limit state Design, Characteristic strength of steel and concrete, Loads and Loading conditions, Limit state of Collapse and Serviceability.

CO2: Analysis and Design of reinforcement for a section subjected to torsion, Side face reinforcement. Design and Detailing of a lintel beam & lintel with sunshade. Analysis & Design of Flanged Beams

CO3: Analysis of slabs spanning in one direction and spanning in two directions. Design & Detailing of a one-way slab, Design & Detailing of a cantilever chajja. Design & detailing of a two-way slab.

CO4: Detailing for special structures such as deep beams, corbels, walls, shear walls, underground and overhead water tanks, chimneys, bunkers and silos, piles, and pile caps

Textbooks:

1. B.C. Punmia, "Reinforced Concrete Structures", Vol.1&2, Laxmi Publications, Delhi,2004.
2. IS 456, "Indian Standard, Plain and Reinforced Concrete", Code of Practice, Bureau of Indian Standards, 2000.
3. SP-16, Design Aids for Reinforced Concrete to IS 456 NBC of India, 1983
4. IS 1905, Code of Practice for Structural Safety of Buildings, 1987.

References:

1. Dass, M. M. *Structural Analysis*. New Delhi: PHI Learning.
2. Jindal, R. L. *Elementary Theory of Structures*.
2. Junnarkar, S. B. (1997). *Mechanics of Structures*. Vol. II. 22nd Ed. Charotar Publishers.
3. Punmia, B. C., Jain, A. K. and Jain, A. K. (1992). *Theory of Structures*.9th Ed. New Delhi.

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23AR3117: Building Bye Laws and Office Management

L-T-P-S: 2-0-0-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/ PSO	BT L
CO1	To understand the importance of Building codes in different zones and learning about the terminologies	PO1	2
CO2	To learn the different norms from National Building Code of India	PO1	2
CO3	To learn the basic need of building bye laws of local region and to learn the terminology. To be introduced to Energy Conservation Building Code.	PO1	2
CO4	To learn basis office procedure and management techniques in *architecture*	PO8	2

CO1:
Introduction to building codes and norms: Introduction to Building codes, bye laws and regulations, their need and relevance. Overview of basic terminologies, nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas, etc.

CO2:
Study of building regulations: Study of structure of Building bye laws, National Building Code etc. General building requirements, building classifications and permissible uses. Norms for exterior and interior open spaces, setbacks and margins, norms for building projections in open spaces, considerations in FAR, guidelines for open green areas. Plinth, habitable rooms, kitchen, wet areas, mezzanine, storerooms, elevated parts like chimneys, parapets etc. Means of access, norms for access widths for various types of buildings, requirements of parking spaces, Equivalent Car Space (ECS), standards for turning radius, access to service areas.

CO3:
Study the Role and functions of the administrative and Development authorities- Vijayawada Municipal Corporation, CRDA (Capital Region Development Authority) etc and the local regulations for building permissions, architectural control and provision of building services, regulations for super structures, building height regulations, regulations for multi storied buildings etc. Introduction of Energy Conservation Building Code (ECBC): Eco Niwas Samhita 2018, Part I and Eco Niwas Samhita 2021 (code compliance)

CO4:
Office management: Architectural office, architect, contractor, client relationships Office correspondence, filing and record keeping Human resource management. Scale of charges

Textbooks:

1. Handbook of Professional Documents 2020, by Council of Architecture, India
2. Model Building ByeLaws 2016, Municipal Administration and Urban Development Department

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23AR3120B: Sustainable Architecture

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/ PSO	BTL
C01	*To understand the fundamental and basic concepts of sustainable* architecture	PO2, PO7	2
CO2	To understand the sustainable site planning and sustainable and socially responsible urbanism	PO2, PO7	2
CO3	To understand about the energy conservation, renewable and non-renewable energy	PO2, PO7	3
CO4	To learn about the sustainable building materials, conservation of water and waste management	PO2, PO7	3

Syllabus:

CO1:

Fundamentals of Sustainable Architecture : Characteristics of sustainable architecture, fundamentals of passive designing and climatology, thermal comfort, visual comfort, acoustic comfort, Climate Consultant Concepts and Terminology of Sustainable Architecture - Sustainable buildings, parameters of sustainable buildings, Green buildings definitions and categories, indicators of green buildings rating systems, Terminologies related to sustainable buildings- carbon footprint, life cycle analysis,, Urban Heat island, Development Footprint.

CO2:

Sustainable site planning : Site assessment and selection: topography, vegetation, built form, water, access to natural light, local wind patterns and micro climate; Site planning: layout, shape, spacing, orientation, mutual relationship, solar studies, pollution prevention and ecology, heat island effect Design for environment: Greenfield development, smart growth, brownfield redevelopment strategies and infill development, sustainable urbanism Socially responsible design: user-centered design, design education/ethics and sustainability.

CO3:

Energy: Forms of energy, energy sources: renewable and non-renewable, energy conversion: cogeneration and fuel cells Solar Energy: low temperature thermal systems (active & passive systems, solar air conditioning, solar water heating), high temperature thermal systems (solar thermal electricity system), photovoltaic systems, BPVs Wind Energy: traditional wind mills, wind turbines – HAWT and VAWT (SWOC analysis), Other renewable energy: methane gas (waste), energy crops (biomass conversion), sea and earth (geo-thermal) Energy Storage: reversible chemical reactions, phase change materials.

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CO4:

Materials, water, and wastes: Building Materials: embodied energy of materials, renewable materials, reuse of materials Water efficiency: water use/ demand, quality of water, water conservation, ground water recharge Waste management: gaseous wastes, liquid wastes, solid wastes, recycling systems Contemporary exemplars of sustainable architecture. Energy efficient Building, Energy Modeling, and energy audit.

Textbooks:

1. Thomas, Randall & Fordham Max Sustainable urban design: an environmental approach" 2003.
2. Edwards, Brian and Hyett, Paul Rough guide to sustainability 2001.
3. Langston, Craig A. and Ding, Grace Sustainable practices in the built environment 2001.
4. Giovani Baruch, "Passive and Low Energy Cooling of Buildings",VNR, New York, 1994.
5. Mackenzie Dorothy, "Green design: design for the Environment", Laurence King, London, 1997.

Reference book:

1. Farmer John & Richardson Kenneth, "Green Shift: Changing attitudes in architecture to the Natural World", Architectural Press, Boston, 1999.
2. The European Commission, "A Green Vitruvius: Principles and Practices of Sustainable Architectural Design", James & James, London, 1999
3. Gray, O., Robinetle, "Landscape Planning for Energy Conservation", Van Nostrand Reinhold, New York, 1984.

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23AR4131: Research Methodology

L-T-P-S: 2-0-0-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/ PSO	BT L
CO1	To learn the fundamentals of research methodology	PO1	2
CO2	To learn the fundamentals of quantitative research techniques	PO4	2
CO3	To learn the fundamentals of qualitative research techniques	PO4	2
CO4	Ability to written and verbal presentation	PO4	2

Syllabus:

CO1: Fundamentals of Research Introduction to research, types of research, research methods: qualitative, quantitative, and mixed measures Elements of research, research methodology, characteristics of good research, selection of appropriate research design, planning the research: problem statement, literature review, critical thinking, types of hypotheses, types of samples, methods of data collection, data analysis, research proposal preparation

CO2: Quantitative Research in Architectural Design Development Data collection, tools of data collection, Types of research survey, questionnaires Introduction to Statistical analysis of data and graphical representation. Statistical theories: regression analysis, factor analysis and multivariate analysis

CO3: Qualitative Research in Architectural Design Development Interviews in research, observation, physical traces, archival research Case studies in architectural research Applied research in architectural design

CO4: Report Writing and Presentation Introduction to report and research paper writing- components of research paper and research report Introduction to different styles of referencing - Harvard and Chicago styles Presentation techniques: oral presentation, layout, printing process, internet, overhead, power point

Reference books:

1. Creswell, J. W. (2002) Research design: qualitative, quantitative, & mixed methods approach. Thousand Oaks, Sage.
2. Denscombe, M (2003) The good research guide: for small-scale research projects. Oxford University Press, London.
3. Dwivedi, R. S. (2001) Research Methods in behavioral science, McMillan, New Delhi.
4. Graziano, A. (1989) Research methods process of inquiry, Harper Collins Publishing New York.
5. Groat, L. and Wang, D. (2002) Architectural research methods, John Wiley publication, New York.
6. Harrigan, J. E. (1987) Human factors research methods, Elsevier, Amsterdam.

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23AR4128A: Housing

L-T-P-S: 2-0-0-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understand housing and Housing issues	PO1	2
CO2	Understand Housing, 5-year plans specific to housing and financial stakeholders.	PO3	2
CO3	Understand the various schemes related to Rural & Urban India.	PO4	2
CO4	Understand Planning- Physical, Administration, Socio-Cultural, Sustainable, Financial, Future forecasts, and Trends.	PO4	2

Syllabus:

CO-1:

Concept of shelter, timeline, Dynamics of housing (users, need & supply, terminologies), Migration, urbanization, scale, scope, types of housings, and ownership. Housing issues – Census data statistics on current, future housing demand challenges.

CO-2:

Five-year plans specific to housing. National & State policies; Sources of Finance – Banks, Finance agencies; Development control regulations; Government & Private agencies Participation in Housing developments, Schemes related to Public Private Partnership, Redevelopment etc.

CO-3:

Classification of users on base of income; Rural Housing Schemed in India like PMAY, etc; Urban Housing Schemes like VAMBAY, TIDCO, etc; Low-cost housing, mass housing, Affordable Housing, Analysis of housing schemes for Rural & Urban India. Attempts to overcome housing shortfall in India. Identifying the potential and alternative methodologies for housing (research Gaps).

CO-4:

Study of user profiles, Planning – Physical, Administration, Socio-Cultural, Sustainable, Financial, Future forecasts, and Trends. Contemporary solutions for housing like Bunker Houses, Prefab 3D printing, Tube houses, Container housing. Latest, futuristic technologies and research-based trends on basis of all sectors in the world. Writing a research paper in consideration of housing.

Textbooks:

1. Babur Mumtaz and Patweikly, *Urban Housing Strategies*, Pitman Publishing, London, 1976.
2. GeofreyK.Payne, *Low Income Housing in the Development World*, John Wiley and Sons,Chichester,1984.
3. *John F.C.Turner, Housing by people*, Marison Boyars, London, 1976.
4. Babur Mumtaz and Patweikly, Urban Housing Strategies, Pitman Publishing, London, 1976.
5. GeofreyK.Payne, Low Income Housing in the Development World, John

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Wiley and Sons,Chichester,1984.
6. John F.C.Turner, Housing by people, Marison Boyars, London, 1976.
7. Martin Evans, Housing, Climate and Comfort, Architectural Press, London, 1980.

Reference books:

1. Martin Evans, Housing, Climate and Comfort, Architectural Press, London, 1980.
2. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool,1983.
3. Bridging the Urban housing shortage in India, NAREDCO
4. *Report on trend and progress of Housing in India*
5. Revisiting Low Income Housing, A review of Policies and perspectives by PritikaHingorani
6. Housing Finance: A Study of Experiences of Commercial Banks by Dr. N.K Thingalaya, IndianInstitute of Banking and Finance, Mumbai
7. Housing and housing finance – A review of the links to Economic Development and poverty reduction by John Doling, Paul Vandenberg and Jade Tolentino, Asian Development Bank.
8. Urban Housing and Slums by A.K.Jain

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23AR4233A: Urban Design

L-T-P-S: 2-0-0-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO 1	To understand the theory of urban design and its relationship with architecture, urban planning, and the users.	PO2, PO4, PSO1	2
CO 2	To understand Users and Activities in a city	PO2, PO4, PO9	2
CO 3	To understand public spaces, streets & Transport	PO2, PO4, PO9	2
CO 4	To understand Application of Urban Design	PO2, PO4, PO9	2

Syllabus:

CO-1:

Introduction to urban design; relationship between urban design, urban planning, architecture & their role; terminologies; urban design as a multi-disciplinary field; identifying & analyzing stakeholders' role in the process of urban design. Users and activities in a city and their analysis; user needs and behavioral studies; socio-cultural and socio-economic aspects of people; memory and mental mapping.

CO-2: Urban Design Theories – Scope, Scale, Strategies, levels & legislation; "FIVE ELEMENTS" in a city; People- Centric Design and Public Participation. Urban morphology & Urban Character; Elements and aspects of Urban Design; Built & Unbuilt spaces; Buildings; Public spaces, streets & Transport; Pedestrianization& streetscape; Movement pattern; Services; Defensible Spaces; Environment and Urban Design. Livable cities, Jane Jacobs studies; Analysis of Gorden collen; Place making; Urban Conservation.

CO-3: Survey techniques- Evolution Analysis; Townscape analysis; Perpetual structure; Skyline; Watch tower concept; User group identification (mental, size & categories); Sense of belonging; Urban Street skeleton, Building densities; Universal Design aspects (phy. & Age); Permeability study (Privacy & Accessibility) & Visual Analysis; Constraints and possibilities; designing in a context and site planning; articulation of spaces; Flexibility, adaptability; Formulation of issues for intervention. Mapping of Urban areas – Building footprint, building heights, Scale & Proportion, Dead & Active spaces, Safety & Security, User mapping & movement study, User interaction with surroundings; Ecology of urban spaces; Nightlife.

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CO-4: *Application of Urban Design, Examples of Good Urban Design; New Urbanism, case studies* and contemporary urban interventions; Urban designs at corridors like Water bodies, Major roads, Railroads, Metro lines, etc.; Research studies on Urban Fabric, Environmental psychology; Safeguarding Urban design environment; Overcoming urban blights, poorly functioning Urban areas. Encouraging studies towards writing Research papers related to Urban Design.

Textbooks:

1. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool,1983.

Reference books:

1. The Death and Life of Great American Cities, Jane Jacobs.
2. Image of the city, Kevin Lynch.
3. By the City/For the City by ANNE GUINEY & BRENDAN CRAIN.
4. A New Theory of Urban Design, by CHRISTOPHER ALEXANDER, HAJO NEIS, ARTEMIS NNINOU & INGRID KING.
5. Urban Acupuncture by JAIME LERNER.
6. *Urban Design Since 1945: A Global Perspective,* DAVID GRAHAME SHANE.
7. *Happy City: Transforming Our Lives through Urban Design – Charles Montgomery*
8. Design with Nature – Ian McHarg

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23AR2223: Human Settlement and Planning

L-T-P-S: 2-0-0-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Familiarize the various elements of Human Settlements, the classification and Evolution and sustainment of Human settlements.	PO1, PO5	1
CO2	Understand familiarize the students with Planning concepts and process in Urban and Regional Planning.	PO1, PO7	2
CO3	Understand the changing dynamics of Urban Form and it's planning according to urban transformation & identifying the Research gaps in Settlement Planning.	PO3, PO9	2
CO4	Understand the development and role of planning body's role in India and encourage students to write Research papers with the knowledge acquired.	PO6, PO9	2

Syllabus:

CO 1:

Origin of Human Settlements: Theory of 'EKISTICS'. Elements of Human Settlements; Pattrick Geddes "Valley of Civilization", River Valley Civilizations, Factors influencing the growth and decay of human settlements. Type and classification of settlements – Urban and Rural (International & National level). Before and after the Industrial Revolution.

CO2:

Introductory study of the development of various settlement forms: Planning concepts and their relevance to Indian Planning practice – Ebenezer Howard (Garden City Concept), Patrick Geddes (Giddensian Triad), C.A Perry (Neighborhood Planning), Redburn Theory, Satellite Towns; Concept and Case studies. Town planning & Regional theories like Garden City, city beautiful movement, Linear city, Concentric circle theory, sectoral theory, Christeller weber central place theory, etc. City planning concepts envisioned by Architects like Le Corbusier, Frank Lloyd Wright, etc.,

CO3:

Urbanization: Fact, elementary theories and problems related to urbanization with social reference to India; Emergence of new forms of developments, Transportation, and communication – Potentials and limitations of roadways, Railways, Airways and Waterways in development of settlements; Problems and potentials. Sustainable usage of resources. Concepts of SMART cities, Utopian Cities, IOT facilities in Urban Planning, Modal Split, NMT, Pedestrianization of cities etc. ToD, Aeropolis, Linear cities, Livable Cities, etc.

CO4:

Brief Introduction to the town planning organization in India: Various levels of planning, National, Regional, Urban, Rural, Local etc. 73rd & 74th Amendments, differences, and relationships between them; Ecological, Social and Economic aspects of town planning in India; Definitions and terms in Indian context – Zonal plan, Master Plan, Land Use Plan, Development regulations, regional plans, etc. URDPFI & RADPFI guidelines. Concepts and their applicability in India, RURBAN, SAGY.

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Textbooks:

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

Reference Books:

1. Government of India, "Report of the National Commission on Urbanization", 1988.
2. Hansen N., "Regional Policy and Regional Integration", Edward Elgar, UK, 1996.
3. Sandhu. R. S., "Sustainable Human Settlements", Asian Experience, Rawat publications, 2001.
4. Gastek.P.,"Living Plans: New concepts for advanced housing", Brikhauser publications, 2005.
5. URDPFI Guidelines, MoUD, India.
6. RADPFI Guideline, MoPR, India.
7. The City of Tomorrow: Sensors, Networks, Hackers, and the Future of Urban Life – Carlo Ratti and Matthew Claudel.

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23AR4234A: Behavioural Architecture

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Identify concepts and concerns of perception. Identify and develop the sensitivity to the needs of users and clients	PO1, PO4	2
CO2	Understanding the designing and planning for urban quality	PO6, PO10	2
CO3	Identify and apply the macro and micro built environment and behavioural aspects	PO3, PO9	3
CO4	Analyse the relationship between built - environment and perception	PO3, PO9	4

Syllabus:

CO1:

Concepts And Concerns of Perception: Definition - Visual perception - perceptual constancy, objective and spatial vision, attention and awareness, methods of vision perception and science.

Developing Sensitivity to The Needs of Users and Clients Architectural assumptions and Environmental Designs, Designs and social practices, involvement of clients and user in Designs and built environment, realities of clients and public their impact projects and designs

CO2:

DESIGNING AND PLANNING FOR URBAN QUALITY: Quality of urban environment and living - past, present, and future trends, role of urban design in urban environment, planning for quality living in urban areas

CO3:

Macro And Micro Built Environment and Behavioural aspects: Relationship of built environment to society, spatial relationship within built - environment, influence of physical environment on human behaviour, influences of built environment on human behaviour

CO4:

Built - Environment and Perception: Case studies of tall buildings, low raise neighbourhoods, interior and exterior elegance of built environment, local and regional level landscape.

Textbook:

1. Parfeet M and Power G, planning for urban quality, Rent ledge, London 1977.
2. Johathan Batnett - Urban Design as public polody - Haxper and row Publications New York, 1983.

Reference Books:

1. Yantis. S (2001), Visual perception, Psychology Press, Philadelphia.
2. Nicol D and Pilling S (2000), changing Architectural education - Towards new
3. Frey H, (1999), Eand FN Spon, London.
4. Dovey K, (1999) Framing Places, mediating power in built form, Rent ledge, London.

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23AR3116: Building Services - II (Electrical, and Acoustics)

L-T-P-S: 3-0-0-0 Credits: 3 Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BT L
CO1	Study of electricity, installations, wiring and principles of distribution and safety	PO1,	2
CO2	Know the application artificial illumination, and lighting design for various spaces	PO3,	2
CO3	Knowledge of ventilation principles	PO3, PO9	2
CO4	Understanding properties of sound and Architectural acoustics, and analyzing acoustic concepts and design, learning how to create acoustic and lighting designs to different building types – Studio work	PO3, PO9	2

Syllabus:

CO1:

Electrical Services: Electrical systems – Basic of electricity– single/Three phase supply – protective devices in electrical installation – Earthing for safety – Types of earthing – ISI Specifications. Electrical installations in buildings – Types of wires, wiring systems and their choice – planning electrical wiring for building – Main and distribution boards –Principles of illumination.

CO2:

Illumination and Lighting Design: Visual tasks – Factors affecting visual tasks – Modern theory of light and colour – synthesis of light – Additive and subtractive synthesis of colour – Luminous flux – Candle – solid angle illumination – utilization factor – Depreciation factor –MSCP – MHCP –Laws of illumination. Classification of lighting –Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals, and house lighting. Elementary idea of special features required, and minimum level of illumination required for physically handicapped and elderly in building types.
Electrical Layout of Simple Buildings: Electrical layout of a simple residential, school, and commercial building.

CO3:

Ventilation: The wind, The effects of topography on wind patterns, Air currents around the building, Air movement through the buildings, air changes, quality of air, use of fans, thermally induced air currents, pressure losses: Buoyancy-driven (Stack effect, Venturi effect) – Use of courtyard. Lab: Types of anemometers and its use. Wind tunnel experiment for wind movement around the buildings, Simple experiments to measure outdoor and indoor wind velocity.

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CO4: Fundamentals of architectural acoustics Fundamentals: Sound waves, frequency, amplitude, decibels, logarithms, measurement versus perception, addition, and subtraction of decibels. NC curves. Material property: Absorption, reflection, scattering, diffusion, transmission, absorption co-efficient, NRC, sound transmission class (STC), impact insulation class (IIC). **Acoustics of Architectural Spaces:** Reverberation time, sound in enclosed space, basic room acoustics concepts and design, design of auditorium, conference hall, recording studio and classrooms. Environmental noise and its control.

Textbooks:

1. Barron. M. (2009). Auditorium acoustics and architectural design.2nd Ed. Taylor & Francis.
2. Concept nine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.
3. Cox, T. J. and D'Antonio, P. (2009). Acoustic Absorbers and Diffusers. 2nd Ed. Taylor & Francis
4. Cuttle, C. Lighting by Design. 2ndEd. Architectural Press.
5. Eagan, D. M. (2002). Architectural Lighting, 2ndEd. McGraw-Hill.
6. Eagan, D. M. (2002). Concepts in Architectural Acoustics.
7. Guzowski, M. (1999). Day lighting for Sustainable Design. McGraw Hill.
8. Harold, B. M. and Good friend, L. Acoustics for Architects. Reinhold.

References:

1. Heschong, L. (1976). Thermal Delight in Architecture. Cambridge: MIT Press.
2. Hopkins. C. (2008). Sound Insulation: Theory into Practice. 1stEd. Butterworth Heinemann.
3. Randall, W. (2008). Residential Lighting: A Practical Guide to Beautiful and Sustainable Design. 2ndEd. Wiley.
4. Rea, M. (2000). The Lighting Handbook. 9th Ed. Illuminating Engineering Society of North America.
5. Reinhart, C. (2014). Day lighting Handbook.
6. Smith, B. J., Peters, R. J. and Owen, S. (1982). Acoustics and Noise Control. New York: Longman.
7. Steffy, G. (2000). Time-Saver Standards for Architectural Lighting. McGraw-Hill.
8. Szokolay, S. V. (2008). Introduction to architectural science. Taylor & Francis.
9. Vigran, T. E. (2008). Building Acoustics. 1stEd. Taylor & Francis.

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23AR3221: Building Services - III (HVAC and fire safety)

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO 1	An understanding of Thermal Properties of the building material and components and mechanical ventilation	PO1,	2
CO 2	To understand the principles, systems, and design criteria of HVAC	PO1,	2
CO 3	To gain knowledge about fire safety norms in the buildings	PO1,	2
CO 4	To understand the mechanical transportation systems in buildings	PO3,	3

Syllabus:

CO1:

Thermal Properties of the building material and components and mechanical ventilation: Behavior of heat propagation, thermal insulating materials and their co-efficient of thermal conductivity. General methods of thermal insulation: Thermal insulation of roofs, exposed walls. Ventilation: Definition and necessity, system of ventilation. Principles of air conditioning Air cooling, Different systems of ducting and distribution, Essentials of air-conditioning system.

CO2:

HVAC: Principles, Systems and Design Criteria: Thermodynamics. Transfer of heat. Refrigeration cycle components. Vapor compression cycle. Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, cooling towers. Air conditioning systems for buildings of different scales and their requirements- window type, split system, package unit, direct expansion system, chilled water system, fan coil unit, district cooling systems. Energy efficient systems, environmental aspects, and latest innovations. Design criteria for selection of air conditioning. Configuring/ sizing of mechanical equipment, equipment, and spaces for them. Horizontal and vertical distribution of services for large buildings. Exercise on the above through choice, calculations, layout, drawings.

CO3

Fire and Safety: Causes of fire in buildings. Stages of fire and how it spreads. Fire drill. Heat/ fire/ smoke detection. Alarm and extinguisher systems. Fire safety standards. General guidelines for egress design for multi-storey buildings. Understanding all the above through product literature/ field visits. Exercise on design of fire safety systems for different building types through choice, calculations, layout, and drawings.

CO4:

Mechanical Transportation Systems in Buildings: Lifts and escalators - types and applications. Round trip time for lifts. Design of lift lobby and vertical transportation core. Conveyors, travelators, dumb waiters. Standards for all. Latest technologies in vertical transport systems. Integration of lifts and escalators with building automation systems. Understanding all the above through product literature/ field visits. Design exercise on the above through choice, calculations, layout, and drawings.

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Textbooks:

1. William H. Severns and Julian R Fellows, 'Air conditioning and Refrigeration', John Wiley and Sons,London, 1988.
2. National Building Code -Bureau of Indian Standards.
3. 'ISHRAE Handbook for Refrigeration', 2015.
4. George R. Strakosch (Editor), Robert S. Caporale, 'The Vertical Transportation Handbook' 4th Edition,Wiley, and Sons, 2010.
5. David Lee Smith, 'Environmental Issues for Architecture', Wiley, 2011. David Lee Smith, 'Environmental Issues for Architecture', Wiley, 2011.
6. National Building Code -Bureau of Indian Standards.

Reference Books:

1. A.F.C. Sherratt, 'Air Conditioning and Energy Conservation', the Architectural Press, London, 1980.
2. Andrew H Buchanan; 'Structural Design for Fire Safety', Wiley, 2001.
3. Swenson S. Don, 'Heating, Ventilating and Air Conditioning', American Technical Publishers, 1995.
4. ISHRAE, 'All about AHUs- Air Handling Units'.
5. CIBSE Guide D, 'Transportation Systems in Buildings',2010.
6. A. K. Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual',CBS, 2009.

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23AR4126: Building Services – IV (Building Automation)

L-T-P-S: 3-0-0-0 **Credits: 3** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO1	To understand the philosophy of building automation systems and subsystems	PO1,	2
CO2	To learn about communication and security systems	PO1,	2
CO3	To learn about the integration of building services into architectural design	PO1,	2
CO4	To learn about the Interaction and integration between building structure, systems, services, management, control, and information technology.	PO3,	3

Syllabus:

CO1:

Building Automation Systems & Controls: Philosophy. Introduction to System configuration, system modules, distributed systems, communication protocol and on-line measurements. Fire protection, security, and energy management. Control objectives. Sensors, controllers, and actuators. Understanding the concept of Microprocessor based controllers & digital controls. Examples of sub-systems such as - Digital Addressable Lighting Interface (DALI) and how it's useful to Architects.

CO2:

Communication and Security Systems: Voice communication systems, local area network, wireless LAN, Digital TV, CCTV, digital CCTV, teleconferencing, cellular phone system, and CABD. SMATV. Data networking. Short- and long-haul networks. Wideband network. Office automations. Public address/sound reinforcement systems. Digital public address system. Modern security systems.

CO3:

Integration of Services into Architectural Design: Introduction to Smart Building concept. Principles of grouping and integrating of horizontal and vertical distribution of all services in a multi-storied building/ large building. Services include vertical transportation, electrical, communication, air conditioning and fire safety.

CO4:

Interaction and integration between building structure, systems, services, management, control, and information technology. Different Application & Design software available. Integrating service requirements into architectural design in an appropriate typology involving a simple scale project through sketches/ drawings.

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23AR2157: Computer Studio - I (MS office, AutoCAD 3D)

L-T-P-S: 0-0-4-0 Credits: 2 Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To understand the basics of computer systems and their support technologies like MS Office.	PO1, PO2	2
CO 2	To create documentation reports, analysis reports, and audio visual presentations.	PO1, PO2	2
CO 3	To reciprocate the tools of 2D visualization to create architectural drawings.	PO1, PO2	2
CO 4	To create layouts, plot/print to scale drawings, design and edit 2Dgraphic images.	PO1, PO2	2

Syllabus:

CO1:

Technology of small computer systems, computer terminology operation principles of P.C, introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc. Understanding Bitmap images and Vector Graphics, Image size and Resolution. Basic Tools for Editing and Creating Graphics.

CO2:

Introduction to various software for documentation, presentation & drawing purposes. Simple operations such as creating, editing, formatting, saving, and printing documents. Familiarizing the use of scanners, printers, plotters etc.

Introduction to Applications of MS Office in presentation: Microsoft Word, Microsoft Power Point, Microsoft Excel, Adobe Page Maker.

Use of spreadsheets and for various architectural calculations-estimation, area calculations, project reports. Preparations of templates for regular repetitive functions.

CO3:

Introduction to AutoCAD as 2D drafting tool Digital drawings tools, drawing lines and shapes, modifying lines and shapes, drawing with accuracy and speed. Organizing plans, sections, and elevations, drawing and printing to scale, text styles and sizes, hatches, and dashed lines. Stencils and *blocks, advanced editing tools, and dimensioning drawings.*

CO4:

3D modelling using AutoCAD Introduction to 3D-modelling technique using AutoCAD. 3D basics: Axes, Planes and Faces. 3D Object Modification: Rotate, Mirror, Array and Scale. 3D Boolean

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operations: Union, Subtract, Intersect. 3D primitive objects: Box, Wedge, Cone, Sphere, Cylinder, Torus and Pyramids. Solid modeling: Revolve, Shell, Taper, Loft, Path extrusion and sweep.

Reference books:

1. Ralph Grabowski, "The Illustrated AutoCAD 2002 Quick Reference", 1st edition, Cengage Learing, 2001.
2. Shamtikoo,"AutoCAD 2000: A Problem-Solving Approach", DelmarCengage,1999.
3. Fiorello. J. A., "CAD for Interiors beyond the basics", Wiley publications, 2011.

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23AR2262: Computer Studio – II

(Image making and 3d making software)

L-T-P-S: 0-0-4-0 Credits: 2 Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To learn the use of image editing software	PO1, PO2	2
CO 2	To create images and animation using graphics and animation software	PO1, PO2	2
CO 3	To understand, visualize the space and apply the tools of sketch up or equivalent software	PO1, PO2	2
CO 4	To create a detailed 3D model by working in collaboration by applicationof advanced tools	PO1, PO2	2

Syllabus:

CO1: Introduction of various software available for Architectural presentations such as Photoshop & Coral.

CO2: Image doctoring and manipulation using computer software for graphics and animation (Photoshop and Flash).

CO3: Building Modelling and basic rendering techniques, using 3DSMax or Sketchup or equivalent.

CO4: Advanced Building Modelling and basic rendering techniques, using 3DSMax or Sketchup or equivalent.

Textbooks:

1. Deke McClelland, "Photoshop 7 Bible Professional Edition", Wiley John & Son INC, New York, 2000.
2. Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon process, 2012.
3. Adobe Creative Team – Adobe Photoshop CS (Class Workbook).

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22AR3165: Computer Studio - III
(Building Information Modelling)

L-T-P-S: 0-0-4-0 **Credits: 2** **Prerequisite: Nil**

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To understand interface, workspace, and utilization of tools of 3D modeling software applies to the required tools and components in building a 3D model.	PO1, PO2	2
CO 2	To create documentation reports, analysis reports, and audio visual presentations.	PO1, PO2	2
CO 3	To understand, visualize the space and apply the tools of BIM software,identify the need of tools of BIM software.	PO1, PO2	2
CO 4	To create a detailed 3D model by working in collaboration by applicationof advanced tools	PO1, PO2	2

Syllabus:

CO1: Explain the uses of BIM (building information Modeling), touching upon the Concepts used in 2DDrawing and extending to 3D Modeling, Basic awareness on Interface, Setting up workspace. 3D modeling using Walls – Windows – Doors– floors – Slabs – Staircase – Railing – Furniture.

CO2: Basic editing of components. Using Cross Sections Tool. Exporting 3D Model to Architectural 2D- Drawings (Plans – Elevations – Sections – Details.).

CO3: Introduction – Applying materials – Creating and Editing materials – Setting up Camera – Rendering settings – Enhancing final output using Image editing software. Curtain Walls – Columns – beams – Massing – working in collaboration. Adding Architectural Elements – Creating components – Rendering in Cloud.

CO4: Integration of all services and structural components using Building information modelling.

Textbooks:

1. Ryan Duell, Tobias Hathorn, Tessa Reist Hathorn, "Autodesk Revit Architecture 2016 Essentials: Autodesk Official Press", Sybex, First Edition, 2016.
2. Eric Wing, "Autodesk Revit 2017 for Architecture No Experience Required", Sybex, First Edition, 2016.
3. Eric Wing, "Autodesk Revit 2017 for Architecture No Experience Required", Sybex, First Edition, 2016

Reference books:

1. Marcus Kim, Lance Kirby, Eddy Krygiel, "Mastering Autodesk Revit 2017 for Architecture", Wiley India, 2016.
2. Prof Sham Tickoo Purdue Univ, "Exploring Autodesk Revit 2017 for Architecture", CADCIM, Technologies, 13th Edition, 2016

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Annexure 1 (C):

The Program Structure of 2023-24 admitting batch is shown below

1. Program structure (with all Courses) 2023-24

SNO	SEM	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Pre requisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
1	1	22AR1101	Theory of Architecture	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
2	1	22AR1102	History of Architecture - I (Ancient Civilization)	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
3	1	22AR1103	Building Materials - I (Brick, Stone, Wood)	BSAE	2	0	0	0	2	2	Nil	Retained course	B.V. Lakhsmi	Employability	Feedback from faculty
4	1	23AR1151	Art and Visual Graphic Studio	PC	0	0	6	0	6	6	Nil	Retained course	-	Skill development	-
5	1	23AR1152	Architectural Drawing - I (Basic Geometry)	PC	0	0	6	0	6	6	Nil	Retained course	-	Skill development	-
6	1	22AR1153	Architectural Design Studio	PRI (PC)	0	0	9	0	9	9	Nil	Retained course	-	Entrepreneurship	-

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			– 1 (Basic Design)											
7	1	23UC1101	Integrated Professional English	HAS	0	0	2	0	2	2	Nil	Retained course	-	Skill development	-
8	1	22UC0009	Ecology & Environment	BSAE	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
9	2	23AR1204	Design of Structures - I (Plane trusses, shear force and bending moments)	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
10	2	22AR1205	History of Architecture - II (Hindu Architecture)	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
11	2	23AR1206	Building Materials - II (cement, R.C.C, and Glass)	BSAE	2	0	0	0	2	2	Nil	Revised course	B.V. Lakhsmi	Employability	Feedback from faculty
12	2	23AR1254	Model Making Workshop	PC	0	0	4	0	4	4	Nil	Retained course	-	Skill development	-
13	2	23AR1255	Architectural Drawing - II (3D forms and colour)	PC	0	0	4	0	4	4	Nil	Retained course	-	Skill development	-
14	2	23AR1256	Architectural Design Studio -II	PRI (PC)	0	0	9	0	9	9	23AR1153	Retained course	-	Entrepreneurship	-
15	2	23UC1202	English Proficiency	HAS	0	0	2	0	2	2	Nil	Retained course	-	Skill development	-

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16	2	22UC0011	Gender and Social Equality	OEC	2	0	0	0	0	2	Nil	**New Course**	Dean academics	Employability	Gender Equality and topics are added in Human Values course for better learning of Students.
17	3	23AR2107	Design of Structures - II (Design of beams and columns)	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
18	3	22AR2108	History of Architecture - III (Medieval periods)	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
19	3	22AR2109	Climate Responsive Architecture	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
20	3	23AR2110	Site Survey and Analysis	SEC	0	0	0	4	4	4	Nil	Retained course	-	Skill development	-
`	3	23AR2157	Computer Studio - I (MS office, AutoCAD 3D)	SEC	0	0	0	3	3	3	Nil	Revised course	G. Vidya Sagar	Skill development	Feedback from students and industry experts
22	3	23AR2158	Building Construction - I (Masonry)	BSAE	0	0	4	0	4	4	Nil	Revised course	B.V. Lakhsmi	Employability	Feedback from faculty

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23	3	23AR2159	Architectural Design Studio -III	PRI (PC)	0	0	9	0	9	9	23AR1256	Retained course	-	Entrepreneurship	-
24	3	23UC2103	Design Thinking and Innovation	HAS	0	0	4	0	4	2	Nil	Retained course	-	Entrepreneurship	-
25	4	23AR2211	Design of Structures - III (Design of footings)	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
26	4	22AR2212	Building Services - I (Plumbing and sanitation)	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
27	4	23AR2260	Building Construction - II (Joinery, trusses and staircase)	BSAE	0	0	4	0	4	4	Nil	Revised course	B.V. Lakhsmi	Employability	Feedback from faculty
28	4	22AR2213	Site Analysis and Planning	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
29	4	23AR2261	Architectural Design Studio -IV	PRI (PC)	0	0	9	0	9	9	23AR2159	Retained course	-	Entrepreneurship	-
30	4	22AR2211	Contemporary Indian Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
31	4	23AR2262	Computer Studio - II (Image making and 3d making software)	SEC	0	0	0	3	3	3	Nil	Revised course	G. Vidya Sagar	Skill development	Feedback from students and industry experts
32	4	23AR2223	Human Settlements and Planning	PCC	2	0	0	0	2	2	Nil	Retained course	Kiran Kumar	Employability	Feedback from faculty

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33	5	23AR3115	Design of Structures - IV (Detailing of structural member)	BSAE	3	0	0	0	3	3	Nil	Revised course	-	Employability	-
34	5	23AR3116	Building Services - II (Electrical and Acoustics)	BSAE	3	0	0	0	3	3	Nil	Revised course	G. Vidya Sagar	Employability	Feedback from faculty
35	5	23AR3143	Building Construction - III (Steel structures, Partitions and false ceiling)	BSAE	0	0	4	0	4	4	Nil	Retained course	-	Employability	-
36	5	23AR3117	Building Bye laws and Office Management	PC	2	0	0	0	2	2	Nil	**New Course**	A. Priya	Entrepreneurship	Feedback from faculty
37	5	23AR3164	Architectural Design Studio -V	PRI (PC)	0	0	9	0	9	9	23AR2261	Retained course	-	Entrepreneurship	-
38	5	22AR3118A	PE-1 (Interior Design studio)	PE	0	0	4	0	4	4	Nil	Retained course	-	Entrepreneurship	-
		22AR3118B	PE-1 (Furniture Design studio)									Retained course		Entrepreneurship	
39	5	22AR3116	Contemporary Western Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
40	5	23AR3165	Computer Studio - III (Building Information Modelling)	SEC	0	0	0	4	4	4	Nil	**New Course**	G. Vidya Sagar	Skill development	Feedback from students and industry experts

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41	5	23AR3120A	PE-2 (Vernacular Architecture)	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
		23AR3120B	PE-2 (Sustainable Architecture)									Retained course		Employability	
42	6	23AR3221	Building Services - III (HVAC and fire safety)	BSAE	3	0	0	0	3	3	Nil	Revised course	G. Vidya Sagar	Employability	Feedback from faculty
43	6	23AR3266	Building Construction - IV (R.C.C and special concrete)	BSAE	0	0	4	0	4	4	Nil	Retained course	-	Employability	-
44	6	22AR3222	Specification, Estimation and Costing	PC	3	0	0	0	3	3	Nil	Retained course	-	Skill development	-
45	6	23AR3224A	PE-3 (Landscape Design studio)	PE	0	0	4	0	4	4	Nil	Retained course	-	Entrepreneurship	-
		23AR3224B	PE-3 (Modular Construction Studio)									Retained course		Entrepreneurship	
46	6	23AR3267	Architectural Design Studio -VI	PRI (PC)	0	0	12	0	12	12	23AR3144	Retained course	-	Entrepreneurship	-
47	6	23AR3225A	PE-4 (Appropriate Construction Technologies)	PE	2	0	0	0	2	2	Nil	Revised course	BOS	Employability	Feedback from faculty
		23AR3225B	PE-4 (Energy Efficient Building)									Retained course		Employability	

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48	6	22BB21C3	Human Resource Management	OE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
49	7	23AR4126	Building Services - IV (Building automation)	BSAE	3	0	0	0	3	3	Nil	Retained course	G. Vidya Sagar	Employability	Feedback from faculty
50	7	23AR4127A	PE-5 (Advanced Building Techniques)	PE	0	0	4	0	4	4	Nil	Revised course	BOS	Employability	BOS external expert's suggestion
		23AR4127B	PE-5 (Architecture Photography)									Retained course		Employability	
51	7	23AR4128A	PE-6 (Housing)	PE	2	0	0	0	2	2	Nil	Retained course	B. Kiran Kumar	Employability	Feedback from faculty
		23AR4128B	PE-6 (Intelligent Building)									Retained course		Employability	
52	7	23AR4168	Architectural Design Studio -VII	PRI (PC)	0	0	12	0	12	12	23AR3267	Retained course	-	Entrepreneurship	-
53	7	23AR4129A	PE-7 (Architecture Conservation)	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
		23AR4129B	PE-7 (Set Design)									Revised course	Shivendu	Employability	Feedback from faculty
54	7	23AR4130	Working Drawing - I (Building structure, civil and masonry)	BSAE	0	0	4	0	4	4	Nil	Retained course	-	Skill development	-

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55	7	23AR4131	Research Methodology	PRI (PC)	2	0	0	0	2	2	Nil	**New Course**	Tanushree	Employability	BOS external expert's suggestion
56	7		Universal Human Values & Professional Ethics	HAS	2	0	0	0	2	2		**New Course**	Dean academics	Employability	
57	8	22AR4232	Building Construction and Management	PAECC	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
58	8	23AR4269A	PE-8 (Dissertation)	PE	0	0	4	0	4	4	Nil	Retained course	-	Skill development	-
		23AR4269B	PE-8 (Thesis Seminar)									Retained course		Skill development	
59	8	23AR4233A	PE-9 (Urban Design)	PE	2	0	0	0	2	2	Nil	Retained course	B. Kiran Kumar	Employability	Feedback from faculty
		23AR4233B	PE-9 (Transportation Planning)									Retained course		Employability	
60	8	23AR4270	Urban Design Studio	PRI (PC)	0	0	12	0	12	12	23AR4168	Retained course	-	Entrepreneurship	-
61	8	23AR4234A	PE-10 (Behavioural Architecture)	PE	3	0	0	0	3	3	Nil	Revised course	P. Senthil	Employability	Feedback from faculty
		23AR4234B	PE-10 (Disaster Mitigation and Management)									Revised course		Employability	

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62	8	23AR4271	Working Drawing - II (Detailing)	BSAE	0	0	4	0	4	4	Nil	Retained course	-	Skill development	-
63	9	23AR5172	Practical Training / Internship	PAECC	0	0	30	0	30	30	23AR4270	Retained course	-	Employability	-
64	10	22AR5235	Architecture Professional Practice	PAECC	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
65	10	23AR5273	Architectural Thesis	PRI (PC)	0	0	15	0	15	15	23AR5172	Retained course	-	Entrepreneurship	-
										300					

Percentage of Syllabus Revision = 27%

Percentage of Courses focusing on Employability = 56 %

Percentage of Courses focusing on Entrepreneurship = 24 %

Percentage of Courses focusing on Skill Development = 20%

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