JBR ARCHITECTURE COLLEGE
HYDERABAD

PROGRAM OUTCOMES (POs)

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

JBR ARCHITECTURE COLLEGE
HYDERABAD

DEPARTMENT OF B. ARCH.
REGULATION22

Course Code	Course Title	COURSE OUT COMES
AR22B1.1C	BASIC DESIGN	**After the completion of this course, the student will be able to** **CO1:** Solve simple design problems creatively with clear expression within the frame work of elements and principles of design. **CO2:** Solve 2D and 3D design problems with a systematic approach in different mediums, colour and textures. **CO3:** Design building elements in different architectural contents for various building typologies. **CO4:** Demonstrate the ability to work in group to put-up effective teamwork with interdisciplinary approach. **CO5**: Demonstrate the ability to express and communicate abstract ideas both graphically and orally.
AR22B1.2C	MATERIALS AND BUILDING CONSTRUCTION – I	**After the completion of this course, students will be able to:** **CO1:** Comprehensively learn knowledge on basic building materials with the current innovations and trends. **CO2:** Carry out a systematic study of building materials in the scope of ingredients, properties, manufacturing process, uses, installation and market price with real life applications. **CO3**: Understanding and graphic representation of basic components of buildings in formal methods. **CO4**: Learning systematic methods of construction of buildings. **CO5**: Learning to represent building construction in the form of drawings, instructions and check the quality of the work.

AR22B1.3C	ARCHITECTURAL DRAWING - I	**After the completion of this course, the student will be able to:** **CO1:** Measure the parts of the buildings, prepare and present different architectural drawings. **CO2:** Demonstrate the ability to systematically construct basic geometrical shapes accurately. **CO3:** Demonstrate the ability to measure buildings parts and graphically represent to scale. **CO4**:Demonstrate the ability to make neat, accurate and impressive method of graphic representation of buildings.
AR22B1.4C	INTRODUCTION TO ART AND ARCHITECTURE	**After the completion of this course, the student will be able to:** **C01:** Understand art, its theories and philosophies. **CO2:** Understand relevance of art in architecture and their inter-relationship. **CO3:** Become familiar with the basics of architecture.
AR22B1.5C	THINKING FOR ARCHITECTS	**At the end of this course, the student will be able to:** **CO1:** Become familiar with the importance of thinking in the field of Architecture. **CO2:** Critically analyze the issues related to complex problems and real-world problems. **CO3:** Solve real-world problems in a creative process using conceptual and graphics thinking.

GN22B2.1A	COMMUNICATION SKILLS	**At the end of this course, the student will be able to:** **CO1:** Demonstrate LSRW skills and familiarizing with effective language. **CO2:** Interpret, analyze and organize information suitable for formal communication. **CO3:** Write in different genres.
SP22B1.1A	BASIC DIGITAL TOOLS	**Upon successful completion of this course student will be able to:** **CO1**: Work with a word processing program and a desktop publishing software application which helps them to create on their own with quality, such as essays, resume, flyers, brochures, magazines, thesis reports. **CO2:** Work with both raster and vector software which covers the gamut of image editing to creating banners, billboards, posters, digital artwork and designs, icons, logos, website graphics which can be widely used in advertising, branding or promotional content. **CO3**: Make effective presentations and slideshows and present complex concepts and ideas with clearly Understandable graphs and pictograms. **CO4**: Develop general 2D layout drawing and 3D modeling skills which can be used across various other platforms in any style they want. **CO5**: Write simple computer programming and create simple shape animations.

AR22B2.1C	ARCHITECTURAL DESIGN – I	**After Completion of the Course, the Students will be able to** **CO1:** The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization. **CO2:** Understanding of Anthropometrics and space standards. **CO3:** Ability to understand the aesthetic and psychological experience. **CO4 :** Ability to understand image and symbolism. **CO5 :** The students shall be learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project.
AR22B2.2C	MATERIALS AND BUILDING CONSTRUCTION –II	**After completion of the course, a student will be able to:** **CO1:** Know about building elements and their construction principles. **CO2:** Understand the composition of various compatible building materials for construction. **CO3:** Understand the design abilities by applying basic principles of construction and choosing appropriate materials and techniques as per current market trends.

AR22B2.3C	ARCHITECTURAL DRAWING AND GRAPHICS – II	**After completion of the course, a student will be able to:** **CO1:** Understanding the proficiency in drawing, which is seen as a primary communication tool in the practice of architecture just like language? **CO2:** Understanding the perspective of the buildings. **CO3:** Demonstrate an understanding of furniture, people and accessories in one and two point projected perspective drawing. **CO4:** Articulate an understanding of volumetric drawings used in interior design.
AR22B2.4C	STRUCTURAL MECHANICS	**After completion of the course, a student will be able to:** **CO1:** Analyze systems to determine their stability, determinacy, and indeterminacy. **CO2:** Analyze beams, frames, and trusses for both specific static load cases and moving load cases; become proficient in determining the maximum shear and moment in beams and frames (shear and moment diagrams). **CO3:** Calculate deflections and/or rotations of beams, frames and trusses. **CO4:** Solve for reactions and draw shear and moment diagrams for statically indeterminate structures solved by a variety of methods. **CO5:** Calculate deflections and/or rotations of indeterminate beams, frames and trusses.
AR22B2.6A	MODEL MAKING WORKSHOP	**After completion of the course, a student will be able to:** **CO1:** Preparation of scaled models and presentation models. **CO2:** Photography in built models.

GN22B2.2A	ENVIRONMENTAL STUDIES	**After Completion of the Course, the Students will be able to :** **CO1**: Over exploitation of different resources. **CO2:** Identification of alternate resources. **CO3:** The concept of ecosystem and its structure. **CO4:** Create awareness about pollution prevention through individual participation. **CO5:** Values of biodiversity and adapting sustainable lifestyle. **CO6:** Various environmental legislations.
AR22B3.1C	ARCHITECTURAL DESIGN – II	**Upon successful completion of the course the students will be able to:** **CO1:** Develop an effective design process model that familiarizes the students to the iterative nature of design. **CO2:** Formulate methods of Case-study as an important phase in the design cycle and equip the students with necessary tools, procedural knowledge and skills **CO3:** Investigate the Problem-Seeking methodology as a primer to gain in depth understanding of the design problem before an effective solution could be conceived. **CO4:** Create articulated design by adopting meaningful design rationale and engage in conceptual thinking to generate creative design concepts. **CO5:** Generate design solutions for diverse contextual settings such as user, site, built space, etc.

AR22B3.2C	MATERIALS AND BUILDING CONSTRUCTION III	**Upon successful completion of the course the students will be able to:** **CO1:** Demonstrate knowledge on glass, types of glass, natural and artificial flooring materials and R.C.C components. **CO2 :** Implement the knowledge of R.C.C construction in architectural design and appraise building materials in the scope of ingredients, properties, manufacturing process, uses, installation and market price with real life applications. **CO3:** Learn systematic methods of construction of buildings using R.C.C. **CO4:** Prepare construction drawings as studio exercises along with the theoretical inputs on R.C.C. **CO5:** Conduct site visits, case studies market surveys for flooring materials, Glass types, and documentation of R.C.C building components .
AR22B3.4C	HISTORY OF ARCHITECTURE – I	**After the completion of this course, students will be able to** **CO1:** Identify the common characteristics of a particular architectural style **CO2:** Describe the development of built form in response to socio religious, aesthetic, and environmental factors of architecture from prehistoric to modern times. **CO3:** Illustrate various building types, construction methods, architectural characteristics of prehistoric, classical, medieval and pre modern periods. **CO4:** Recognize the architectural elements used in different time periods.

AR22B3.3C	PERSPECTIVE AND RENDERING	**Upon successful completion of the course the students will be able to:** **CO1:** Perceive the Objects in Three Dimensional Environment and able to create 2 D drawings of the same. **CO2:** Develop a perspective drawing understanding the scale and visual geometry of the buildings representing ideas of Design. **CO3:** Render a perspective understanding different light conditions and environment that enhances the value of drawings close to reality. **CO4:** Construct shadows on Building Facades as well as objects associated in the Landscape like Trees, Human Figures considering the day light at different times. **CO5:** Compose architectural design work in the form of Portfolio using Illustration and Digital techniques for a professional presentation.
AR22B3.5C	STRUCTURAL ANALYSIS - I	**Upon the successful completion of the course, the student will be able to** **CO1:** Assess the shear force and bending moments in determinate beams. **CO2:** Analyze shear and bending stress behavior for beams **CO3:** Evaluate shear force and bending moment to fixed beams and propped cantilevers. **CO4:** Compute the magnitude of deflections for simply supported and cantilever beams for point load and UDL. **CO5:** Analyze 3 hinged arches to perform bending moment calculations. Understand structural behavior of domes, vaults, chimneys and retaining walls.

N22B3.1A	UNIVERSAL HUMAN VALUES	**Upon successful completion of the course, students will be able to:** **CO1:** Exploreholistic vision oflife - themselves and their surroundings. **CO2:** Develop competence and capabilities for maintaining Health andHygiene. **CO3:** Analysevarious problems in life, family,Societyand in handling problems with Sustainable Solutions. **CO4:** Apply values to their own self in different day-to-day settings in real life and in handling problems with sustainable solutions. **CO5:** Adopt the value of appreciation and aspiration for excellence and gratitude for all.
AR22B3.6C	CLIMATOLOGY FOR BUILT ENVIRONMENT	**After successfully completing the course the student will able to:** **CO1:** Apply knowledge of macro level climatic data to the site level **CO2:** Understand and analyse thermal comfort factors effecting the human body. **CO3:** Evaluate potential of site for comfortable micro climatic conditions **CO4:** Develop climate sensitive design strategies **CO5:** Create small scale structures which can achieve comfortable indoor thermal conditions through passive design.

AR22B4.1C	ARCHITECTURAL DESIGN – III	**Upon successful completion of the course the students will be able to:** **CO1:** Formulate various conditioning f actors that play important role in architecture design such Scio-economic aspects, cultural and historic aspects, climate responsive solutions, etc. **CO2:** Develop an understanding of the function of a typical building in terms of an integrated system of components such as structure, plumbing, electrical, sanitary provisions. **CO3:** Investigate various statutory norms, NBC local bye laws and other codes relevant to buildings and adopt salient guidelines for specific building topologies. **CO4:** Generate a methodology for structural basis in architectural design for while discussing the different structural components and their roles in the building. **CO5:** Categorize various building materials employed in modern-day buildings and develop appropriate selection criteria for using them.

AR22B4.2C	MATERIALS AND BUILDING CONSTRUCTION -IV	**Upon successful completion of the course the students will be able to:** **CO1:** Demonstrate knowledge on Building Materials like Metals, Paints and Varnishes and its applications in building construction **CO2:** Implement the knowledge of the principles, theories, and applications of Steel in building construction. **CO3:** Develop the ability to select appropriate steel sections for different elements, steel work construction methods and techniques based on the specific needs and requirements of a building project. **CO4:** Prepare construction drawings as studio exercises along with the theoretical inputs on steel. **CO5:** Conduct market surveys for Metals, Paints and Varnishes and documentation of steel structures.
AR22B4.4C	HISTORY OF ARCHITECTURE – II	**After the completion of this course, students will be able to** **CO1:** Illustrate the development of Buddhist architecture in India and Asia. **CO2:** Understand the development of Hindu temple Architecture in different parts of India. **CO3:** Review the development of Jain Architecture in Indian Sub-Continent. **CO4:** Identify the characteristic features of Islamic architecture in different provinces of India. **CO5:** Describe the construction techniques used in building Temples and Mosques etc in India.

AR22B4.3C	LANDSCAPE ARCHITECTURE	**With the successful completion of the course students will have capability to:** **CO1:** Understand the history and development of landscape architecture and its role in built environment. **CO2:** Conduct survey, prepare site inventory, analyze site, and draw inferences/identify challenges for design and development **CO3:** Assimilate and apply site planning principles to develop site for various land uses. **CO4:** Identify plants and design with plants for functional, environmental, and visual effects. **CO5:** Skill to design and detail various landscape elements and specify appropriate materials and construction techniques to be used. **CO6:** Research, document, discuss and narrate designed landscapes /works of landscape architects **CO7:** Ability to design and plan landscape for small scale projects.
AR22B4.5C	STRUCTURAL DESIGN(RCC)	**Upon the successful completion of the course, the student will be able to** **CO1:** Understand IS code provisions to evaluate design concepts of RCC. **CO2:** Perform the design calculations for flexure members, beams and slabs. **CO3:** Evaluate the behavior and design capacity of compression members. **CO4:** Assess the strength and design of Cantilever beams and slabs, lintels, sunshades and staircases. **CO5:** Discuss the conceptual understanding of pre stressing methods.

AR22B4.6C	WATER, SANITATION AND HYGIENE	**On successful completion of the course, student should have capability to** **CO1:** Identify the importance of water supply, sanitation and hygiene in architecture and design. **CO2:** Evaluate different water supply and plumbing technologies, systems and interventions for buildings and communities **CO3:** Apply site planning and design principles for building water supply, sanitation and plumbing facilities and infrastructure in relation to water resources, sanitation, and hygiene requirements **CO4:** Design integrated solutions that promote health, safety, wellbeing at building and site level. **CO5:** Apply critical thinking, problem-solving, and project management skills to develop water supply, sanitation, and hygiene projects that align with local and global standards, regulations, and best practices
AR22B4.7C	COMPUTER AIDED DESIGN - I	**After successfully completing the course the student will able to:** **CO1:** Apply CAD as a tool to create better presentations **CO2:** Analyze Satellite imagery to extract site related information into the CAD interface **CO3:** Understand interoperability of various digital formats **CO4:** Create required project drawings on CAD **CO5:** Create technical drawings and plans for architectural and engineering projects.

DEPARTMENT OF B.ARCH.

REGULATION17

Course Code	Course Title	COURSE OUT COMES
AR17B1.1C	BASIC DESIGN	**After the completion of this course, the student will be able to** **CO1:** Solve simple design problems creatively with clear expression within the frame work of elements and principles of design. **CO2:** Solve 2D and 3D design problems with a systematic approach in different mediums, colour and textures. **CO3:** Design building elements in different architectural contents for various building typologies. **CO4:** Demonstrate the ability to work in group to put-up effective teamwork with interdisciplinary approach. **CO5:** Demonstrate the ability to express and communicate abstract ideas both graphically and orally.
AR17B1.2C	ARCHITECTURAL DRAWING AND GRAPHICS – I	**After the completion of this course, the student will be able to** **CO1:** Knowledge and practice of fundamentals in architectural drawing. **CO2:** Enhanced skills in architectural representation scaled geometrical drawings and 3-D views. **CO3:** Handling equipment, learning drafting skills and basic architectural representation. **CO4:** Learning Measured drawing and representation.
AR17B1.3C	BUILDING CONSTRUCTION- I	**By the end of the course, student should have learnt:** **CO1**: Brick, stone and composite masonry construction and application. **CO2**: To interpret simple partition walls and foundations.

AR17B1.4C	BUILDING MATERIALS – I	**By the end of the course, student should have learnt:** To develop the conceptual knowledge in building material and helps to understand the materials of construction such as bricks, stone, cement, concrete with its application in the building industry.
AR17B1.5C	STRUCTURAL MECHANICS – I	**After the completion of this course, the student will be able to** **CO1:** The student will be in a position to calculate the forces acting on a rigid body in equilibrium and the nature of the force in the members of a truss. **CO2:** To determine the elastic properties of a material and the nature of internal force (stresses) acting in the body and able to calculate the cross-sectional properties of standard and built up shapes.
AR17B1.6C	INTRODUCTION TO ART AND ARCHITECTURE	**After the completion of this course, the student will be able to** **CO1:** The student will gain an understanding developing the art sensitivity in design. **CO2:** The student will learn about various national and international artists. **CO3:** The student will gain technical knowledge of the types of drawings and the factors influencing the design of the buildings. **CO4**: The student will gain an understanding of how people respond to the climate and various other factors influencing the outcome of various vernacular styles from different regions of the world

AR17B1.7C	WORKSHOP- CARPENTRY & MODEL MAKING	**After the completion of this course, the student will be able to** **CO1:** Understand of different types of materials and its feasibility in model making. **CO2:** An hence the awareness of Photography, carpentry work. **CO3:** Understand the knowledge of joinery system of steel-steel, wood-wood and wood-steel through of welding and wooden joints.
GN17B1.2A	ENVIRONMENTAL STUDIES	**After the completion of this course, the student will be able to** **CO1:** Over exploitation of different resources. **CO2:** Identification of alternate resources. **CO3:** The concept of ecosystem and its structure. **CO4:** Create awareness about pollution prevention through individual participation. **CO5:** Values of biodiversity and adapting sustainable lifestyle. **CO6:** Various environmental legislations.
AR17B2.1C	ARCHITECTURAL DESIGN – I	**After Completion of the Course, the Students will be able to** **CO1 :** The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization. **CO2 :** Understanding of Anthropometrics and space standards. **CO3 :** Ability to understand the aesthetic and psychological experience. **CO4 :** Ability to understand image and symbolism. **CO5 :** The students shall be learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project.

AR17B2.2C	ARCHITECTURAL DRAWING AND GRAPHICS – II	**After Completion of the Course, the Students will be able to** **CO1**: Enhanced skills to represent architectural elements, their shades and shadows in 2-D and 3-D. **CO2**: Improved skills working with various rendering media and their application.
AR17B2.6C	HISTORY OF ARCHITECTURE - I	**After successful completion of course a student will be able:** **CO1**: To understand and remember the architectural development with reference to time, space and people. **CO2**: To analyse and evaluate different architectural styles development with reference to time, space and people.
AR17B2.3C	BUILDING CONSTRUCTION – II	**After Completion of the Course, the Students will be able to** **CO1:** Knowledge of properties and construction methods of brick, clay products and timber products. **CO2 :** Ability to design and detail structural and nonstructural components of simple buildings using the above materials. **CO3 :** Understand the Timber materials and its characteristics and usage in market. **CO4 :**Understand the Various techniques of using Timber in Building Construction. **CO5 :**Ability to integrate knowledge of properties and construction methods of basic building materials in the design of simple projects.

AR17B2.4C	BUILDING MATERIALS – II	**At the end of course Student should have learnt:** **CO1:** To Understand relation between material properties and their structural form. **CO2:** Ability to identify crucial problem areas in manufacture **CO3:** To identify various building materials and select a suitable type of building material for given situation. **CO4:** To be aware of various traditional building materials and also the emerging materials in the field Construction **CO5:** Understanding of the importance of experimental verification of material properties.
AR17B2.5C	STRUCTURAL MECHANICS –II	**After successful completion of course a student will be able:** **CO1:** Analyze various types of statically indeterminate beams. **CO2:** Compute slope and deflection in statically determinate beams. **CO3:** Evaluate the structures under direct and eccentric axial loading.
AR17B2.7C	SURVEYING AND LEVELING	**After successful completion of course a student will be able:** **CO1:** To relate the practical, fieldwork, and make it appropriate for the profession of Architecture and execution of building projects. **CO2:** To understand and remember locating the object positions in horizontal andvertical plane with desired accuracy as needed for architectural profession. **CO3:** To apply and analyze modern gadgets available for precise work in the field and use of computer software in this subject. **CO4:** To create and interpret survey drawings.

GN17B2.1A	COMMUNICATION SKILLS	**After Completion of the Course, the Students will be able to** **CO1:** Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies. **CO2 :** Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation. **CO3:** Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings. **CO4 :** Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing. **CO5 :** Applying the above Knowledge in a Practical design.
AR17B3.2C	ARCHITECTURAL DRAWING &GRAPHICS – III	**After successful completion of course a student will be able:** **CO1:** Understand, remember, apply and analyse the perspective projections, use of shades and shadows, and various architectural presentation and rendering techniques. **CO2:** To create/ communicate an architectural idea / proposal in a legible and effective manner. **CO3:** To create simple architectural drawing using CAD.

AR17B3.1C	ARCHITECTURAL DESIGN – II	**Upon successful completion of the course the students will be able to:** **CO1:** Develop an effective design process model that familiarizes the students to the iterative nature of design. **CO2:** Formulate methods of Case-study as an important phase in the design cycle and equip the students with necessary tools, procedural knowledge and skills **CO3:** Investigate the Problem-Seeking methodology as a primer to gain in depth understanding of the design problem before an effective solution could be conceived. **CO4:** Create articulated design by adopting meaningful design rationale and engage in conceptual thinking to generate creative design concepts. **CO5:** Generate design solutions for diverse contextual settings such as user, site, built space, etc.
AR17B3.3C	BUILDING CONSTRUCTION-III	**After Completion of the Course, the Students will be able to** **CO1:** Knowledge of properties of ferrous and non ferrous metals as materials for buildings **.** **CO2:** An understanding of possibilities of steel as an important building construction material **.** **CO3:** Ability to design and detail structural and non structural components of simple buildings using metals**.** **CO4:** Ability to use metal innovatively in building projects**.** **CO5 :** Ability to Design and construction details in the form of sketches, drawings, models

AR17B3.5C	HISTORY OF ARCHITECTURE – II	**After the completion of this course, students will be able to** **CO1:** Illustrate the development of Buddhist architecture in India and Asia. **CO2:** Understand the development of Hindu temple Architecture in different parts of India. **CO3:** Review the development of Jain Architecture in Indian SubContinent. **CO4:** Identify the characteristic features of Islamic architecture in different provinces of India. **CO5:** Describe the construction techniques used in building Temples and Mosques etc in India.
AR17B3.6C	BUILDING SERVICES – I	**After Completion of the Course, the Students will be able to** **CO1:** Understanding of water supply, sewage, drainage and waste systems in buildings . **CO2:** Ability to conceptually plan/ design the above for a given simple context . **CO3:** Understanding of strom water drainage and its applications . **CO4:** Understanding of solid waste management and its applications . **CO5:** Design in the form of choice, details of system and layout/ drawings.
AR17B3.7C	CLIMATOLOGY	**After successful completion of course a student will be able:** **CO1:** Identify the climatic elements which affect the built environment. **CO2:** Associate those elements as guiding factors for building design. **CO3:** Execute different climate-responsive passive design strategies. **CO4:** Correlate climate factors & their effects on design options. **CO5:** Grade the design options based on best suitability as per the climatic conditions.

GN17B2.2A	VALUE EDUCATION	**At the end of the course students are able to** **CO1:** Knowledge of self-development . **CO2:** Learn the importance of Human values . **CO3:** Developing the overall personality. **CO 4:** Develop self-resilience **CO5:** Assess the impact of Ethics and Values on global development.
AR17B4.1C	ARCHITECTURAL DESIGN- III	**Upon successful completion of the course the students will be able to:** **CO1:** Formulate various conditioning f actors that play important role in architecture design such Scio-economic aspects, cultural and historic aspects, climate responsive solutions, etc. **CO2:** Develop an understanding of the function of a typical building in terms of an integrated system of components . **CO3:** Investigate various statutory norms, NBC local bye laws and other codes relevant to buildings and adopt salient guidelines for specific building topologies. **CO4:** Generate a methodology for structural basis in architectural design for while discussing the different structural components and their roles in the building. **CO5:** Categorize various building materials employed in modern-day buildings and develop appropriate selection criteria for using them.

AR17B4.6C	LANDSCAPE DESIGN AND SITE PLANNING	**After Completion of the Course, the Students will be able to** **CO1:** Landscape design process and information needed to make space visually and psychologically. **CO2:** Understanding the design philosophy behind of history of landscape architecture. **CO3:** To learn about the variety of trees and plants. The benefits we get from planning them in different conditions.
AR17B4.2C	BUILDING CONSTRUCTION-IV	**After Completion of the Course, the Students will be able to** **CO1 :** Ability to use concrete as a versatile material in different contexts. **CO2:** An understanding of the concepts of concrete as a building construction material. **CO3 :** Ability to design and detail specific components in concrete where there is scope for architectural design. **CO4 :** Ability to use concrete innovatively in simple projects. **CO5 :** Applying the above gained Knowledge in a Simple Small scale design.

AR17B4.3C	DESIGN OF STRUCTURES –I	**After Completion of the Course, the Students will be able to** **CO1:** Ability to design timber beams and columns by applying the code provisions. **CO2:** Ability to design steel joints for maximum efficiency and strength . **CO3:** Ability to design tension and compression members for different conditions by applying the code provisions . **CO4:** Ability to design different types of laterally unsupported & supported beams for different conditions **CO5:** Ability to design different types of steel structures and its executions .
AR17B4.4C	HISTORY OF ARCHITECTURE- III	**After Completion of the Course, the Students will be able to** **CO1 :** An understanding of modernity as a fundamental transformation in Western society that spread across the world and the resultant architectural production. **CO2 :** An insight into the development of modern architecture. **CO3 :** An understanding of architecture in India under influence of colonialism and colonial modernity. **CO4 :** Knowledge of Famous Architect's Work and their styles. **CO5 :** understanding the Architectural Styles and monumental buildings in India.

AR17B4.5C	BUILDING SERVICES – II	**After Completion of the Course, the Students will be able to** **CO1:** Knowledge of basics of electrical, lighting and acoustic systems in buildings. **CO2:** Understanding the Various types of lights and different techniques in market. **CO3:** Ability to design buildings satisfying electrical, lighting and acoustic principles. **CO4:** Ability to design basic electrical, lighting and acoustic systems for buildings. **CO5:** Understanding the factors of Environmental Acoustics with types of treatment involved in it.
AR17B4.7C	COMPUTER APPLICATIONS-I	**After Completion of the Course, the Students will be able to** **CO1:** To Introduce students and initiate into theory and practice of Computer Applications in Architecture **CO2:** To familiarize students with computers so as to understand complete management outlook of an architects' office besides architectural drawings **CO3:** To teach graphic applications specially 2Dimensional for fast and attractive presentation of theme and ideas. **CO4:** To teach utilization of knowledge of 3D modeling and its application in design.

AR17B5.1C	ARCHITECTURAL DESIGN – IV	**After Completion of the Course, the Students will be able to** **CO1:** Ability to understand the nature, needs and ways of contemporary urban society as well as relate the existing built environment as a reflection of this. **CO2:** Ability to draw from this understanding and identify issues/ challenges involving contemporary urban life and the built environment. **CO3:** Ability to give appropriate/ innovative design solutions in the above context. **CO4:** Evaluate the Solutions and Proposal designs. **CO5:** Create a Live Design with Maximum Justification of Environment friendly and user friendly.
AR17B5.2C	BUILDING CONSTRUCTION - V	**After Completion of the Course, the Students will be able to** **CO1:** Learning of various preventive measures of building components(wall, floor, roof). **CO2:** Learning of various preventive techniques with the selection of materials. **CO3:** Learning of various material of building construction with their specification.

AR17B5.3C	DESIGN OF STRUCTURES –II	**After Completion of the Course, the Students will be able to** **CO1:** Ability to understand the different concepts of WSM and LSD methods using the code provisions. **CO2:** Ability to design reinforced rectangular Beams. **CO3:** Ability to design reinforced Concrete Slab. **CO4:** Ability to design reinforced Circular Slab. **CO5:** Ability to design reinforced Staircase.
AR17B5.4C	HISTORY OF ARCHITECTURE - IV	**After successful completion of course a student will be able:** **CO1:** Define the architecture of the post-medieval Western World as a result of the cultural, political, and economic contexts. **CO2**: Group Industrial revolution and the resulting architecture of eighteenth, and nineteenth-century in Europe. **CO3:** Sketch architecture with specific reference to form, technology and ornament. **CO4:** Categorize Revival architecture in Europe and America. **CO5**: Experiment contemporary architecture of the world concerning historical precedents. **CO6:** Create measured drawing and digital documentation of any site/ building/ part or features of a building related to the historical monuments.
AR17B5.5C	COMPUTER APPLICATIONS – II	**Upon completion of this course the student should be able to** **CO1:** Enhance and explore AutoCAD which aids them in presentations and design. **CO2:** Learning of 3d visualization and other graphics.

AR17B5.6C	BUILDING ESTIMATING, COSTING AND SPECIFICATIONS	**After Completion of the Course, the Students will be able to** **CO1:** To understand the art of building construction through specification writing. **CO2:** To create ability to work out the approximate estimate for small scale building projects and low cost housing. **CO3:** To create ability to work out the detailed estimate for small scale building projects and low cost housing. **CO4:** To understand the valuation. **CO5:** To understand the budgeting.
AR17B5.1E	WORKSHOP - VERNACULAR ARCHITECTURE (Elective – I)	**After Completion of the Course, the Students will be able to** **CO1:** An understanding of Indian vernacular architecture as a process and to also provide an overview of various approaches and concepts towards its study **CO2:** Knowledge of vernacular architectural forms in different regions. **CO3:** An understanding of the impact of colonial rule on vernacular architecture in India **CO4:** An understanding of vernacular architecture of south India **CO5:** An understanding of western influences on vernacular architecture of India

AR17B6.1C	ARCHITECTURAL DESIGN –V	**After Completion of the Course, the Students will be able to** **CO1:** To create ability to critically understand and address issue of resources . **CO2:** To create ability to balance diverse aspects/concerns of buildings by making informed choices and innovative design in the context of buildings with intense. **CO3:** To create ability to apply knowledge intensively in realms such as sustainable built environment, services. **CO4:** To address specific Situations /scenarios characteristics of urban life and context. **CO5:** To create ability to give appropriate/innovative design solutions in the above context.
AR17B6.5C	HUMAN SETTLEMENTS AND TOWN PLANNING	**After Completion of the Course, the Students will be able to** **CO1:** Understanding of evolution, pattern of human settlements & the process for the improvement of human living environment. **CO2:** Knowledge on various levels of planning, planning principles & the process over a period of time. **CO3:** Knowledge on scope and content of Urban planning. **CO4:** Understanding of Urban renewal and regional planning and the various plans to be prepared and planning activities are regulated in the state at various levels.

AR17B6.3C	ARCHITECTURAL ACOUSTICS	**After Completion of the Course, the Students will be able to** **CO1:** Understand the fundamentals of building acoustics with regards to the study of sound. **CO2:** Study the acoustics properties of typically used materials for design consideration. **CO3:** Define and analyze acoustics properties of the materials used in a usable space through calculations. Research on the same through market study. **CO4:** Design and interpret a room keeping in mind the parameters of room acoustics. **CO5**:Learn various ideologies and context of designs there by developing their own theories and applying the same knowledge in their own design skills.
AR17B6.4C	BUILDING ECONOMICS AND SOCIOLOGY	**After Completion of the Course, the Students will be able to** **CO1:**Students will learn about role of economics and sociology in architecture. **CO2:**Students will appreciate the various aspects of socio-economic structure of society.

AR17B7.1C	ARCHITECTURAL DESIGN –VI	**After Completion of the Course, the Students will be able to** **CO1 :** Ability to understand the wider implication of design decisions and their interdependency with larger processes of society. **CO2:** Ability to take creative, critical and informed decisions in the context of significant projects that could shape society in positive ways. **CO3:** Understanding the Building Codes and Standards. **CO4:** Understanding the concepts of Human Comfort and design Strategies of Campus design. **CO5:** Applying the gained Knowledge in Trending new design by innovative techniques.
AR17B7.1E	URBAN DESIGN	**After Completion of the Course, the Students will be able to** **CO1:** Awareness of the evolution and characteristics of urban forms, their components and Inter- dependencies. **CO2:** Understanding of Modern urbanism. **CO3 :** Understanding of urbanism through theories, aspects, issues and solutions. **CO4 :** Understanding contemporary urbanism and Urban interventions. **CO5 :** Knowledge of ways to look at and interpret urbanism today.

AR17B7.2E	HOUSING	**After Completion of the Course, the Students will be able to** **CO1:** Knowledge of professional code of conduct and ethics. **CO2:** Knowledge of various issues concerning housing & housing development in Indian & global context covering a cross section of income groups. **CO3:** Ability to appreciate socio-economic aspects in housing. **CO4:** An understanding of housing standards, site planning principles, housing concepts and types. **CO5:** An understanding of key issues in housing today.
AR17B7.3E	BUILDING CONSTRUCTION MANAGEMENT	**After Completion of the Course, the Students will be able to** **CO1:** The student is prepared to assume an entry level professional constructor's role as a member of a multi -disciplinary team in the construction industry. **CO2:** The student has the fundamental education that will lead to a leadership role in the construction industry. **CO3:** The student has developed an ethical and professional foundation to become a responsible member of society and the construction industry. **CO4:** The student has the fundamental skills in oral and written communication as required to effectively communicate in the construction industry.

AR17B7.4E	INTERIOR DESIGN	**After successful completion of course a student will be able:** **CO1:**To understand and remember the relationship between Architecture and Interior Design as a Space making disciplines. **CO2:** To understand and remember the thoughtful design of interior spaces & how it can increase efficiency and add depth and meaning to the built environment. **CO3:** To analyze the connection that the subject of Interior design has with other Design Disciplines like Conservation, Preservation, Restoration, Sustainability, Art, Product design and Graphic design. **CO4:** To position him/herself in today's time to be able to establish an argument and testify the same.
AR17B7.5E	LANDSCAPE ARCHITECTURE	**After successful completion of course a student will be able:** **CO1:**To use Landscape design as a tool to address environmental concerns in Architecture. **CO2:**To understand, remember the application of site planning principles in integrated design of open and built spaces. **CO3:** Analyze and Evaluate designs by Master Landscape Architects and their contribution to built environment. **CO4:** Analyze and Evaluate site and integrated design of open and built spaces. **CO5:** To create awareness using Landscape design as a tool to address environmental concerns in Architecture..

GN17B7.1A	PERSONALITY DEVELOPMENT	**At the end of the course, the student will be able to** **CO1:** Understand one's own self to face challenges of life. **CO2:** Pactice self discipline in order to realize the set goals. **CO3:** develop self confidence through concerted efforts. **CO4:** realise and value the importance of managing time; and handling emotions in different situations. **CO5:** build interpersonal and adaptability skills for a contented life.
AR17B8.1.1C	ARCHITECTURAL DESIGN –VII (DESIGN STUDIO)	**After Completion of the Course, the Students will be able to** **CO1:** Ability to observe and analyze the urban environment. **CO2 :** Ability to include the transportation nodes, heritage areas, adaptive reuse, suburban sprawl, place making. **CO3:** Understanding of this aspect of architecture will be achieved by architectural projects involving interdependencies between architecture and the city. **CO4 :** Ability to perceive and design buildings as contributing to/ transforming the urban fabric. **CO5** : Ability to bring inclusivity into the architectural design process**.**

AR17B8.1E	ARCHITECTURAL ILLUMINATION	**At the end of the course, the student should be able to** **CO1:** Understand the fundamentals of light, its source and designing of electrical lighting for different building typologies. **CO2:** Understand the physics and basics of sound, its propagation in spaces, acoustical defects of spaces and there mitigation and rectification. **CO3:** Understand about acoustical compliance of different facilities as per different codes.
AR17B8.2E	ARCHITECTURAL JOURNALISM	**At the end of the course, the student should be able to** **CO1:** Students shall be conversant with various terminologies to journalism in Architecture. **CO2:** Students shall learn various techniques of photography.
AR17B10.1C	DESIGN THESIS	**At the end of the course, the student should be able to** **CO1:** students are developed with required abilities to derive apt architectural solution with high quality drawings and technical write-up. **CO2:** students are confident to put-up to the challenges of the profession of architecture. **CO3:** Students are knowledgeable towards deriving the real needs of the projects, applicable norms, standards, techniques of drawing development. **CO4:** students have an ability to apply the knowledge gained to new situations. **CO5:** students can present their work effectively at various forums.

AR17B10.2E	INTELLIGENT BUILDINGS	**At the end of the course, the student should be able to** **CO1:** Students understand the need and advancement in technology contributing to the intelligent buildings concept. **CO2:** Students are familiar about the ideas of interface and components of building automation controls. **CO3:** Students are knowledgeable about various aspects of building intelligence and building automation. **CO4:** Students are familiar about various aspects of intelligent systems in buildings design. **CO5:** Students acquired an insight about the existing intelligent buildings in India and abroad through proper Case- Studies.
AR17B10.2C	PROFESSIONAL PRATICE & BUILDING CODES	**At the end of the course, the student should be able to** **CO1:** Student shall understand the roles of Indian Institute of Architects, and the Council of Architecture and **CO2:** Students shall be prepared for professional practice by understanding the liabilities, obligations, and responsibilities of a professional architect, and also understanding building bye-laws and regulations, and learning to apply the same. **CO3:** Students shall have learned about various prospects after graduation. **CO4:** Students shall be able to understand, analyze and evaluate various types of contracts, and will be able to issue Notice Inviting Tenders. **CO5:** Students shall understand the importance and types of competitions

JBR ARCHITECTURE COLLEGE
HYDERABAD

DEPARTMENT OF M. ARCH.ENVIRONMENTAL DESIGN

Course Code	Course Title	COURSE OUT COMES
ED 1.1	ENVIRONMENTAL DESIGN STUDIO–I	**At the end of the course, the student should be able to** **CO1:** Total understanding of interaction of Built Environment and ambient environment, climatic Design of Neighborhood which includes designing group of buildings, clusters,etc **CO2:** Application of site level strategies to create built mass to achieve positive influence on micro climate. **CO3:** Understanding of thermal behavior of walls, facade roof etc., and fenestration design of a unit. **CO4:** Design demonstration shall necessarily include the optimization of shadow mask to harness the advantages of mutual shading and to understand the wind pattern generated
ED 1.4	ENVIRONMENTAL LAWS	**At the end of the course, the student should be able to** **CO1** : Awareness on international developments and trends in environmental laws and legislations in India. **CO2:** Understanding Public Health and Safety and The Constitution of India. **CO3:** Understanding International Practices.

ED 1.2	ENERGY SIMULATIONS E.C.B.C – I	**At the end of the course, the student should be able to** **CO1:** Acquire knowledge on ECBC Compliance and approach: Energy efficiency performance levels, building systems, precedence, building classifications, energy performance index. **CO2:** Analyze approved analytical tools, administrative requirements, compliance documents, Benchmarking and Star Labelling. **CO3:** Overview on Application of simulation software on: geometry of buildings, Material and construction, Openings and shading, lighting and controls. Daylight Simulation, Heating and cooling design, Unitary HVAC Systems, Central HVAC System. **CO4** Evaluate Building energy code compliance, project: small office, Building energy code compliance, project large office.
ED 1.6	SEMINAR	**At the end of the course, the student should be able to** **CO1:** To understand the basics of technical paper writing. **CO2:** Analyze and investigate the selected topic . **CO3:** To present the research

ED 1.3	BUILDING PHYSICS	**At the end of the course, the student should be able to** **CO1:** The aim of the course is to introduce climatic parameters and to understand in depth the factors affecting comfort and strategies that lead to around/outside and inside the built space. **CO2:** Interpretation of climatic data through Climate Data and Acoustics. Use of instruments like data loggers/ anemometer for thermal/ wind data recording and carrying out related studies/exercise. **CO3:** Calculation of U value for various combination of building materials and contemporary construction methods. **CO4:** Calculations of heating/cooling loads based on the building materials typologies. **CO5:** Design Strategies (Outdoor and Indoor) Modifications of Architectural elements for thermal comfort and appropriate ventilation, etc.
ED 2.1	ENVIRONMENTAL DESIGN STUDIO–II	**At the end of the course, the student should be able to** **CO1:**Understand environmental issues and concerns at urban scale (5 hectares) and context. **CO2:** apply the theoretical knowledge of these and sustainable design principles to specific projects affected by these issues. **CO3:**Conceptual design strategies for Sustainable Development of public realm at urban scale & context.etc.

ED 1.5	SUSTAINABLE DEVELOPMENT AND PLANNING	**At the end of the course, the student should be able to** **CO1:** To introduce the scale of macro planning and its relationship with micro level planning (site planning). **CO2:** Understanding to mitigate climate change issues at neighborhood Level. **CO3:** analyze steps involved in sustainable urban design projects. **CO4:** comprehend the cross sectoral relationship between various components of urban planning, viz. transportation planning, land suitability analysis, infrastructure planning and socioeconomic planning. **CO5:** Introduce the concept of environmental planning and expose to the emerging concepts in sustainable planning like, smart city concept, eco-city concept, etc.
ED 2.2	ENERGY SIMULATIONS ECBC – II	**At the end of the course, the student should be able to** **CO1:U**nderstanding of advance concepts in building energy efficiency and how to model them. Understand advance electrical and mechanical systems and how to integrate them in design. **CO2:E**valuate high performance buildings leading to net zero building design. **CO3:**Modeling and simulating various aspects of low energy building design.

ED 2.3	RESEARCH METHODS	**At the end of the course, the student should be able to** **CO1:** Learn methods and processes of research. **CO2:** understand their significance in general and with reference to environmental design context. **CO3:** a focused study based upon a research question and compilation of study material. **CO4:** demonstrate the steps in the research process brief assignments. **CO5:** present the learnings in the form of a research paper.
ED 2.4	BUILDING ENERGY MANAGEMENT	**At the end of the course, the student should be able to** **CO1:** Learning sources and supply of energy and its integration with planning and design of built environment; global energy scenario, introducing the various types of renewable resources and appropriate technologies & harnessing strategies and policy of energy security and environmental protection. **CO2:** Case studies on Energy management / Alternate sources of Energy. **CO3:** present the Learnings as seminar / discussions.
ED 2.5	RESOURCE MANAGEMENT AND ECOLOGY	**At the end of the course, the student should be able to** **CO1:** Evaluation of Ecology, Man and Ecosphere, Components of nature. **CO2:** Analyse integrated planning approach to resources development management, traditional and contemporary approaches to resource development in India. **CO3:** Evaluate few selected case studies.

ED 2.6	SUSTAINABLE SITE PLANNING AND LANDSCAPE DESIGN	**At the end of the course, the student should be able to** **CO1:** At the end of the course student will be able to consider Sustainable Site Planning Principles in the design of built environment. **CO2:** At the end of the course student will be able to consider Sustainable and climate responsive aspects in Landscape design. **CO3:** At the end of the course students will be able to analize and evaluate case studies on sustainable issues.
ED 3.1	ENVIRONMENT DESIGN LAB/STUDIO-III	**At the end of the course, the student should be able to** **CO1:**Understanding a comprehensive design approach, to achieve energy efficiency in built environmental design. **CO2:**Analyse and develop creative skills, abilities, judgment and control in the design of built environment. **CO3:**Design/Retrofitting of Buildings / campuses for energy efficiency. Focus should be on buildings/campuses which are conventionally energy guzzlers. **CO4:**To study and document, understand and analyze the energy consumption levels & patterns of any IT campuses, commercial complexes/malls, health campuses etc
ED 3.2	ENVIRONMENTAL IMPACT ASSESSMENT	**At the end of the course, the student should be able to** **CO1:** Learn the role of impact assessment and the Phases of impact Assessment. **CO2:** Understand the Rational for Environmental Impact Assessment.

ED 3.3	ENVIRONMENTAL RATING SYSTEMS	**At the end of the course, the student should be able to** **CO1:** Understand the various tools and methods associated with the field of environment such as Energy Audit, Life Cycle Assessment, Carbon Footprint and Mapping, Green Building Rating Systems, GRIHA, LEED Ratings, Any other Rating systems which are suitable. **CO2:** Case studies of Green certification buildings, leed certified buildings.
ED 3.4	SUSTAINABLE PRACTICES IN WASTE MANAGEMENT	**At the end of the course, the student should be able to** **CO1:** comprehensive understanding of waste management from an environmental public health perspective. **CO2:** Analysis of an integrated solid waste handling system including source reduction, recycling and reuse, composting, land filling and combustion by way of case-studies. **CO3:** Understand Quantity of sewage, quantity of storm water, run off, time of concentration, design of sewers,flow diagrams, laying of sewers, sewer appurtenances. **CO4:** Design and layout of sewerage system.

ED 3.5	ENVIRONMENTAL INFRASTRUCTURE	**At the end of the course, the student should be able to** **CO1:G**eneral understanding of various issues and approaches to planning, designing, and maintenance of Infrastructure. The major emphasis in this course will be on water supply, sewerage, storm water drainage, roads and soil water management. **CO2:**Understanding Concepts and theories for design and operation of electricity networks, power generation (conventional and non-conventional) communication networks like telephone facilities, WLL, cable TV, Fibre optic and other broadband communications networks, etc. Integrated Infrastructure Planning. **CO3:** Analyse Case Studies in India.
ED 3.6	RESEARCH METHOD - II	**At the end of the course, the student should be able to** **CO1:E**xplore and to study central issues related to environmental architecture from past, to the present day and future **CO2:**The topic of the research paper to be selected. **CO3:D**evelop an appropriate methodology and research approach related to the Environmental Architectural Project taken up in semester-IV. **CO4:**Research dissertation need to be submitted based upon the topic approved. **CO5:**The student shall present a paper (in a conference / journal) on a topic.

ED 4.1	ENVIRONMENTAL ECONOMIC FEASIBILITY	**At the end of the course, the student should be able to** **CO1:** understand and relate the issue related to Economic Feasibility of the project chosen in the thesis.The focus shall be on environmental aspects of the project. **CO2:** Preliminary Analysis, Market, Technical, Financial, Economic and Ecological. **CO3:** Pre-Feasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report.
ED 4.2	ENVIRONMENTAL DESIGN THESIS	**At the end of the course, the student should be able to** **CO1:** Identify the title for environmental design thesis, the area chosen shall be multidisciplinary & addressing present or immediate future situations of the environment. **CO2:** Apply Appropriate methodology, which will include literature reviews, case studies & Analysis. **CO3:** Conduct primary & secondary surveys leading to synthesis of the Environmental design project. **CO4:** Design demonstration as an end product.

JBR ARCHITECTURE COLLEGE
HYDERABAD

DEPARTMENT OF M. ARCH.INTERIOR DESIGN

Course Code	Course Title	COURSE OUT COMES
ID 1.1	THEORY OF AESTHETICS & DESIGN	**CO1:** At the end of the course students will be able to clarify the definition of design & aesthetics. **CO2:** At the end of the course students will be able to clarify the purpose of design and various fields of design. **CO3:** At the end of the course students will be able to describe the nature of good design on the theoretical basis to all present day design disciplines. **CO4:** At the end of the course students will be able to clarify the issues of idea & theme as ordering mechanisms – of space, material, form, colour & light. **CO5:** At the end of the course students will be able to clarify about perception and response to visual phenomena. **CO6:**At the end of the course students will be able to clarify the Gestalts principles.

ID 1.2	INTERIOR DESIGN MATERIALS & CONSTRUCTION	**CO1:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Wood – Soft, hard, panelling, plywood, boarding and their use in the construction of floor, walls, ceilings, doors, windows, staircase, built in furniture and other components of interior architecture. **CO2:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Metals – Steel, iron, aluminum, bronze, brass, copper and their use in the construction of floor, walls, ceilings, doors, windows, staircase, built in furniture and other components of interior architecture. **CO3:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Masonry – Stone, concrete, brick, tiles, gypsum, plaster and their use in the construction of floor, walls, ceilings, doors, windows, staircase, built in furniture and other components of interior architecture. **CO4:** At the end of the course students will be able to describe the system of construction & details of market surveys, case studies and site visits. **CO5:** At the end of the course students will be able to prepare a portfolio of study of material application.

ID 1.3	ENVIRONMENTAL SCIENCE FOR INTERIORS	**CO1:** At the end of the course students will be able to describe the thermal comfort, Importance of human comfort in interior spaces, Heat flow within buildings, Thermal properties of materials , Climate and material choices for interior spaces , Human response to the thermal environment. **CO2:**At the end of the course students will be able to describe about lighting, Lighting in interiors, Lighting levels & criteria, Natural & artificial lighting , Selection of lighting, Lighting devices available in the market and their characteristics , Economic issues , Fixture selection and placement – floor, table, desk, wall & ceiling units, Psychological impact on human moods & emotions. **CO3:**At the end of the course students will be able to describe about acoustics Behaviour of sound in enclosed spaces, Understanding acoustics and its integration with interior design Sound absorbents – porous materials panel or membrane absorbers, resonators.

ID 1.4	CAD AND VISUALIZATION	**CO1:** At the end of the course students will be able to give a brief review of computer hardware and software required for interior architectural applications **CO2:** At the end of the course students will be able to work in AUTOCAD for preparing drawings including plans, elevations and section understanding of the techniques **CO3:** At the end of the course students will be able to do construction of models: working in 3D to construct wireframe modeling, surface modeling, solid modeling, etc. - understanding of the processes and techniques **CO4:** At the end of the course students will be able to do rendering by understanding the processes and techniques, Hidden surface removal, assigning shades, limited to simple exercises.
ID 1.5	SEMINAR	At the end of the course students will be able to give presentation of a written paper and a seminar at the end of the semester based on extensive literature reviews, cast studies (wherever possible), interviews, market surveys etc. on any of the following topics: - Role of an interior designer in a project - Interiors as a response to social and technological forces - User participation in design - Decorative accessories in interiors - Occupant health & safety in interiors - Signage & Graphics - Optical Illusions - Modular Co-ordinations - Kitchen & bath design - Storage design - New materials - Basic structural systems

ID 1.6	INTERIOR DESIGN STUDIO – I	At the end of the course students will be able to prepare the design portfolio done with two interior schemes of different functional types viz residential, commercial, banks, restaurants, café etc. and institutional (relating to education & health) forming the major design assignments - the design process involving literature studies, case studies, site visits, data collections and analysis eventually resulting in a interior scheme where theme based design is emphasized - the design exercise addressed issues such as institution character through interior environment, corporate image, economic factors & behavioural patterns; integration of commercial activity etc. - design portfolio included furniture layout, electrical layout, false ceiling plan, partition designs & details, flooring plan, design of doors & windows, colour schemes etc, specifying materials usage and the related technical knowledge - two time problems also being included on specialized product display systems, show case windows at street levels, graphic & signage design etc.
ID 4.5	DISSERTATION	At the end of the course each student will be able to prepare a dissertation under a department approved guide /adviser - the topic chosen will preferably relate to the design project and will involve the following areas of study: - An in-depth investigation into any aspect of the chosen area - Analysis of data, inferences to establish underlying principles - Evaluation of existing theory in new concepts - Establishment of a hypothesis and its substantiation

ID 2.1	THEORY AND HISTORY OF INTERIOR DESIGN	**CO1:** At the end of the course students will be able to describe the land mark events in the history of International design movement and the historical development of artifact **CO2:** At the end of the course students will be able to give overview of the major styles and the Industrialization : changes in technology and production systems - Impact on life style and interiors. **CO3:** At the end of the course students will be able to describe about the modern movement and its impact on India and the shift from historical to modern methods of building spaces,change in the interior elements of design and interior architecture. **CO4:** At the end of the course students will be able to explain the various schools of thought and design emphasis and interior Design in the Indian context, contemporary styles with particular reference to India, Indian elements of space making,Anthropometrics, Ergonmiscs, Proxemics, and behavioural issues. **CO5:** At the end of the course students will be able to describe the elements of Interior Design including floors, walls, ceiling, lighting, furniture, furnishings and indoor landscape and clarify the metaphor as a tool in the design process,graphics & signage and its applications.

ID 2.2	INTERIOR DESIGN MATERIALS & CONSTRUCTION – II	**CO1:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Glass – Window, plate, tempered, mirror, block etc. and their use in the construction of floor, walls, ceilings, doors, windows, stairs, built in furniture, fixtures and other components of interior architecture. **CO2:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Plastics – Transparent, laminate, tile etc. and their use in the construction of floor, walls, ceilings, doors, windows, stairs, built in furniture, fixtures and other components of interior architecture. **CO3:** At the end of the course students will be able to describe the physical, behavioural and visual properties of Textiles – Drapery, upholstery, wall covering, carpets, durries etc. and their use in the construction of floor, walls, ceilings, doors, windows, stairs, built in furniture, fixtures and other components of interior architecture. **CO4:** At the end of the course students will be able to describe the physical, behavioural and visual properties of miscellaneous materials such as linoleum, asphalt, cork, rubber, leather, paper, rexine, paints & finishes and their use in the construction of floor, walls, ceilings, doors, windows, stairs, built in furniture, fixtures and other components of interior architecture. **CO5:** At the end of the course students will be able to describe the system of construction of market survey, case studies and site visits. **CO6:** At the end of the course students will be able to prepare a portfolio of study of material application.

ID 2.3	BUILDING SERVICE SYSTEMS FOR INTERIORS	**CO1:** At the end of the course students will be able to do plumbing and drainage, implications on interior layouts. **CO2:** At the end of the course students will be able to prepare electrical layout scheme for a interior using standard electrical symbols, Indian electricity rules, relevant provisions of N.B.C. **CO3:** At the end of the course students will be able to clarify HVAC – Air-conditioning, methods and equipment, air distribution systems – ducts, air inlets and will also be able to calculate of AC loads, will be able to clarify zoning – purpose & advantage, Elevators & Escalators, will be able to define and will be able to clarify application, location & arrangement of conveyor belts. **CO4:** At the end of the course students will be able to describe and will be well versed about fire safety; role of an interior designer in ensuring fire safety and fire safety regulations of NBC. **CO5:** At the end of the course students will be able to desribe about provisions made for services like cable TV, PABX, burglar alarm, other security systems.
ID 3.1	PRACTICAL TRAINING	At the end of the practical training period students will be able to submit a detailed report with a set of drawings(working drawings, presentation drawings, presentation drawings, quantity estimating, site supervision, municipal drawings, etc.) on at least two projects on which she/he has worked during the twenty two calendar weeks of the practical training period.

ID 2.4	FURNITURE DESIGN & DETAILING	**CO1:** At the end of the course students will be able to analize the form, function & technical aspects of existing furniture **CO2:** At the end of the course students will be able to do measured drawing of existing furniture – plan, elevations and details. **CO3:** At the end of the course students will be able to describe history of furniture from early days to industrial resolution, various styles, systems and products available in market, scientific way of designing any two types of furniture systems based on ergonomics, materials, working parameters and visual perception. **CO4:** At the end of the course students will be able to draw details and will be able to do models. **CO5:** At the end of the course students will be able to clarify cost criteria of design & mass production of furniture forms and will be able to describe about modern furniture designers such as Ward Bennet, Alvar Aalto, Owen Jones, Florence Knoll, Mies van der Rohe, George Nelson, Henri van de velde, Hans Wegner etc.

ID 2.5	CRITICAL RESEARCH SEMINARS	**At the end of the course students will be able to describe research Methods:** **C01:** Studies of Indian art & craft. Influence of location, tradition, culture and socio-economic development on art & craft in rural & urban India. Visit to traditional craft pockets, documenting people, life, culture & craft and understand the materials, tools, technology, processes and forms. Suggest suitable changes in technology to improve the products so as to make it acceptable in today's context. **CO2:** Studies of the work of different interior designers through observation, interview and research. Understanding of the concepts of space, structure, organization, symbolism, form, colour, modes of presentation etc. **CO3:** The student may chose any other area of interest in consultation with the concerned faculty for research. The study would be presented as a term paper with supporting illustrations and will also be able to present a final seminar.
ID 4.4	INTERIOR DESIGN PROJECT	At the end of the course students will be able to submit the final portfolio containing comprehensive proposals for the interior(live project wherever possible) clearly indicating the scope of work, methodology, objectives and case studies supported by drawings, illustrations and models

ID 2.6	INTERIOR DESIGN STUDIO – II	At the end of the course students will be able to do design exercise reflecting the assimilation of knowledge of various streams and following the design process of data collection, analysis, review & study of two interior schemes of different functional types viz commercial (shopping malls), recreational, (theatres, clubs, etc) and public use complexes (airports, bus terminals, railways stations), addressing issues like design language, visual coordination, culture, traditions and behaviour patterns in the use of space and will be able to prepare design portfolio including furniture layout, electrical layout, false ceiling plan, partition design, flooring plans, design of doors & windows, colour schemes, surface treatments etc.students will also be able to do time problems based on exhibition display or special purpose interiors such as barrier free interiors of public areas; interiors for children or the elderly
ID 2.7	WORKSHOP – II	**CO1:**At the end of the course students will be able to do ceramic workshop by understanding of ceramic products for interior spaces, processes and techniques of forming & decorating ceramics slab work, throwing, pinching, coil work and firing, colour figments and design qualities. **CO2:** At the end of the course students will be able to do metal workshop by understanding types of metals, properties, methods of working with metals, fixing and joinery in metals, finishing and treatment of metals, metal products & furniture forms used in interiors **CO3:** At the end of the course students will be able to do plastic workshop by understanding Plastic, F.R.P and acrylic products – design process, tools & technology, development of innovative forms for interiors elements with colour variations.

ID 4.1	DESIGN PRESENTATION THROUGH MULTI-MEDIA	**CO1:** At the end of the course students will be able to use computers for documentation and presentation including graphic design, 3D modelling, color rendering, lighting effects, animation, image editing, video editing, sound editing, interactive simulation and web design. **CO2:** At the end of the course students will be able to work on interactive multi-media technology and its use in interior architecture **CO3:** At the end of the course students will be able to work on use of suitable applications of 3 D studio, Alias & character studio for modelling, rendering and animation, Adobe photopshop & Adobe illustrator for graphic design & touch-ups, Aldus photostyle, Adobe premiere, sound forge, Director & Razor pro for image editing, Audio-Video editing, Power point for computer stills & slides, Alternative software applications.

ID 4.2	INTERIOR PROJECT MANAGEMENT & PRACTICE	**CO1:**At the end of the course students will be able to describe interior project management, its objectives, resources and team. **CO2:**At the end of the course students will be able to clarify about client contacts and relationship issues, design development stage and co-ordination with various agencies, execution of work – planning, scheduling and control, project monitoring, programming of works, tools & techniques for project management; bar charts, network techniques **CO3:**At the end of the course students will be able to do project cost analysis considering the methods of estimating, total budgeting and schedule of payment of various agencies. **CO4:**At the end of the course students will be able to describe about Interior Design profession by doing survey of various interior designers, working procedures, fee systems, professional Interior Design Societies; Licensing and Registering

ID 4.3.1	INTERIOR LANDSCAPING	**CO1:** At the end of the course students will be able to clarify about elements of interior landscape **CO2:** At the end of the course students will be able to clarify about the types of indoor plants, plant characteristics; size, biology, soil, moisture, light, nutrient, atmospheric conditions, growing medium, pests & diseasesand will also be able to do market survey for costs **CO3:**At the end of the course students will be able to describe about flowers, its colours, texture and its visual perception in various indoor spaces, science of flower arrangement **CO4:**At the end of the course students will be able to do manual versions automatic irrigation costing and installation of micro irrigation systems **CO5:**At the end of the course students will be able to do interior landscape application for residential, commercial and other public use spaces

ID 4.3.2	ERGONOMICS AND PRODUCT DESIGN	**CO1:**At the end of the course students will be able to describe about ergonomics – its basic theory and relationship with human comfort criteria. **CO2:**At the end of the course students will be able to clarify about the ergonomic principles in design process and product design. **CO3:**At the end of the course students will be able to describe about the principles of product design – user centric, theme, metaphor, contemporary trends – Fabrication and proto typing techniques, material & processes employed as per industry standards **CO4:**At the end of the course students will be able to work on computer aided product design – scope, areas of application, software available **CO5**:At the end of the course students will be able to work on creative engineering design - principle mechanisms & linkages

ID 4.3.3	PSYCHOLOGY & HUMAN BEHAVIOUR	**CO1:**At the end of the course students will be able to do analysis of human mind & his / her image world and will also be able to describe about human being and social behaviour patterns in various public and private areas. **CO2:**At the end of the course students will be able to describe about human behaviour in a group of two, three and more, activities and its relationship with grouping of people, Privacy, Territoriality & defensible space. **CO3:**At the end of the course students will be able to describe about modernization, change in society, change in thought process and behaviour patterns. **CO4:**At the end of the course students will be able to clarify about the behaviour patterns and its correlation to design elements. **CO5:**At the end of the course students will be able to describe about the reflection of behaviour patterns of human being in space planning for public areas like theatre lounge, waiting rooms, hotel foyer, café and other spaces.