SHRI VASANTRAO BANDUJI PATIL TRUST'S

APPASAHEB BIRNALE COLLEGE OF ARCHITECTURE, SANGLI

(Approved by AICTE, C.O.A New Delhi, Affiliated to Shivaji University Kolhapur)
District – Sangli 416416

Criterion II

Teaching- Learning and Evaluation

Key Indicator- 2.6 Student Performance and Learning Outcome

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South Shivajinagar, Sangli Miraj Road, Sangli-416146. Ph. No- (0233) 2320294, 2322336.

Website- www.abcasangli.edu.in Affiliated: Shivaji University Kolhapur

Principal: - Dr. Arundhati P Wategave Ph.D.

CRITERIA II

Key Indicator 2.6 STUDENT PERFORMANCE AND LEARNING OUTCOME

ANNEXURE – 2.6.1

PROGRAM OUTCOMES (POS), COURSE OUTCOMES (COS) FOR ALL PROGRAMS

Sr.no	List of Particulars
1.	Program Outcomes (POs), program specific outcomes and Course Outcomes (COs) for all programs offered by the Institution

ESTD. 1993

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CRITERIA II

Key Indicator 2.6 STUDENT PERFORMANCE AND LEARNING OUTCOME

ANNEXURE – 2.6.1

2.6.1 Program Outcomes (POs), program specific outcomes and Course Outcomes (COs) for all programs offered by the Institution are stated and displayed on website and attainment of POs and Cos

PROGRAM OUTCOMES FOR ARCHITECTURE PROGRAM: (PO'S)

P.O.1. Purpose of Architectural studies: Apply understanding of building materials, spatial geometry, history, and human behaviour to solve complicated architectural issues.

P.O.2. Problem analysis: Identify, formulate, research literature and analyse complex Architectural problems reaching authenticate conclusions using Principles of Design, natural sciences and construction technology including innovative methods.

P.O.3. Program development for solutions: Design components or processes that meet the given needs while taking into account public health, safety, cultural, socioeconomic, and environmental factors. Create solutions for complicated architectural challenges.

P.O.4. Perception of problems: Data collection, experiments, interpretation and analysis synthesis of the information to provide valid support to architectural solutions.

P.O.5. Progressive use of modern tools and techniques: To predict, analyse, and design with consideration for constraints, develop, pick, and use appropriate methods, resources, and IT tools.

P.O.6. Philanthropy and The Architect: Apply perceptive information and contextual knowledge to assess societal, health, safety, and cultural issues to arrive at the responsible architectural solutions.

P.O.7. Planet responsive: Comprehend the impact of architectural solutions in addressing environmental issues in societal contexts towards a sustainable development.

P.O.8. Professional Ethics: Commit to professional ethics and responsibilities and norms of Architectural practice.

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P.O.9. People friendly: Be an excellent team member in diverse teams for collaborative working along with individual responsibilities to function effectively.

P.O.10. Persuasive Communication: Communicate effectively on complex Architectural activities with the society at large, with effective written reports, documentation drawings and presentation drawings and give and receive clear instructions.

P.O.11. Project management and finance: Understanding of project's management principles and application to one's individual work in multiple environments as a member and leader in a team to manage projects in multidisciplinary environments.

P.O.12. Permanent and continuous Life-long learning: Appreciate the importance of autonomous, lifelong learning, and possess the necessary skills and knowledge to do so in the context of technological development as a whole.

PROGRAM SPECIFIC OUTCOMES FOR ARCHITECTURE PROGRAM: (PSO'S)

PSO. 01: Integrated Design Solutions:
Students, who graduate from A.B.C.A will be able to comprehend and analyse impact of their design solution based on the study and analysis of multiple, theoretical, social, political, economical, cultural and environmental contexts.

PSO. 02: Creative skills and knowledge with exposure to associated fields:
Graduate students will be able to implement and experiment in different creative fields to achieve an altruistic and relevant status for betterment of the society and for nation building.

PSO. 03: Team working with various consultants and agencies:
Graduates develop the ability to co-lead teams of stakeholders in the design, development and implementation of solutions to problems in the built and natural environment**.**

PSO. 04: Professional Practice with Ethical and societal concerns:
Graduates from A.B.C.A. shall understand the ethical practice of Architectural profession including management and the need to act legally and critically for the betterment of the client, society and environment.

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COURSE OUTCOME FOR ARCHITECTURE PROGRAM:

First Year B.Arch. Sem-I **Old Syllabus** **Years** (2017-18, 2018-19)

Subject code	Subject Name		Course Objectives and Outcome
AR01-01	Aesthetics & visual arts – I	**CO-1**	To develop within students' manual presentation skills like, sketching and rendering
		CO-2	To understand and relationship of surface from space masses, point, line, light, and shade, aesthetics in motion, sound, touch and smell.
		CO-3	To learn Aesthetics as part of mind, with the knowledge of Colour theory, colour circle, various colour schemes and their combinations, general psychological effects of colours.
		CO-4	To learn appropriate use of Elements of design such as line, form & shape, colour& texture, patterns etc.
AR01-02	Graphics – I	**CO-1**	To introduce students to drawing instruments such as drawing board set-squares tee-square French curve, stencils, different types of pencils and pens and their uses. architectural drawing techniques and to the language of graphics, its vocabulary and grammar such as scale, annotations, labelling and dimensioning
		CO-2	Introduction of various media of drawing and presentation such as pencil, charcoal crayon, water colour, sketch pens, inks etc. and exercise using all these media.
		CO-3	Scale drawing, construction of various metric scales, normally used scale, use of metric scale for various purposes. • Introduction and understanding of plan elevation and section. • Measured drawing of small objects, such as building elements, pieces of furniture and small built forms.
		CO-4	• Solid geometry to explain the need of solid geometry in architectural drawings such as techniques of presenting three-dimensional drawing into two dimensional objects. Exercise involving geometrical forms, presented in different positions of individual object and then in group.

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		CO-5 **CO-6** **CO-7**	To enable students to express simple three-dimensional objects and building components through Technical Drawings, using various graphic projection systems such as orthographic, Isometric and Axonometric projections. To introduce various techniques of sketching for recording, studying and communicating objects, buildings and building components
AR01-03	Architectural Design – I	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	To learn Application of elements of design to achieve design principles and in creative work. • Approach to Design as a continuous process through Aesthetics, function and Technology (construction) Basic components of a building and their functions. • Principal of Design with reference to function, various activities and related spaces. Data collection, Environments, climate, orientation, site conditions, Circulation. • Study of basic human Needs, Various requirements, standard measurements of Human activities and allocation of Spaces. • Study & comparison of single units like living spaces, sleeping and cooking spaces, stalls, bus-stops, telephone booths etc. detailed design of single room for simple function, showing relationship with adjoining areas for other activities not more than 25 sq. metres. • Role of interior design in planning and Architecture
AR01-04	Human Settlement & History of Civilization	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5**	The study of this in intended to understand the process of evolution and development in social, economical and cultural environment of man with emphasis on establishing their direct relationship with Architecture. • Brief history of evolution of human settlement from ancient times today in Western countries and ancient India. 1. Settlement in prehistoric period 2. Civilization of Fertile Crescent Mesopotamian. 3. Greek civilization 4. Roman civilization 5. Ancient Indian civilization Mohen-jo-Daro Vedic period. 6. Buddhist culture in India. 7. Rise of Islam in mid Asia. • Man, and with environment: Biological and behavioural responses to metropolitan to human settlements design with natural and built environments. • Settlements in villages and in small, medium and large towns, metropolitan cities, their characteristics and relationship for industrial, educational, cultural and religious activities etc. • Introduction to scope of term “Culture and Civilization” and their dialogue with architecture.

AR01-05	Building Construction & Material – I	**CO-1** **CO-2** **CO-3** **CO-4**	To help students understand the basic building elements, their function and behaviour under various conditions with specific reference to load bearing construction. To help students to develop a clear understanding of the basic principles of construction and materials suitable for load bearing construction To help students develop and analytical and logical sequence in thinking about structural aspects of architecture. To encourage a mix of classroom and field learning.
AR01-06	Theory of Structure – I	**CO-1** **CO-2** **CO-3** **CO-4**	To Introduce Applied Mechanics as an important Subject for Architecture. To Understand Different Systems of Forces and their Equilibrium and that a Building is a System of Forces in Equilibrium. To Introduce and Understand Concepts of Support, Support Reactions, Beams, Loads, Bending and Shear. To understand Types of friction, laws of dry friction, problems on block, wedge and ladder.
AR01-07	Workshop – I	**CO-1**	To understand students about various materials and techniques used in making Architectural models. Enabling Students to make Architectural models with paper, paper board, plastics, plaster of Paris, wood and clay, for study and presentation.
AR01-08	Communication Skills – I	**CO-1** **CO-2**	Introducing various communication skills in the society. To enable Students to make presentation in front of mass communication.
AR01-09	Computer Technology in Architecture - I	**CO-1**	To learn windows, use and importance, Comparison with dos application Use of pointing devise style types parts of windows. Concept of dialogue boxes Window application Concept of tab work in windows. Concept of data interchange

First Year B.Arch. Sem-II	**Old Syllabus**		**Years** (2017-18, 2018-19)
Subject code	**Subject Name**		**Course Objectives and Outcome**
AR02-01	Aesthetics & visual arts – II	**CO-1**	To create awareness about principle of good design to develop good aesthetic taste understand of Architecture and different fine arts and their application to study the principle of architecture, interior design, house design, advertising, city planning. etc
AR02-02	Graphics – II	**CO-1** **CO-2**	To develop the drawing skills as tools for creative thinking, visualization, perception, imagination and representation Perception and representation of simple architectural shapes, forms and basic elements of building
AR02-03	Architectural Design – II	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	To introduce the students to the iterative design process and various channels of creativity. To develop representational skills and architectural design principles within students Understanding anthropometry and its architectural design implications Introduce to students the various elements of architectural space making To make students explore in design of built form with reference to climate To develop skills within students to develop design proposal in the form of sketches drawings and models Design problems dealing with planning for activities such as individual living, units shops, stalls, snacks bars, with three to four functions of total area up to 80 sq. mtrs .
AR02-04	Human Settlement & History of Civilization	**CO-1** **CO-2** **CO-3** **CO-4**	To understand comparative study of various civilization • Study of impact of religion and culture on house, housing and other human activities. • Human settlements in ancient medieval modern period in India Europe and other parts of the world. i.e. Dark ages, Gothic, Renaissance, Industrial revolution & modern period. • Characteristics of human settlements during regimes of Hindu, Muslim and other rules in India. Medieval & Modern period in India. • Settlement in villages, medium & large towns, metropolitan cities and their characteristics and relationship for Industrial and religious activities etc.
AR02-05	Building Construction & Material – II	**CO-1**	To help students understand the basic building elements, their function and behaviour under various

		CO-2 **CO-3**	conditions with specific reference to timber construction. To help students to develop a clear understanding of the basic principles of construction and materials suitable for load bearing construction. To help students develop and analytical and logical sequence in thinking about structural aspects of architecture."
AR02-06	Theory of Structure – II	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	Analysis of trusses: Definition of perfect, deficient & redundant trusses. Analysis of determinate trusses by method of joints, sections and graphical method. • Simple Stresses and strains: concept, definitions, units, types of stresses and strains. Stress strain curve, safe stresses, factor of safety, different types of safe stress as per ISI code for different materials like timber, steel. Hook's law, typical stress strain behaviour for steel and concrete. • Elastic constants: modulus of elasticity, Poisson's ratio, modulus of rigidity, bulk modulus, shears modulus and their relations. • Properties of sections: centre of gravity, moment of inertia, modulus of section, radius of gyration of simple symmetrical and unsymmetrical sections including built up sections. • Bending Moment & Shear force: concept of shear force and bending moment. BMD & SFD for statically determinate simply supported and cantilever beams subjected to combinations of concentrated, uniformly distributed, uniformly varying loads. Point of contra flexure in simply supported beams with overhang.
AR02-07	Workshop – II	**CO-1** **CO-2** **CO-3**	Introducing students to various materials and techniques used in making Architectural models. Enabling Students to make Architectural models for study and presentation. To introduce computer aided 3D modelling.
AR02-08	Communication Skills – II	**CO-1** **CO-2**	Introducing various communication skills in the society. Enabling Students to make presentation in front of mass communication.

AR02-09	Computer Technology in Architecture - II	**CO-1** **CO-2**	To learn and practice Cad and advanced application. Different types of styles for e.g., Dimension style, Text style, Symbol library, drawing at different scales, composition of drawing at different scales e.g., municipal drawing.

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Second Year B.Arch. Sem-III **Old Syllabus** **Years** (2017-18, 2018-19)

Subject code	**Subject Name**		**Course Objectives and Outcome**
AR03-01	Graphics – III	**CO-1** **CO-2**	The study of this subject is continuation of drafting skills, various techniques of presentation with knowledge of perspective. To enable the students to communicate an architectural idea / proposal in a legible and effective manner through perspective projections, use of shades and shadows, and various architectural presentation and rendering techniques.
AR03-02	Elective – I Art Appreciation	**CO-1** **CO-2**	Architectural discourse will be considered as the intersection of diverse system of representation: buildings, projects, drawings, but also architectural theory and criticism, exhibitions, photographs, professional magazines, and the popular press. The course treats as visual arts not only painting and sculpture, but also photography, cinema, fashion, advertisements, and television.
AR03-03	Architectural Design – III	**CO-1** **CO-2** **CO-3**	To learn and understand progressively complex exercises involving spatial relations in two dimensions, three dimensions and time. To learn Fundamental design skills are taught in the context of the architect's wider responsibilities to society, culture and the environment. The course will stress experimentation while providing an analytical and creative framework to develop an understanding of principles of Design, structure and materials as well as necessary skills in drawing and model-making.
AR03-04	Building Construction & Material – III	**CO-1** **CO-2**	To study and understand, construction materials, methods and the process of translating design ideas into built form.

		CO-3 **CO-4** **CO-5**	To study various types of deep and shallow foundations used in various types of soils for framed construction" To introduce students to medium span timber roofs between 6m to 12m. To understand basic principles of RCC construction To study other components of a building project
AR03-05	Theory of Structure – III	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5**	To learn Theory of simple bending, concept of bending stress, assumptions in theory of simple bending, bending stress formula M/I= E/R=F/Y(derivation), neutral axis, moment of resistance, examples to cover rectangular, angle, channel, tee and I sections. To learn Shear stress in beams, concept of shear stress, theory of shear stress, distribution of shear stress on rectangular section(derivation), only formulas for other shapes (circular, I, T) To understand concept of Deflection of beams, Concept of deflection, limits of deflections, deflection by double integration method To learn to design of simple tension and compression member, use of IS800 and steel table. Composite beam concept, moment of resistance of beams.
AR03-06	History of Architecture -I	**CO-1**	The study of various styles in Architecture mainly in Asian countries i.e. India and Indian subcontinent, East Asia and West Asia, through various ages from prehistoric period to colonial period. The study can actively help in its preservation and evolution in design process.
AR03–07	Climatology & Architecture	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	The study includes climatology pertaining to architectural to planning and energy efficient architecture. To understand climate as a determinant of architectural design and to enable the students to evolve climate responsive design To understand terms like weather and climate and to study various instruments and their different methods to record various environment parameters like wind, temperature, humidity, precipitation etc. To understand the importance of about various environmental issues such as Global Warming, pollution, scarcity of resources etc. Brief study of the various climatic zones and their behaviours, solar radiation budget, global isolation,, macro and micro climate Study of Solar Geometry and Solar loads heliodon and its use, air movements and aspects of ventilation
AR03-08	Building Services – I	**CO-1**	Study the concepts of Drainage systems, layouts, different accessories, pipes, chambers, maintenance of systems etc.
AR03 - 09	Computer Technology In Architecture - III	**CO-1**	To train the students in the techniques of computer skill using different types of soft-wares.

		CO-2 **CO-3** **CO-4**	Different types of styles e.g. dimension style, text, style, symbol library, drawing at different scales, composition of drawing at different scales e.g. municipal drawing (concept of paper space & model space). Introduction to other drafting & presentation soft-wares. Developing skills in non-graphic applications on computer as required for architectural profession and office management such as Word processing, Spreadsheets, Power Point presentation, Databases etc.
AR03–10	Environmental Studies	**CO-1** **CO-2** **CO-3**	To conceive knowledge about Nature of Environmental Studies: Definition, scope and importance. Multi-disciplinary nature of environmental studies Need for public awareness. To study Natural Resources and Associated Problems: a) Forest resources: Use and over- exploitation, deforestation, dams and their effects on forests and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non- renewable energy resources, use of alternate energy sources. Solar energy , Biomass energy, Nuclear energy, e) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. To study Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystem: - a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

		CO-4	To study Biodiversity and its conservation: Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghats a biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man- wildlife conflicts. Endangered and endemic species of India.

Second Year B.Arch. Sem-IV	**Old Syllabus**	**Years** (2017-18, 2018-19)	
Subject code	**Subject Name**		**Course Objectives and Outcome**
AR04-01	Graphics – IV	**CO-1** **CO-2** **CO-3**	To understand visual effects of shades and shadows cast by light rays. To understand complex sciography on buildings through various experimentation with models and light conditions. To learn the techniques of drafting and drawing sciography patterns on plans, elevations and views
AR04-02	Elective – II Art Appreciation	**CO-1** **CO-2** **CO-3**	The course explores the relationships between architectural discourse and the visual arts from the historical to the present. Architectural discourse will be considered as the intersection of diverse systems of representation: buildings, projects, drawings, but also architectural theory and criticism, exhibitions, photographs, professional magazines, and the popular press. The course treats as visual arts not only painting and sculpture, but also photography, cinema, fashion, advertisements, and television.
AR04-03	Architectural Design – IV	**CO-1** **CO-2** **CO-3**	To learn progressively complex exercises involving spatial relations in two dimensions, three dimensions and time. To learn fundamental design skills in the context of the architect's wider responsibilities to society, culture and the environment. The course will stress experimentation while providing an analytical and creative framework to develop an understanding of principles of design, structure and materials as well as necessary skills in drawing and model-making.
AR04-04	Building Construction & Material – IV	**CO-1**	This course introduces students to the art and science of building. Emphasis will be placed on gaining an understanding of construction materials, methods and the process of translating design ideas into built form. Specific topics are introduced each week. These topics are then further, various design strategies, materials, fabrication techniques, and didactic built works are explored. As both qualitative and a basic quantitative understanding of elementary systems are mastered, the curriculum shifts its focus on to increasingly complex systems serving entire buildings. The sequence's last two courses develop an understanding of how technical utilitarian systems are resolved, integrated with other systems.
AR04-05	Theory of Structure – IV	**CO-1** **CO-2** **CO-3**	To learn and understand Columns and Struts. To learn and understand Riveted and welded joints. To learn to design of load bearing (brick and stone) masonry walls and piers (for buildings only)

		CO-4 **CO-5**	To learn and understand importance and applications of soil mechanics, SBC of soil (definition), ISI table for SBC of various types of soils, physical properties of soil. To understand the concept of Masonry retaining walls for water and earth pressure (without surcharge), conditions of stability of retaining walls.
AR04-06	Surveying and Levelling	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6** **CO-7** **CO-8** **CO-9**	Introduction of survey: aims, objects &importance of subject. Introduction to land record survey, index map, top sheets. Chain survey, triangulation & instruments for ranging, offsetting. Calculation of are aby method of triangles, simpon rule, by plan meter, digital plan meter. Introduction to prismatic compass & its uses. (Theoretical importance) Introduction to paintable survey (instruments &methods) Levelling instruments & methods to calculation levels, concept of contours & its uses its characteristics & introduction to theodolite. Uses of photographic surveying & concept of GPS. Introduction to advance instruments like digital plan meter, digital theodolite, automatic level, radiation survey method, environmental survey instruments, digital distance meter, etc. Lineout of simple residential building plan
AR04 – 07	History of Architecture-II	**CO-1**	To learn the study of various styles in Architecture mainly in Asian countries i.e. India and Indian subcontinent, East Asia and West Asia, through various ages from prehistoric period to colonial period. The study can actively help in its preservation and evolution in design process.
AR04– 08	Building Services – II	**CO-1**	Study of different water sources, supply sources.
AR04– 09	Computer Technology in Architecture- IV	**CO-1**	To learn introduction to computational design using a range of techniques from NURBS modelling, simple programming and parametric modelling to basic digital fabrication using different types of soft wares
AR04– 10	Environmental Studies	**CO-1**	Environmental Pollution: Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.

		CO-2 **CO-3**	Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of a individual in prevention of pollution. Social Issues and the Environment: Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products. Environmental Protection: From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights Environmental Protection: From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights.

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First Year B.Arch. Sem-I	**New Syllabus**	**Years** (2019-20,2020-21, 2021-22)		
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC-101	Aesthetics & visual arts – I	**CO-1** **CO-2** **CO-3** **CO-4**	To develop within students' manual presentation skills like, sketching and rendering To understand and relationship of surface from space masses, point, line, light, and shade, aesthetics in motion, sound, touch and smell. To learn Aesthetics as part of mind, with the knowledge of Colour theory, colour circle, various colour schemes and their combinations, general psychological effects of colours. To learn appropriate use of Elements of design such as line, form & shape, colour& texture, patterns etc.	2
PC-102	Graphics – I	**CO-1** **CO-2** **CO-3**	To introduce students to architectural drawing techniques and to the language of graphics, its vocabulary and grammar such as scale, annotations, labelling and dimensioning To enable students to express simple three-dimensional objects and building components through Technical Drawings, using various graphic projection systems such as orthographic, Isometric and Axonometric projections. To introduce various techniques of sketching for recording, studying and communicating objects, buildings and building components	2
PC-103	Architectural Design – I	**CO-1** **CO-2**	To learn to the fundamentals and principles of basic design with proper understanding and to enable students to undertake design by application of basic design principles. To comprehend Design as a creative process of choice making and statement of intent.	10

PC-104	Human Settlement & History of Civilization	**CO-1** **CO-2**	To study the settlement and the History of Civilization from Prehistoric period and ancient civilization. Settlement pattern and architectural built from have the influence of geography, geology, climate, socio-climate and religious aspect of that particular place, which emphasis the context of specific planning and design approach is required. To understand comparative study of various civilizations will give the appropriate guideline for the study of settlement and architecture.	2
BS & AE-105	Building Construction & Material – I	**CO-1** **CO-2** **CO-3** **CO-4**	To help students understand the basic building elements, their function and behaviour under various conditions with specific reference to load bearing construction. To help students to develop a clear understanding of the basic principles of construction and materials suitable for load bearing construction To help students develop and analytical and logical sequence in thinking about structural aspects of architecture. To encourage a mix of classroom and field learning.	3
BS & AE-106	Theory of Structure – I	**CO-1** **CO-2** **CO-3**	To Introduce Applied Mechanics as an important Subject for Architecture. To Understand Different Systems of Forces and their Equilibrium and that a Building is a System of Forces in Equilibrium. To Introduce and Understand Concepts of Support, Support Reactions, Beams, Loads, Bending and Shear.	3
PC -107	Workshop – I	**CO-1** **CO-2**	To understand students about various materials and techniques used in making Architectural models. Enabling Students to make Architectural models for study and presentation.	1
SEC-108	Communication Skills – I	**CO-1** **CO-2**	Introducing various communication skills in the society. To enable Students to make presentation in front of mass communication.	2
SEC-109	Computer Technology in Architecture - I	**CO-1**	To learn to create and organize 2D drawing with all the commands including edit commands.	2

First Year B.Arch. Sem-II			**Years** (2019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC-201	Aesthetics & visual arts – II	**CO-1**	To create awareness about principle of good design to develop good aesthetic taste understand of Architecture and different fine arts and their application to study the principle of architecture, interior design, house design, advertising, city planning. etc	2
PC-202	Graphics – II	**CO-1**	To develop the drawing skills as tools for creative thinking, visualization, perception, imagination and representation of simple architectural shapes, forms and basic elements of building	2
PC-203	Architectural Design – II	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	To introduce the students to the iterative design process and various channels of creativity. To develop representational skills and architectural design principles within students Understanding anthropometry and its architectural design implications Introduce students the various elements of architectural space making To make students explore in design of built form with reference to climate To develop skills within students to develop design proposal in the form of sketches drawings and models	10
PC-204	Human Settlement & History of Civilization	**CO-1**	To study of settlement of development of civilization from medieval period to modern period. Study should emphasize a development phase of civilization with reference to socio-cultural, religion, climate geography and geological aspect. Comparative study of various civilization	2
BS & AE-205	Building Construction & Material – II	**CO-1** **CO-2** **CO-3**	To help students understand the basic building elements, their function and behaviour under various conditions with specific reference to timber construction. To help students to develop a clear understanding of the basic principles of construction and materials suitable for load bearing construction. To help students develop and analytical and logical sequence in thinking about structural aspects of architecture."	3

BS & AE-206	Theory of Structure – II	**CO-1** **CO-2** **CO-3** **CO-4**	To Analyse the forces in a Frame To Study and analyse the stresses in various Building Elements like Columns and Beams To Study the deflection effect of loads on Beams To Study Combined Stresses on Eccentrically Loaded Columns and Apply the Same to the Design of Foundations of Load Bearing Walls."	3
PC -207	Workshop – II	**CO-1** **CO-2** **CO-3**	Introducing students to various materials and techniques used in making Architectural models. Enabling Students to make Architectural models for study and presentation. To introduce computer aided 3D modelling.	1
SEC-208	Communication Skills – II	**CO-1** **CO-2**	Introducing various communication skills in the society. Enabling Students to make presentation in front of mass communication.	2
SEC-209	Computer Technology in Architecture - II	**CO-1**	Different types of styles for e.g., Dimension style, Text style, Symbol library, drawing at different scales, composition of drawing at different scales e.g., municipal drawing.	2

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South Shivaji Nagar, Sangli-Miraj Road, Sangli - 416 416. Ph. (0233) 2320294 / 2322336.
* E-mail : mh24sangli@gmail.com * web : abcasangli.org

Second Year B.Arch. Sem-III			**Years** (2019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC-301	Graphics – III	**CO-1** **CO-2** **CO-3**	The study of this subject is continuation of drafting skills, various techniques of presentation with knowledge of perspective. To learn to communicate an architectural idea / proposal in a legible and effective manner through perspective projections, use of shades and shadows, and various architectural presentation and rendering techniques." To enable to generate simple architectural drawing using CAD	2
PE-302	Elective – I Art Appreciation	**CO-1** **CO-2** **CO-3**	To learn relationships between architectural discourse and the visual arts from the historical Avant-grade to the present. Learn and interpret the intersection of diverse system of representation: buildings, projects, drawings, but also architectural theory and criticism, exhibitions, photographs, professional magazines, and the popular press. Learn painting and sculpture, but also photography, cinema, fashion, advertisements, and television.	2
PC-303	Architectural Design – III	**CO-1** **CO-2** **CO-3** **CO-4**	Learn to comprehend Design as iterative process at various scales/ levels Learn to understand and comprehend relationship between design, visual arts, building construction, climatology, building materials, structure etc and evolve a design solution." To develop Fundamental designs Skills taught in the context of the architect's wider responsibilities to society, culture and the environment. Develop an understanding of principles of design, structure and materials, as well as necessary skills in drawing and model-making	10

BS & AE – 304	Building Construction & Material – III	**CO-1** **CO-2** **CO-3** **CO-4**	To study and understand, construction materials, methods and the process of translating design ideas into built form. To study various types of deep and shallow foundations used in various types of soils for framed construction To introduce students to medium span timber roofs between 6m to 12m. To understand basic principles of RCC construction and other components of a building project.	3
BS & AE-305	Theory of Structure – III	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5**	To understand the concept of Buckling and Crushing in Columns. To understand Fixity at supports and Concept of Continuity over supports and Negative Bending Moments" To understand the principles of Load Bearing Construction, Use of Arches and Lintels. To Study the strength of one Material - Steel and the use of these material as Beams, and Columns or as members of a Truss." To enable to Design by Working Stress Method	3
BS & AE-306	History of Architecture -I	**CO-1** **CO-2**	To study of various styles in Architecture mainly in Asian countries i.e. India and Indian subcontinent, East Asia and West Asia, through various ages from prehistoric period to colonial period. The study can actively help in its preservation and evolution in design process.	2
BS & AE – 307	Climatology & Architecture	**CO-1** **CO-2** **CO-3** **CO-4**	To understand climate as a determinant of architectural design and to enable the students to evolve climate responsive design To understand terms like weather and climate and to study various instruments and their different methods to record various environment parameters like wind, temperature, humidity, precipitation etc. To understand the importance of about various environmental issues such as Global Warming, pollution, scarcity of resources etc. Brief study of the various climatic zones and their behaviours, solar radiation budget, global isolation,, macro and micro climate Study of Solar Geometry and Solar loads heliodon and its use, air movements and aspects of ventilation	2
BS & AE – 308	Building Services – I	**CO-1**	Study the concepts of Drainage systems, layouts, different accessories, pipes, chambers, maintenance of systems etc.	2
BA & AE – 309	Environmental Studies	**CO-1**	To conceive knowledge about Nature of Environmental Studies: Definition, scope and importance multi-disciplinary nature of	2

			environmental studies Need for public awareness.	
		CO-2	To study Natural Resources and Associated Problems: a) Forest resources: Use and over-exploitation, deforestation, dams and their effects on forests and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and non- renewable energy resources, use of alternate energy sources. Solar energy , Biomass energy, Nuclear energy, e) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.	
		CO-3	To study Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystem: - a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	
		CO-4	To study Biodiversity and its conservation: Introduction- Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega- diversity nation. Western Ghats a	

			biodiversity region. Hot-spots of biodiversity. Threats to biodiversity habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India.	

Second Year B.Arch. Sem-IV			**Years** (2019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC-401	Graphics – IV	**CO-1** **CO-2** **CO-3**	To understand visual effects of shades and shadows cast by light rays. To understand complex sciography on buildings through various experimentation with models and light conditions. To learn the techniques of drafting and drawing sciography patterns on plans, elevations and views	2
PE-402	Elective – II Art Appreciation	**CO-1** **CO-2** **CO-3**	To learn to explore the relationships between architectural discourse and the visual arts from the historical avant-garde to the present. To learn the intersection of diverse systems of representation: buildings, projects, drawings, but also architectural theory and criticism, exhibitions, photographs, professional magazines, and the popular press. To learn painting and sculpture, photography, cinema, fashion, advertisements, and television.	2
PC-403	Architectural Design – IV	**CO-1** **CO-2** **CO-3**	To learn progressively complex exercises involving spatial relations in two dimensions, three dimensions and time. To learn fundamental design skills in the context of the architect's wider responsibilities to society, culture and the environment. To develop an understanding of principles of design, structure and materials as well as necessary skills in drawing and model-making.	10
BS & AE – 404	Building Construction & Material – IV	**CO-1**	This course introduces students to the art and science of building. Emphasis will be placed on gaining an understanding of construction materials, methods and the process of translating design ideas into built form. Specific topics are introduced each week. These topics are then further, various design strategies, materials, fabrication techniques, and didactic built works are explored. As both qualitative and a basic quantitative understanding of elementary systems are mastered, the curriculum shifts its focus on to increasingly complex systems serving entire buildings. The sequence's last two courses develop an understanding of how technical utilitarian systems are resolved, integrated with other systems.	3

BS & AE-405	Theory of Structure – IV	**CO-1** **CO-2** **CO-3** **CO-4**	To learn to identify Types of RCC retaining walls, their use and understand the Different types of liquid retaining structures and their structural detailing To learn to design of Steel structure elements by L.S.M To Develop Structural Principles and their Relates to Building Design and To Develop in Students the Concept that "Every Structure is a System that Forms the Space" and the fact that Architecture and Structure cannot be conceived independently To Develop the Mathematical logic that would enable him to Design the Structural System for Ground +2I Storey R.C.C Structure and a medium span Factory Building in steel.	3
BS & AE-406	Surveying and Levelling	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6** **CO-7** **CO-8** **CO-9** **CO-10**	Introduction of survey: aims, objects &importance of subject. Introduction to land record survey, index map, top sheets. Chain survey, triangulation & instruments for ranging, offsetting. Calculation of are aby method of triangles, simpon rule, by plan meter, digital plan meter. Introduction to prismatic compass & its uses. (Theoretical importance) Introduction to paintable survey (instruments &methods) Levelling instruments & methods to calculation levels, concept of contours & its uses its characteristics & introduction to theodolite. Uses of photographic surveying & concept of GPS. Introduction to advance instruments like digital plan meter, digital theodolite, automatic level, radiation survey method, environmental survey instruments, digital distance meter, etc. Lineout of simple residential building plan	2
PC – 407	History of Architecture-II	**CO-1**	Subject includes the study of various styles in Architecture mainly in Asian countries i.e. India and Indian subcontinent, East Asia and West Asia, through various ages from prehistoric period to colonial period. The study can actively help in its preservation and evolution in design process.	2

BS & AE – 408	Building Services – II	**CO-1**	Study of different water sources, supply sources.	2
BA & AE – 409	Environmental Studies	**CO-1** **CO-2** **CO-3**	Environmental Pollution: Definition: Causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of individual in prevention of pollution. Social Issues and the Environment: Disaster management: floods, earthquake, cyclone, tsunami and landslides Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products. Environmental Protection: From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights Environmental Protection: From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights.	2

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* E-mail : mh24sangli@gmail.com * web : abcasangli.org

Third Year B.Arch. Sem-V			**Years** (2019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC- 501	Architectural Design - V	**CO-1** **CO-2** **CO-3**	To understand the socio-cultural aspects on Architectural design. To understand the climatical considerations bearing on Architectural design. To be exposed to suitable building materials and construction technologies to evolve a design solution	10
BS & AE- 502	Building Construction & Material- V	**CO-1** **CO-2** **CO-3** **CO-4**	To introduce structural concepts of various parts of buildings To introduce construction techniques To explain construction details through case studies To explain process of construction and supervision	3
BS & AE – 503	Theory of Structure- V	**CO-1** **CO-2** **CO-3**	To study the use and application of tools and techniques required to study the behaviour of various structural system and feasibility of different structural system. To study limitations of forms, spans and develop knowledge about choice of proper structural material, strength consideration, behaviour and response of loads. To learn and understand the practical difficulties face on site.	3
PC – 504	History of Architecture-III	**CO-1** **CO-2** **CO-3**	To study Architectural development in chronological manner in Europe or western countries. To understand evolution of different architectural solutions through historical periods within the restraints of prevalent social and religious customs, geography, climate, building materials and techniques, aesthetical influences, structural complexities and technology available at the time. To organise such activities which actively help in preservation of rich Architectural Culture in evolution of Design process.	2
PC – 505	Estimation Costing & Specification- II	**CO-1**	To learn the factors that affect the cost of construction.	2

		CO-2 **CO-3** **CO-4**	To understand the concept of rate analysis for various items in building construction. To create ability of taking out of quantities from drawings and to determine estimated cost of building projects as per standard procedures. To inculcate habit of systematic recording of all the statistics concerned to estimating & costing	
BS & AE- 506	Building Services – I	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	To learn Electrical requirements for given situation, its calculations and design. Artificial Illumination and its application in buildings. Overview and introduction to heating, ventilation, and air conditioning focusing on different HVAC systems. Lift, escalator and travelator requirements for given situation Introduction to building's firefighting system, security system and pumps and water. Integrating natural and artificial illumination.	2
PC – 507	Working Drawing – I Arch, Graphics & Drawing	**CO-1**	Learn working drawing for composite construction based on design problem done in second year architecture which should include. R.C.C. framed structure, steel framed structure and load bearing structure.	3
PC – 508	Landscape Architecture Landscape Design	**CO-1**	To understand landscape design as an allied field of architecture; to introduce landscape architecture and the scope of it. It will create awareness regarding the process of landscape design for small and large buildings; Indoor and outdoor spaces.	2

Third Year B.Arch. Sem-VI			**Years** (2019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**	**Credits**
PC- 601	Architectural Design - IV	**CO-1** **CO-2** **CO-3**	To understand the visual interaction between indoor – outdoor spaces and landscape elements. To understand the spatial and structural implications of basic services involved. To be aware of the local building bye laws.	10
BS & AE- 602	Building Construction & Material- IV	**CO-1** **CO-2** **CO-3**	To learn structural concepts of various parts of buildings To learn construction techniques To understand construction details through case studies and to learn process of construction and supervision	3
BS & AE – 603	Theory of Structure- IV	**CO-1** **CO-2**	To learn and to understand the behaviour of RCC Structural systems, feasibility of different structure systems, limitation of forms, spans, choice of proper structural section, strength consideration, behaviour, and response of loads. To learn to select proper structural section with concept of factor of safety, characteristic strength of material.	3
PC – 604	History of Architecture-IV	**CO-1** **CO-2**	To study of various styles in Architecture mainly of Europe, America and India through various ages of Renaissance, Gothic, Industrial revolution and Modern period. To learn the evolution of different architectural solutions through historical periods within the restraints of prevalent social and religious customs, geography, climate, building materials and techniques, aesthetical influences, structural complexities and technology available at the time. More emphasis is given to know the evolution of architecture in India after Independence. The study shall actively help students in preservation of rich Architectural Culture in evolution of Design process.	2
PC – 605	Estimation Costing & Specification- III	**CO-1** **CO-2** **CO-3** **CO-4**	To learn the factors that affect the cost of construction. To understand the concept of rate analysis for various items in building construction. To create ability of taking out of quantities from drawings and to determine estimated cost of building projects as per standard procedures. To inculcate habit of systematic recording of all the statistics concerned to estimating & costing	2

BS & AE- 606	Building Services – IV	**CO-1**	To understand and apply in design knowledge about: Hot water supply design in hospitals and hotels, Hospital services like CSSD, hospital gases and incinerators, Community kitchens, laundry and housekeeping services, Swimming pools, Sustainable Services for hospitals and hotels, Solar electrical panels for electricity generation, Water treatment plant for hospitals and hotels. (STP / ETP).	2
PC– 607	Working Drawing – II Arch, Graphics & Drawing	**CO-1**	Working drawing for composite construction based on design problem done in second year architecture which should include, R.C.C. framed structure, steel framed structure and load bearing structure.	3
PE– 608	Interior Design	**CO-1** **CO-2** **CO-3**	To learn to comprehend relationship between Architecture and Interior Design as a Space making disciplines. To learn to evolve understanding about thoughtful design of interior spaces & how it can increase efficiency and add depth and meaning to the built environment. To learn and comprehend the connection that the subject of Interior design has with other Design Disciplines like Conservation, Preservation, Restoration, Sustainability, Art, Product design and Graphic design, Basics of interior design such as interior spaces, its types and various components, treatments, finishes, etc. Indoor lighting, furniture design materials selection for different environments.	2
BS & AE - 609	Architectural Acoustics	**CO-1** **CO-2**	To learn, understand and apply: Basic laws and terminologies related to Acoustics, Acoustical requirements of a given activity, its calculations and designing of the space. Urban noise control and its application at site and building level.	3

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Fourth Year B.Arch. Sem-VII	**Years** (2017-18, 2018-192019-20,2020-21, 2021-22)		
Subject code	**Subject Name**		**Course Objectives and Outcome**
AR07-01	Environmental Design-I	**CO-1** **CO-2**	To the study of built-up spaces and negative spaces, natural environment and built-up environment, aesthetics of spaces in groups of buildings, layout and planning of large areas and campuses. To study and understand elements of town planning, Urban design and landscape architecture.
AR07-02	Adv. Arch. Design-I	**CO-1** **CO-2** **CO-3** **CO-4**	To learn to deal with large scale Architectural building projects with emphasis on building services & systems, architectural controls & building bye laws. Understanding typologies of Architectural Design projects in Urban area. Understanding various architectural services such as sewage & sullage disposal, water supply, Electricity, Air-conditioning & firefighting related to the interior layout of the concerned building. Understanding of services shall be reflected in drainage layout, layout of water supply, Electrical layout, layout of air-conditioning & layout for firefighting of the concerned design.
AR07-03	Adv. Services-I	**CO-1** **CO-2**	Understand the advanced structural systems, materials and services required in buildings with complex and special requirements and learn to integrate the same in design. Sewage disposal system for housing colony. 1.Small and medium sized project: for smaller and bigger towns and in rural areas. 2. Sewage treatment plants, different types. 3. Bye products. 4. Gas plant and distribution. 5. Connections of large complexes to Municipal sewers and ventilation of sewers to public sewerage system. 6. Introductory concepts of special types of waste, their treatment and disposal. 7. Drainage systems and problems of multi-storeyed buildings. 8. Basic principles of water purification system (Introductory only) plants, water treatment,

		CO-3	f1lterationswimming pools, water distribution and central stations. Water Supply, distribution for single and multi-storeyed' buildings and industrial projects. Water bye principles and implementations. Standard for hard soft: and potable water, standards for different users Sources of water supply. Design problems based on water supply and drainage for multi-storeyed building and a small colony. Refuse disposal system 1. Refuse disposal system for a small house, colony and town. Refuse types, and disposal problems. 2. Refuse incinerator methods. 3. Methods of Dry disposal, wet refuse treatment. 4. Industrial refuses disposal, problems and systems. 5. Utilization of farm refuse. 6. Refuse disposal in multi-storeyed buildings. 7. Refuse and environmental pollution problems.
AR07-04	Adv. Structure-I	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6** **CO-7**	To study about foundation and types of foundation as per the strata and types of foundation. To study and understand types of slabs and uses. To study types of stairs and the elements and detailing of the elements and Structural behaviour and reinforcement detailing of following types of slabs. Elements, structural behaviour & reinforcement details of a) Cantilever retaining wall b) Counter fort/ Buttress type retaining wall Advantages and disadvantages To study concrete mix design parameters for mix design, Water cement ratio, Test for wet & hardened concrete. To study water tanks and structural behaviour and reinforcement detailing of following types Underground (UG), resting on ground, elevated service reservoir (ESR) Shape in plan square, rectangular, circular, advantage and disadvantages Aesthetical form of E.S.R. To study Construction Methodology of 1) Precast Concrete elements- advantages & disadvantages 2) Prefabricated steel works- advantages & disadvantages 3) Prestressed concrete structure- Concept, Pre-tensioning & post tensioning, advantages & disadvantages.
AR07-05	Urban & regional planning	**CO-1** **CO-2** **CO-3**	To learn all the facts for environmental and city planning, the process of town planning factors affecting city planning and procedures involved, to understand bow farsighted city planning will meet present as well as future social, cultural and economical requirements To understand Town Planning principles which have evolved through ages. Evolution of Town Planning thought with special reference to India. Objects of planning, human settlements, Town Planning as an inter-disciplinary process, Contemporary planning concepts, Geddes, Howard, Doxiadis, Perry; Le Corbusier etc. Regional Plans, Development Plans, Urban and Rural Housing Programmes, Legislative, Administrative and "fiscal measures, Zoning and other regulations. To learn Land-use maps topography, influences of climate on town planning. Infrastructure in city planning

		CO-4	traffic census, classification of roads, road layouts, widths, junctions, flyover bridges, and various road patterns for vehicles and pedestrian traffic. To understand M. R. T.P. Act, 1966 and Town Planning Act, 1954. Planning for villages and Rural areas.
AR07-06	Adv. Building Specification and valuation	**CO-1** **CO-2**	Learn Importance of specification in building construction, Method of writing in correct order & sequence, use of Indian Standard & "RED BOOK" in drafting specification. Specification for basic materials like Brick Sand, Cement, Coarse Aggregate, stone, water etc., fixtures and fastening Specification for construction items like excavation, PCC, RCC works, Brick & stone masonry, Plastering and finishing, Doors And Windows, Rolling shutter, roofing materials Learn Valuation: Definitions of value, cost, price, Importance of valuation, Different types of values, Factors affecting value , Different purposes of valuation, Gross income, outgoings and Net Income, different outgoings Different methods of valuation for land and building Application of valuation tables Valuation Questionnaire Valuation of Commercial Buildings like hostels, Lodges, theatres etc.

Fourth Year B.Arch. Sem-VIII		**Years** (2017-18, 2018-192019-20,2020-21, 2021-22)	
Subject code	**Subject Name**		**Course Objectives and Outcome**
AR08-01	Environmental Design-II	**CO-1**	To study and understand i) Correlations of F.S. I. Ground coverage, floor heights. ii) Co-relation of positive and negative spaces, aesthetics of spaces in groups of buildings, Block model making. . iii) Delineation of Architectural character. iv) Urban Renewal, conservation, design in relationship with historic buildings. Elements of Landscape Architecture: i) Materials-hard and soft, textures, shapes-uses. ii) Types of trees and other landscape elements, their uses in landscape arch. iii) Relationship between built up and natural environment. iv) Integration of buildings and landscape, design of open spaces inside and outside buildings. v) Design of street furniture and signage.
AR08-02	Adv. Arch. Design-II	**CO-1** **CO-2** **CO-3** **CO-4**	To analysis, planning, design with the understanding of a wide range of related issues in urban & rural context. To understand design of complex buildings & campuses involving analytical study of building spaces with consideration of sociological, economical, cultural & climatic factors. To understand application of technology, design of structure involving services & interior & landscape design of the concerned project. To study urban structures, urban continuity, movement structure, landscaping, people & vehicular movement's system design, economics, Architectural aesthetics & details.
AR08-03	Professional Practice and Building Bye-laws	**CO-1**	To learn to embark on his professional career in any capacity, to practice his profession efficiently and to know bye-laws and regulation of various public authorities.
AR08-04	Adv. Structure-II	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	To study concept & structural behaviour of Industrial Building with different construction materials and methods To study and analyse earthquake resistant structures in detail. To study applications of computers in structure with introduction to analysis of building, Introduction of different software's used in analysis of structure. To study and understand rigid and hinged portal frames in RCC & steel structure To study concept & detailing of multi-storeyed load, bearing non load bearing structure Introduction of folded plate, geodesic dome, hyperboloids, paraboloids, Concept of space frames.
AR08-05	Urban Design	**CO-1** **CO-2** **CO-3**	To study definitions of urban planning, urban design and architecture. Urban morphology, public realm, urban pattern, grain, texture. Land use, Scale of urban design, heritage of urban design, Elements of urban design – image of the city.

		CO-4	Principles of urban design. Building bye- laws and zoning regulations
AR08-06	Arch. Project-I (Synopsis, Literature Review)	**CO-1**	The work should include intensive investigation and research on social and economic aspects project needs, climatology, Design project may be based on development schemes, or redevelopment schemes of complexes in town centres, Education, Industrial, Recreation, Commercial or residential use involving problems in traffic movement of vehicles and People, giving layouts. Landscaping, model and concise written report clearly outlining the concept and evolution of design. The final solution will be a complete design drafted on cartridge of tracing paper model, perspective etc. as much as to explain the scheme in its totality.

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Fifth Year B.Arch. Sem-IX **Years** (2017-18, 2018-192019-20,2020-21, 2021-22)			
SR. No	**Subject Name**		**Course Objectives and Outcome**
1.	Practical Training and Report	**CO-1** **CO-2**	To learn and complete practical training under a registered architect in Private Office/ Corporate office/ Government Organizations etc with the permission and approval of the Principal/ HOD / Director of the college. The period of practical training shall be of two semesters To learn: • Day-to – day working of an Architect's Office and Correspondence. • Presentation techniques. • Working Drawings and detailed drawings. • Preparing estimates, checking of contractor's bills. • Site Visit for Supervision of the work. • Item rates, labour rates and cost of standard materials available in the market.
2.	Arch. Project-II (Data collection, Case studies, Site analysis, Design Programme)	**CO-1** **CO-2** **CO-3** **CO-4**	To learn and understand: 1. Data Collection: Necessary information, interviews, surveys, experimental work, discussion to be done concerned to their thesis topic. 2. Case Studies: Two no. Live case studies Minimum one no. book case study Minimum one no. Net case study with comparative analysis and statement 3. Design Program and Requirements: Students should finalize design program and requirements under the supervision of internal and external guide. Students should also take cognizance of different institutional authorities (COA, AICTE, UGC, MHRD, Medical council, Department of Govt. of India, etc.) to finalize their design program. 4. Site Analysis: Students should finalize the site and location under the supervision of guide with reference to requirements of above different institutional authorities.

Fifth Year B.Arch. Sem-X **Years** (2017-18, 2018-192019-20,2020-21, 2021-22)			
SR. No	**Subject Name**		**Course Objectives and Outcome**
1.	Arch. Project III (Final Design and Presentation drawings /report)	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5**	1. Analysis & Conclusion 2. Decision of approach to Final Design –concept & zoning etc. 3. Draft Design submission –Includes single line conceptual plans 4. Detailed layout plan showing building footprints, roadways, parking, service line, ETP/STP, Landscaping etc. Learn and prepare technical drawings including plans, elevations, Sections, interior & Exterior Views, model, construction techniques applied, security systems etc. with typewritten bound report and drawing
2.	Adv. Building Construction & Materials	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6** **CO-7** **CO-8** **CO-9** **C-10** **CO-11** **CO-12**	1. PAINT AND VARNISHES: Different types of paints and varnishes, their composition, manufacture, properties, application and uses. 2. FALSE CEILING: T. W. Aluminium. steel framing materials, covering materials, like asbestos, soft boards, acoustical boards, plaster of Paris etc. 3. THERMAL AND SOUND INSULATING MATERIALS Composition, properties and application. 4. MASTIC SEALENTS AND ADHESIVES: Various types, their compositions, properties and application. 5. Epoxy materials and their varied uses in construction. 6. Fire proofing and retarding. Constructional measures adopted for fire resisting and fire retarding structures. 7. Market survey and study of new products. 8. FOUNDATION: Construction aspects and details of raft: foundation, details of hinged joints in footing in R. C. C. and steel. Details of basement construction with waterproofing and details of ventilation in - (a) Masonry (b) R. C. C. *Dewatering of basements, sheet piles. *Equipment and machinery for different types of foundations. *Methods of water proofing for basements and swimming pools. Tanking. 9. SUPERSTRUCTURE: 10. BANKVAULTS: 11. DEMOLITION OF STRUCTURES Timber frame structures, load bearing structures, steel structures. R. C. C. structures. Addition alterations to old buildings. 1. Strutting 2. Underpinning 3. Thickening of walls. This subject should be dealt with keeping in mind the fact that construction is a Process and understanding the process should be given importance. Site visit should be conducted for better understanding of construction process. 1be different situations call for different construction methods, techniques, these methods have certain limitation, and architectural advantages. 12. Earthquake resistant structures. * Fire escapes, constructional aspects of lifts and escalators. * Auto

		CO-13	sliding doors, fire resistant doors, remote control doors. * Steel columns for factory buildings. ROOFING: Constructional aspects of portal frames, in R.C.C .and steel base and apex joints. girders, precast beams, slabs, lifting in position, securing ends, prestressing of beams, geodesic domes, new methods by C. B. R. I. and N.B.O. only Architectural profits and sections without reinforcement details to understand the principles and geometric forms of1. Shale Roofs 2. Space structure 3. Pneumatic structures 4. Tensile structures 5. Trussed roof with boas. Gantry girders, chemical tanks, grain go downs, cold storages, poultry farms, chimney construction, earthquake resistant structures.
3.	Elective-I Architectural Conservation	**CO-1** **CO-2** **CO-3** **CO-4**	Introduction to architectural conservation of Housing includes - definition, nature, purpose and scope. Issues regarding values in conservation; Ethics of conservation building legislation regarding Conservation Preparatory procedure for conservation Inventories, Inspection, documentation; degree of intervention for prevention of deterioration, prevention of existing state, consolidation of the fabric, restoration, rehabilitation, reproduction, reconstruction etc. Structural aspects of building to study structural elements such as beams, arches and domes; thumbs and walls, piers and columns, foundation of the building etc. Causes of decay in buildings by natural and human factors, Disasters, Botanical, Biological and Microbiological causes. Conservation procedure – the work of conservation Architect and his team of co-workers: inspection documentation and reports, Research, analysis, Preventive maintenance, fire and security, cost control, special skills in arts and crafts
4.	Disaster management	**CO-1** **CO-2** **CO-3**	Definition - Disaster, Mitigation, Management, Preparedness, Vulnerability, Rehabilitation Types of Natural and man-made hazards Environmental Planning & Disaster Management: Study of history, physical, geological and hydro-geological characteristics, vegetation, demography & built structures; carrying capacity, ecological footprint & parasitism. Some important past disasters Authorities, NGOs in mitigation and management I.S. codes, local bye-laws and national Building code. Site planning, building forms and Architectural Design Structural Detailing Disaster management cycle To prepare Case study and report writing Site visit to any disaster mitigation layout for public building/institutional buildings/national important structures
5.	Building Economics and Sociology	**CO-1**	Elements of economics, production of goods, Distribution of wealth, Unemployment Labour and its efficiency, Labour Laws, Economics of buildings contracting. Capital and return from projects like

			Residential properties, offices, cinemas, hotels, etc. Relation between initial and recurring expenditure in building costs. Low-cost housing, Examples illustrating the economics of building projects undertaken by private and Semi-public organisations.
6.	Industrial Architecture	**CO-1**	Site survey and selection for single and group of Industries. Layouts of Industrial complexes, Industrial Estates, etc. Developing master plans for these. Transport and infrastructure facilities. Classification of Industries, Engineering and Processing Industries, Major, allied and small-scale industries. Air pollution and environmental control. Services in industries –Water supply and sanitation. Effluent disposal, Electricity and Industrial Lighting Communication, material and product handling cranes and equipment. Fire protection systems and fire insurance of buildings. Layout of factory and detailed working drawings of a typical factory building with machinery layout. Bye-laws and development control rules of state Industrial Estates, and Cooperative estates. Control of Inspector of factories pertaining to factory buildings, factory Act and Rules, Common amenities and facilities to be provided to the workers under factory Act. Building materials for factory buildings, fabrication, modem construction techniques, expansion, Industrial colonies, social and recreational facilities.
7.	Sustainable Architecture	**CO-1** **CO-2** **CO-3** **CO-4** **CO-5** **CO-6**	Introduction to sustainable architecture: Definition of sustainable architecture, Need, scope &study of , Natural resources & their interrelationship Historical Perspective: Natural & Physiological factors influencing human civilizations & Settlements Challenge of Sustainable Development: Introduction to sustainability, its historical precedence global & local relevance - its correlation to population growth & consumption patterns Human Impact on Earth sustainability: Impact of human civilization on the earth's major ecosystem forests, oceans, & atmosphere; Strategies for Sustainability: Principles of conservation & efficiency as applied to space, energy and material resources; Global treaties & action plans; sustainable role models such as eco-villages; environmental education Sustainability applications to Architecture and Planning: Sustainable Architecture and Planning. Preserving and improving the human settlement in harmony with nature. Conservation of natural resource for improving the quality of life on earth and attempting to ensure its continuity for the future of humanity. Eco cities, eco-communities and eco buildings: Archaeology. Designing settlements and other man-made eco-systems. Ecological and environmental cities for sustainable future

		CO-7	Use of sustainable materials in interiors, green materials and construction technology: Insulation, paint, wiring; Smart building systems Technical Standards & Certifications systems: Types of certification systems worldwide – LEEDS, BREEAM, ECOTEL, GREEN GLOBE, ENERGY STAR etc.
8.	Elective-II Digital Architecture	**CO-1** **CO-2**	Auto Architect or Equivalent Software - Setup, creating drawing / project - Editing a drawing, - Modification and Data Extraction – Outputs 3D Studio - Creating objects- 2 D lofter and 3d Sheper - Modification of objects I material - Surfaces and material Application - Cameras and lights - create and modify - Rendering - Animation - Key framer - Coral draw: - DTP Function -Presentation, rendering - Introduction to Fox pro. - Application to data extraction. - Sessional work based on above topics.
9.	Vernacular Architecture	**CO-1** **CO-2** **CO-3**	Introduction to Vernacular architecture it's nature, purpose and scope. Analytical review classification, salient features and important contributions in evolving workable solutions. Study of examples of Vernacular architecture in history of world architecture (outside Indian subcontinent) to understand evolution of building forms based on functions, building materials and construction techniques, art & crafts, the local conditions, traditions, climate &geography, religion & culture in the period when they were built Case studies of works of architects in contemporary World architecture (outside Indian subcontinent) Introduction to Vernacular in history of architecture in Indian subcontinent. Introduction to Vernacular architecture it's nature, purpose and scope. Analytical review classification, salient features and important contributions in evolving workable solutions.
10	Contemporary Architecture	**CO-1** **CO-2** **CO-3**	Background electric factors -based on Greek, Roman, Gothic models, ornamentation and their adoption in modern architecture validity of such ornamentation. Industrial Revolution, New materials steel concrete, revolution in their techniques and adoption in building technology, new socio-economic views, speed, standardization large scales, etc. Study of various art movements in various fields (Painting, sculpture, theatre, architecture) their interrelationships and Impact on each other, study of Art Noveau, its rise and fall. Their significance and impact on the three modern masters -Frank Llyod Wright, Le Corbusier and Mies Vander, Rohe, Their values and concepts, the new generation of Architectural projects. Neo Classicism: Early projects of adopt Loos, Richardson, Sohinkel, Constructivism: Naum Gabo,Cor Ven Eastener, Malevich. The Chicago School: Richerdson, Sullivan, Adler. Expressionism: Behrens, Van Der Rohe,

			Corbusier, Antonio Gaudi Futurism: Sand Elia, Marianetti, mainly with urban form. Functionalism: Brue and others. Fundamentalism Objective architecture, less is More -Mies Van Der Rohe - God is in detail. Bahaus : The industrial athic –Technique & Ligic, Later, the Harvard School of Thought, Paul Klede, Harbet Bayer Organic Architecture: F. L .Wright, Van Der Velde, Brutalism : Peter &Alison Smithson, Paul Rudolph. Purism: Corbusier, Ozenfant, Metabolism in. Architecture: The highly adaptive, Manipulative, Changing high Tech. Style-kurokawa, Thnge. The plug in, bio-morphic,incremental architecture: Archigram Group, Yona Friendman &others. The cybernatic, automated, semi logical school of thought, The unself conscious, vernacular, & holistic school of thought. Structuralism: Nervi, Candela, Buckminster Fuller. Post Modern classicism: Revival of old classical values of Greeco Roman Architecture. . Architecture &philosophical studies of louis Kahn, Buckminister Fuller, paul Rudolph, Ero & Eliel Saarinen, Philip Johnson, I. M. Pie, James Sterling, Charles Moore, Charles Correa, A P. Kanvinde, B. V. Doshi & others.
11.	Project Management	**CO-1** **CO-2** **CO-3** **CO-4**	Fundamentals of project management, Planning, (Programming), Scheduling (Work break down & time Schedule), Controlling and reviewing. Traditional management, Bar/ Gnatt's Chart, Load chart Merits and demerits of Gnatt Chart. Introduction to modern management system concept, Introduction to Critical path method Network, Concept of event, activity, time estimates, float and slack Introduction to Programme Evaluation Review technique, various time estimates, Difference between CPM & PERT technique, Site Layout for construction Works, Site office & management Application of Computers in Project management for calculation of material requirement and labour requirement Using Abstract Sheet of typical project