



**K.R. MANGALAM UNIVERSITY**  
**THE COMPLETE WORLD OF EDUCATION**

**School of Architecture  
& Planning**

**Student Handbook  
For**

**Bachelor of Architecture  
2019–20**

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## 1. Introduction

The K.R. Mangalam Group has made a name for itself in the field of education. Over a period of time, the various educational entities of the group have converged into a fully functional corporate academy. Resources at KRM have been continuously upgraded to optimize opportunities for the students. Our students are groomed in a truly inter-disciplinary environment where in they develop integrative skills through interaction with students from engineering, social sciences, management and other study streams.

The K.R. Mangalam story goes back to the chain of schools that offered an alternative option of world-class education, pitching itself against the established elite schools, which had enjoyed a position of monopoly till then. Having blazed a new trail in school education the focus of the group was aimed at higher education. With the mushrooming of institutions of Higher Education in the National Capital Region, the university considered it very important that students take informed decisions and pursue career objectives in an institution, where the concept of education has evolved as a natural process.

K.R. Mangalam University is established under the Haryana Private University Act 2006, received the approval of Haryana Legislature vide Amendment Act # 36 of 2013 and consent of the Hon'ble Governor of Haryana on 11th April 2013, which was published in the Gazette notification vide Leg. No.10/2013, dated 3rd May 2013.

### K. R. Mangalam University Is Unique Because of Its

- i. Enduring legacy of providing education to high achievers who demonstrate leadership in diverse fields.
- ii. Protective and nurturing environment for teaching, research, creativity, scholarship, social and economic justice.

### Objectives

- i. To impart undergraduate, post graduate and doctoral education in identified areas of higher education.
- ii. To undertake research programmes with industrial interface.
- iii. To integrate its growth with the global needs and expectations of the major stake holders through teaching, research, exchange & collaborative programmes with foreign, Indian Universities/Institutions and MNCs.
- iv. To act as a nodal center for transfer of technology to the industry.
- v. To provide job oriented professional education to the Indian student community with particular focus on Haryana.

## 2. School of Architecture & Planning

School of Architecture & Planning offers, Council of Architecture (COA) approved, Five years B.Arch. Programme. This Programme has the distinct objective of equipping the students with knowledge, skills and attitude so as to make them capable of successfully meeting the present requirements and future challenges in the profession of Architecture. The course intends to impart intensive knowledge and training in subjects related to Architecture, reinforced with an overall perception towards the entire field of Human Habitat. This approach sensitizes the students to wider perspectives from an Architectural as well as Habitat point of view.

### 3. The B.Arch. Programme

#### (Approved by Council of Architecture, India)

Architecture is a challenging field that involves merging & intermingling to the skills of art and science. This programme is designed to attain a high level of contextual excellence in the arena of architectural design. Theory, Studio & Applied subjects are undertaken in the course structure of

this programme; with crucial inputs by experts in the field of Art, Architecture, Planning, Engineering and Technology. At the end of the Programme, the students graduate with a strong foundation of multi-disciplinary skills related to environment friendly and sustainable design, construction techniques, space transformations and aesthetical features.

**Eligibility Criteria:** Only candidates who have the following credentials shall be eligible for admission to B.Arch. Course .

- (i) Qualified recognized aptitude test in Architecture (NATA Or equivalent ) in 2018.
- (ii) Have Gone through any of the following curriculum with Marks as prescribed below:
  - (a) 10+2 or equivalent examination of central/State Govts. with 50% aggregate marks and with Mathematics as compulsory subject of examination ; or
  - (b) 10+3 Diploma (any stream )recognized by Central /State Govts. with 50% aggregate marks with Mathematics as a compulsory subject of examination ;or
  - (c) International Baccalaureate Diploma passed /appearing, after 10 years of Schooling with 50% marks in aggregate and with Mathematics as compulsory subject of examination.

No direct lateral admission is allowed at any other year /stage of B.Arch .course based on any qualification.

**4. Career Options:** Opportunities exist in both public & private sector, in the field of Architecture & Building construction industry. Independent professional practice is also one option in this field.

**5. Programme Duration:** The Minimum duration for the completion of B.Arch. Programme offered by the university is 5 years. i.e. 10 semesters

As per COA directives & regulations this programme shall comprise of two stages: Stage-I (First 3 years) & Stage-II (Fourth & Fifth Year).

The candidates admitted to the programme shall have to complete the first stage within five years of admission to the programme. However the maximum time allotted to complete both the Stages (I +II) is 8 years.

**6. Class Timings:** The classes will be held from Monday to Friday from 9.10 am to 4.10 pm.

**7. Programme scheme:** - For Programme scheme see **Annexure A**.

## Syllabi

The syllabi of all courses for first year for B.Arch. program offered by SOAP are given in the following pages. These are arranged in numeric order of the last three digits of the course code. For each course, the first line contains; Course Code, Title and credits (C) of the course. This is followed by the course objectives, syllabus (Unit I to IV), Text book and reference books.

**APAR117A**

**BASIC DESIGN & CREATIVE WORKSHOP**

**CREDITS-10**

### OVERVIEW:

Basic Design provides the framework for understanding design as a new language by sensitizing students to the conceptual, visual and perceptual issues involved in the design process. The Course sensitizes to the principles of design and design elements. Exercises complement the theories of design and ensure that the students learn to develop a series of compositions in two and three dimension.

### OBJECTIVES & EXPECTED OUTCOMES:

Introduction to design: Meaning of design, Importance of design, Design in everyday life, Appreciation of Design in nature.

Exercises in terms of sketching of objects available in nature and surroundings.

Elements of design: Fundamental elements of design and their definitions-point, line, shape, form, space, texture, value and colour.

Forms (2D&3D) created through points (segments), lines (columns) and planes (volumes), and combination thereof; using various techniques & materials like Paper, Card board, Mount board, Thermocol, Styrofoam, Softwood, Acrylic sheets, wires etc.

Principles of Design: Introduction to the principles, of design-unity, balance, symmetry proportion, scale, hierarchy, rhythm, contrast, harmony, focus etc. use of grids, creating repetitive patterns.

Theoretical inputs to be followed by exercises to develop the ability to translate abstract forms in 2D & 3D into compositions depicting various principles of design.

Organic Designs: Appreciation of design through various organic forms in nature & various design principles they exhibit.

Introduction to Bio-mimicry: To be followed by exercises to create organic forms using clay, Plaster of Paris, Metal scrap, Jute fiber etc.

**The subject sensitizes the students about basics of design with the help of observation; sketching and model making. These exercises will help the students to express their ideas on paper. Also, the exercises based on elements of design its principles and bio mimicry will enable students to understand the core of design and processes in nature and surrounding, through which a design can be developed and utilized further.**

**APAR118A**

**ARCHITECTURAL DESIGN-I**

**CREDITS-6**

**OVERVIEW:**

Introduction to basics of design to understand form and space in architecture. Sensitizing students to be more observant to their surroundings and promoting it as a basic creative instinct in the students.

**OBJECTIVES & EXPECTED OUTCOMES:**

Study of Anthropometrics: Studies and introduction to human dimensions and functions, space-activity, relationships, measured drawings of simple living units.

This can be best understood through one or two short exercises in anthropometrics. Presentations should be made through simple sketches and drawings.

Short exercises in design and layout of personal space for living, eating, sleeping, cooking, toilets, laundry area, outdoor sitting spaces such as verandah, balcony etc.

Scale in Architecture: Exercises to increase perception and sensitivity of the students about space in terms of balance & proportions.

Simple measurement exercises, with & without proper measuring instruments, so that before the students start doing building design proposals, they have to have a fair and almost accurate idea about sizes & measurements of some typical requirements of architecture & design in everyday life.

Measuring drawing & dimensioning of simple building components.

Design of mono-cellular-units/structures on a level plane Design of simple single activity units such as milk booth, tea stall, shelter in park, bus stop or designing of student's own room (as a student of architecture).

Design of multiple but simple activity spaces involving primarily horizontal circulation.

Exercise to emphasize the significance of the user in the process of design.

The design of building unit to be completed in the following stages: Prototype study, Problem identification, Site analysis, Preliminary sketch etc. Models to be developed of final designs.

**Suggested exercises: Residence, Guest House, Dharamshala, etc.**

**The course intends the students to understand architectural design as a process and as a final product; to understand fundamentals of space, form and order as basic architectural skills. To involve students in a design project that will involve simple space planning and the understanding of the functional aspects of good design; to enable the students apply theoretical knowledge learnt in the previous semester in architectural design exercise.**

**The Students are expected to develop a series of abstract models that demonstrate some of the essential spatial/ programmatic characteristics of the project. Activities of the graphic design studio and architectural workshop are to be synchronized with the studio exercise.**

**APAR119A**

**BUILDING CONSTRUCTION & MATERIALS-I**

**CREDITS-5**

### **OVERVIEW:**

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them. The emphasis is on familiarization by direct handling and observation. Students shall be encouraged to acquire a taste for good workmanship and quality products. The course is visualized as having three essential components viz. a lecture course in materials and methods of construction, a construction studio wherein principles and practices shall be applied to the production of meaningful working details and drawings and a building workshop to be conducted either in the construction field in the school premises or at specific venues outside incorporating a first-hand experience of important stages of building construction, to complement the studio work. The construction studio will be integrated with the Architectural design studio wherever possible.

### **OBJECTIVE AND EXPECTED OUTCOME:**

To introduce the students into architectural aspects of building construction.

Materials:

Basic Building Materials:

Brick- Constituents and properties of Soil, Manufacturing, Types, Sizes, Properties and Uses.

Stone- Process of Rock Formation, Various Kinds of Stones used for Building Construction, their properties applications etc.

Lime, Cement, Sand

Communication through Drawings:

Brick cuts- Bricks, Bats and Closers

Brick Bonding: Types of Bonds- Header, Stretcher, English, Flemish, Rat-Trap Bond.

Brick Masonry- L, T, Cross junction and Jamb Detail for various thicknesses, e.g.  $\frac{1}{2}$ , 1, 1  $\frac{1}{2}$  Thick Brick Wall.

Stone Masonry of various types- Rubble, Ashlar etc.

Introduction to Lintels, Arches, Corbeling, Window Sills and their methods of construction.

Building Components- wall, floor, roof and foundation; construction terminology through typical section

**The students will have a clear understanding of materials & constructional details of conventional wooden brick & stone masonry through workshop practice and manifest them into drawings.**

**OVERVIEW:**

This course is designed to expose students to the process of building construction, the components of buildings and the materials, skills and equipment used in shaping them. The emphasis is on familiarization by direct handling and observation. Students shall be encouraged to acquire a taste for good workmanship and quality products. The course is visualized as having three essential components viz. a lecture course in materials and methods of construction, a construction studio wherein principles and practices shall be applied to the production of meaningful working details and drawings and a building workshop to be conducted either in the construction field in the school premises or at specific venues outside incorporating a first-hand experience of important stages of building construction, to complement the studio work. The construction studio will be integrated with the Architectural design studio wherever possible.

**OBJECTIVE AND EXPECTED OUTCOME:**

Understanding application of timber through its processing and execution.

**Materials:**

Timber: Variety of Indian Timbers, Characteristics and Suitability for different uses, defects and decay, seasoning and Preservation, Manufacture Timber Products and their applications.

Hardware used for Wooden Doors and Windows, Types of Floor Finishes.

**Communication through Drawings:**

Introduction to joinery in Timber- Workshop practice for Carpentry Joints

Types of Wooden Doors- Battened Lugged Braced Door, Flush Door, Panel Door etc.

Types of Wooden Windows- Casement Windows etc.

Various Sloping Roof in timber, e.g. Lean to roof etc., King-Post Truss and Queen-Post Truss

**Students will acquire the knowledge about primary construction materials such as Bricks, stone & wood. Through experiential learning and participatory learning methods students will get hands on experience of using these materials in varied construction techniques.**

**OVERVIEW:**

History of Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present

e.g the journey of the dome in the Indian context. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.

The History of Architecture is studied over 5 semesters and is divided chronologically and regionally to understand and focus on a specific aspect in a particular semester.

**OBJECTIVES AND EXPECTED OUTCOMES:**

The course shall include sketching and understanding of historical buildings, historical analyses, measured drawings and visit to places of historical importance.

This course marks the beginning of the journey and explores the earliest settlements and

civilizations. Evolution of civilizations across the world as a solution to the needs or demands of the prevalent conditions is studied. Beginning with Stone Age and primitive civilizations, the course covers Stonehenge, Carnac, Bhimbetka, Jericho, Catahuyuk and Hattasus, Indus Valley, Mesopotamia, Egypt, Greek and Roman civilizations.

**The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation. The students will generate an understanding about the development and evolution of architecture as a culmination of various factors. The students are introduced to a chronological study of world architecture starting with development of civilizations in context of location, climate, socio-cultural, historical, economic and political influences. The students understand the building types and development of architectural form and character based on tangible (materials, construction techniques) and intangible factors (belief systems, needs of different religions, dynasties and influences).**

**APAR130A**

**HISTORY OF ARCHITECTURE-I**

**CREDITS-2**

### **OVERVIEW:**

History of Architecture intends to form a connection between past and present in the context of architecture. The student starts to understand the evolution of forms, character, use of techniques and materials and their impact as a continuous process from the past to the present

e.g the journey of the dome in the Indian context. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.

The History of Architecture is studied over 5 semesters and is divided chronologically and regionally to understand and focus on a specific aspect in a particular semester.

### **OBJECTIVES AND EXPECTED OUTCOMES:**

The course shall include sketching and understanding of historical buildings, historical analyses, measured drawings and visit to places of historical importance.

Continuing with detailed study of Greek and Roman Architecture, the students study history of Architecture in the world with emphasis on, Byzantine, Romanesque and Gothic Architecture. The syllabus covers the techniques of construction and evolution of forms from Byzantine Architecture (types of domes, spanning of space with squinches, use of pendentives in important churches of Constantinople). The study continues with new construction methods of Romanesque Architecture with emphasis on massiveness, verticality and ornamentation of medieval churches and integration of centralized and longitudinal plans. Churches of Italy and France are studied for articulation of external wall like arcaded interiors and combination of the five towered structures and longitudinal basilica. Gothic Architecture with flying buttress, ribbed vault, use of stained glass in cathedrals and churches and its influence in Central Asian cities like Bukhara and Samarkand are covered to complete the course.

**The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation. The students will generate an understanding about the development and evolution of architecture as a culmination of various factors. The students are introduced to a chronological study of world architecture starting with development of civilizations in context of location, climate, socio-cultural, historical, economic and political influences. The students understand the building types and development of architectural form and character based on tangible (materials, construction techniques) and intangible factors (belief systems, needs of different religions, dynasties and influences).**



**OVERVIEW:**

This course will help the student develop the ability to generate and appreciate the background aspects of thinking & conceptualizing required in architectural design.

The course begins with a simple understanding of 2D design elements like point, lines and planes. While all of us can easily visualise a straight line in two dimensions, the sequence of creating planes, shapes, forms, spaces, enclosures and buildings in 3D is of great significance to a student of Architecture. All these are understood conceptually as well as in the context of built form.

Then the understanding is developed further by studying Circulation (Horizontal and Vertical and Circulation and Spaces between Buildings) and Order (Geometrical, structural, dimensional, material, spatial).

**OBJECTIVE AND EXPECTED OUTCOME:**

Theory of Design helps develop an understanding of elements and principles of design that eventually guide the students in pursuing practical design problems.

**The students finish the course by learning to articulate the concepts and manifest them into drawings by understanding the relationship of Plan, Section and Elevation, Architectural Scale and Programming in Architectural Design.**

**OVERVIEW:**

To familiarize the students with basic knowledge of good drafting and lettering techniques and architectural drawing to develop comprehension and visualization i.e. orthographic projections of simple & complex geometrical forms.

The course begins by giving a brief introduction of drafting instruments & their uses , further doing exercises in drafted and freehand architectural lettering & sheet layout.

Then the understanding the concept and types of lines. For understanding the representation of actual object to the drawing, the students need to understand the mode by which a larger object could be drawn by learning scale & its types & how to dimension a drawing on sheet.

Next to visualize a plane in 2 dimensional & a solid in 3 dimensional views the sequence of learning Orthographic projection with case specific as axis perpendicular to the H.P. & V.P. Drawings of the three dimensional compositions will be part of the studio exercises.

The students finish the course by learning section of solids & interpenetration of solids to familiarize the students with learning techniques & skills in representing different objects through 3D geometry and developing visualization of 3-D, for using in the design solutions. Studio exercises to be based on aptly & clearly communicating the relationship of drawing (with equipment) plans elevations, sections & development of surfaces & objects to the students.

**OBJECTIVE & EXPECTED OUTCOME:**

The objective of the course is introducing students to fundamental techniques of Visual representation and to equip with the basic principles of representation and enhancing the skills in developing a graphical language of architecture.

On completion of this subject students will be able to get interested in and to familiarize them with the art of design and architecture.

The primary outcome of the module are to: • Introduce students to the basic skills of architectural drawing, and use standard drawing equipment • Develop understanding of the language of

architectural drawing and the role it plays in communication of design work • Develop students' intellectual potential and learning capacity. • Draw free hand and use drawing instruments to produce: plans, sections, elevations to scale • present their work using traditional pencils, ink, colour pencils and pastels produce drawings including architectural symbols.

**APAR124A**

**ARCHITECTURAL DRAWING-II**

**CREDITS-4**

### **OVERVIEW:**

The course objective is to develop the capability of understanding and practice the application of the various techniques & skills in representing different objects through 3D geometry and developing visualization of 3-D through various types of projections, perspective, Sciography, as a basis of representing architectural design.

The course will start with the study of principles and techniques of axonometric, oblique and isometric views and construct three dimensional views of basic and complex geometrical shapes.

Next in the subject is to study the basic terms, principles, types and techniques of geometrical perspective drawing and to prepare perspective by measuring point method, angular and parallel perspective. To prepare drawings on the presentation of interior and exterior views in one point perspective and section perspectives. Competence in drawing skills is improved by trial and error practice using student centered learning.

The topic of perspective drawing will consist of drawing exercises on: Understanding the application of principles of perspective drawing, : Drawing perspective views by one point and two point perspective methods for simple objects, inclined planes, cylindrical objects, arches and other circular forms etc., :Perspective views of interior designs by projection / measuring point method.

The last topic of Sciography drawing will consists of drawing exercises on: Principles of shades and shadows & Drawing shades and shadows of lines, planes, solids and architectural features in plan, elevations and isometric view.

### **OBJECTIVE & EXPECTED OUTCOME:**

The subject objective is introducing students to fundamental techniques of architectural representation and to equip with the basic principles of representation.

**On completion of this subject students will be able to: use standard drawing equipment, draw free hand and use drawing instruments to produce: plans, sections, elevations to scale, Draw isometric and axonometric projections ,draw one and two point perspectives that would develop understanding of the language of architectural drawing and the role it plays in communication of design work.**

**APAR125A**

**ARTS & GRAPHICS-I**

**CREDITS-3**

### **OVERVIEW:**

This subject is a blend of the technique of art and architecture drawing that it teaches logics of rendering on conventional drawing format. The students of architecture, they learn how to render architecture forms as well as the nature around the proposed project with various drawing and painting mediums. It makes able students to observe nature and architecture forms through a graphic perspective. Scale, proportion, colour, texture are graphically represented through their sketching and coloring practices which is a helpful practice in their whole career to graphically justify their design. Various conventional graphical mediums will be used to represent the design, for instance, graphite pencil, charcoal, pen and ink, pastel colors and water colours. Since the students follow the scientific method of three dimensional drawing on two dimensional format, they can justify the concept and formal aspect of the architectural design with various ocular perspectives. As per the conventional architectural drawing practice every nook and corner of the

drawing should be detailed with specific drawing; sometimes colored. This subject offers practice of precise graphical rendering of plan, elevation, section, and landscape designing in Manual manner, which gives core foundation to students designing capacity.

#### **OBJECTIVE AND EXPECTED OUTCOME:**

Architectural graphics introduces graphical entity of architectural drawing along with the application of different drawing and painting mediums. With this students can develop their drafting skills that precision in using scale proportion with aesthetical certain criteria. How to render three dimensional geometric and irregular forms (architectural) accordingly the proposed architecture design with the effect of reaching of light and geography is one of the main concerns in architectural graphics studies. So sketching from the nature and understanding of natural light effects on object are taught in this subject. Different types of perspective and views are scientifically practicing in the rendering.

Finally, the students study how to use different type of markers and drafting pens for rendering, and gain precision in architectural drawing with markers and pen. Architectural Model making and sculpting technique is one of the practice along with rendering technique that students gain the knowledge of making three dimensional forms . The basic model making mediums such as clay, plaster of Paris, sun-board and various types' foams are used for making models which gives the experience of three dimensional modeling in architecture to the students.

**APAR132A**

**ARTS & GRAPHICS-II**

**CREDITS-3**

#### **OVERVIEW:**

The sense of designing is evolved from the observation of nature and its mechanism that the logic of creation and Recreation is intrinsic in the different objects of nature and this concept is derived as knowledge in the process of designing for making new functional and art object (Bio-mimicry) . For developing the observation capacity, we need to interact with nature and document the feature by sketching and painting. Students extract the inherent logic of construction, its structural stability as wells the aesthetics. By doing the sketching and painting they can enhance their drafting skill in architectural drawing and they can improve their detailing of different areas of design. Practicing water coloring along with the architectural drawing is a practice of illustrating the concept of design with its reference in actual color and texture. This course introduces the sculpting technique such as molding a three dimensional foam with clay, POP and foams. Students study the direct modeling and craving technique with application of different tools. How students can make the miniature foam of their models to understand about the three dimensionality of their design. By practicing such things in this course students gain the capability of handling different modeling and sculpting mediums.

#### **OBJECTIVE AND EXPECTED OUTCOME:**

Under the development of technology human civilization has gained lot of sophisticated skills such as designing software, printing technology and three dimensional printing. These technologies reduced the human effort and put forward more perfection in output. But the man kind earned all these achievements through the manual efforts in the history and it became the part of the history of human civilization. Although the technology is alternative to the huge consumption of time in manual design, the manual practice of drawing, painting and sculpting are considered as the base of designing. This will help students to understand about the uniqueness of their vision and how it can be simply transferred into the two dimensional and three dimensional forms. The beautification of interior and exterior of architecture also can be artistically designed that the arrangement of lights, furniture, decorative paintings and murals can be designed by the students for their design. By developing their artistic skill they can elevate the architectural designing as cultural activity rather than simply arrange the space for dwelling.

**OVERVIEW:**

All human made objects have logic of making; we hand over this logic through generations. Some are traditional and other is purely modern engineering. This subject is the collaboration of traditional and modern carpentry techniques and metal welding. The basic carpentry technique and wood joints are analyzed and produced the furniture models in the carpentry workshop. Students practice for using different type of wood for making furniture designs such as hard and soft woods. Different types of wood joints and its mechanism are produce in the workshop. Carpentry joints' technical terms, classification of joints, lengthening, spliced or longitudinal joints; bearing joint, framing joint, angle/ corner joint, oblique/ shouldered joint, widening or side joint. The modern carpentry tools and machines are introduced to understand about the carpentry tools, process and wood working machines. Students make three dimensional solids like cube, cuboids, pyramids, spheres, cone and cylinders and make a composition with the help of tools and machines.

Fastenings, Carpentry tools for cutting wood and making joints are practiced as well as connecting various devices in the process of wood working. Demonstrated the use of carpentry tools in making joints such as dovetail joint, mortise and tenant joint, butt joint etc. to be used for making furniture. With practice of above mentioned things students design the conventional furniture such as chair, tables and others.

Apart from the carpentry workshop practice, metal welding is trained that different types of metal welding techniques and joints are to be done example, (Lap and Butt) by metal arc welding.

**OBJECTIVE AND EXPECTED OUTCOME:**

This course introduces the carpentry tools to the students for wood Planing, cutting, chiseling and joining. In that, the logistic with the traditional carpentry tools and wood working machines are provided to make different specimens of carpentry works and learn about carpentry joints. This practical subject makes able students to learn about the reinforcement of wooden structure with the help of various types of wood joins and its technical issues. They can compare the modern and traditional wood working techniques that the alternative technique for the time savings and physical strain free working technique. This enables students to make furniture and architectural wooden structures from their own design without the help of a technician.

Metal welding technique and sophisticated joints are taught to students in the workshop to understand about the modern metal architectural structures. Different types welding techniques are practiced such as Shielded Metal Arc Welding (SMAW) with this particular type of welding, the welder follows a manual process of stick welding. ...Gas Metal Arc Welding (GMAW/MIG) This style of welding is also referred to as Metal Inert Gas (MIG). ... Flux Cored Arc Welding (FCAW) ...Gas Tungsten Arc Gas Welding (GTAW/TIG). Eventually, this course gives the technical training about the modern and traditional techniques of wood working, carpentry and metal welding.

Students get the training of different technique of wood working in lathe machine and use of different lathe carving chisels. With this technique students can understand how can be a solid three dimensional form carved; as a practice students make basic geometric three dimensional forms with the help of wood working lathe. Here, in their final projects students make the furniture designs with the help of various carpentry techniques.

**OVERVIEW:**

Structural design is the methodical investigation of the stability, strength and rigidity of structures. Structural design-I will give students an overview of basic elements of structure and application of mechanics principle. The course structure is designed in such a way to give the basic idea of conceptual understanding used in the design of structural elements capable of resisting all applied

loads without failure during its intended service life.

#### **OBJECTIVES & EXPECTED OUTCOMES:**

To introduce the students with the basic principles of mechanics applied to structural elements.

Application of mechanics principle

Composition & Resolution of Forces: Types of forces, resolution of forces, laws related to composition and resolution of forces, Application of couple and forces equilibrium.

Centre of gravity of different bodies: Definition of Centroid and centre of gravity, Methods of finding out C.G. & Centroid of plane figures; Symmetrical sections, unsymmetrical sections, solids by different methods – Geometrical, By moments, & Graphical method.

Moment of Inertia: Definition and theorems and methods for finding out Moment of Inertia of different structural elements.

Introduction to beams and different end conditions subjected to beams and calculations of reactions developed due to these end conditions.

**The course curriculum will make students understand terminology related to structural design, practical application of concepts of physics to be applied on structural elements and prepare them to take further steps into the field of structural design.**

**APCE114A**

**STRUCTURAL DESIGN-II**

**CREDITS-2**

#### **OVERVIEW:**

Structural design-II will provide an understanding about the behavior of different materials used in construction of various elements of buildings and other structures. Students will investigate the behavior of structural systems and elements through design exercises, case studies, and load testing of models. Students will design structures using masonry, steel, and concrete and will gain an appreciation of the importance of structural design today, with an emphasis on environmental impact of large-scale construction.

#### **OBJECTIVES & EXPECTED OUTCOMES:**

To strengthen the students' knowledge about fundamental structural forces in buildings and the methods of analysis and calculations. To introduce to the forces acting on vertical structural members and fundamentals of soil mechanics.

Analysis of trusses- Definition and terminology related to trusses. Methods used for analysis of trusses and their practical application.

Properties of Cement, Concrete and steel- Properties, tests and behavior of material on the application of forces. Design mix of concrete. This course will also include testing of material in lab and mix design of concrete blocks.

Application of reinforce cement concrete- Theories, assumption in the design of concrete using steel as a reinforcing material.

Analysis and design of beams- Concept, design aspects and codal provisions used in the designing of R.C.C. beams.

**The course curriculum will make students understand material properties used in the construction practices. The outcome of the course will make students capable enough to design concrete mix for construction purposes as well as design of beams as a structural element.**

**OVERVIEW:**

Everything that surrounds and affects living organisms is environment. Environment includes all those things on which we are directly or indirectly dependent for our survival, whether it is living or biotic components like animals, plants or non-living or abiotic components like soil, air and water etc. It belongs to all, influences all and is important to all.

Environmental Protection Act (1986) defined "Environment as the sum total of water, air and land, their interrelationship among themselves and with the human beings, other living organisms and materials." Environmental studies are important since it deals with the most mundane problems of life like hygienic living conditions, safe and clean drinking water, fresh air, healthy food and sustainable development.

The syllabus for Environmental Studies includes conventional class room teaching as well as field work. In this course the teacher simply acts as a catalyst to infer what the student observes or discovers in his/her own environment. Involvement of students in project work is one of the most effective learning tools for environmental issues. This syllabus is beyond the scope of text book teaching and also the realm of real learning by observing the surroundings. The content of this course provides an overview of introduction to environment, concept of an ecosystem, various renewable and non-renewable resources, how are various biodiversity occur and different means to conserve these. This course also includes various types of pollution and environmental policies & practices related with environs. Finally, it also highlights the relationship of human population with environment. The course further integrates to project work such as visit to an area to document environmental assets river/ forest/ grassland/ hill/ mountain, visit to a local polluted site- Urban/Rural/Industrial/Agricultural, study of common plants, insects, birds, and study of simple ecosystems. These studies are as imperative as it forms a unique synergistic tool for comprehensive learning process. This will help students to recognize and appreciate how the technological advancement at global level, exponential growth of human population and their unlimited demands has put the environment at stake and has contaminated the environment worldwide.

**OBJECTIVES AND EXPECTED OUTCOME:**

The main objective of the course is to create consciousness among the students with the idea about healthy and safe environment. This course is aimed to explain students that the rapid industrialization, crazy consumerism and over-exploitation of natural resources have resulted in degradation of earth at all levels. These changes need the discussion, concern and recognition at national and international level with respect to formulate protection acts and sustainable developments policies. It can be possible only if every citizen of the nation is environmentally educated and gets involved into this matter at the grass root level to mitigate pollution.

**After studying the course, the learners will be able to comprehend and become responsive regarding environmental issues. They will acquire the techniques to protect our mother earth, as without a clean, healthy, aesthetically beautiful, safe and secure environment no specie can survive and sustain. This is the only inheritance which every genera of specie passes to their future generation.**

**OVERVIEW:**

In the view of the growing importance of English as a global language and the language of international business, its impact on every field of work cannot be denied or ignored. This course focuses on the four foundational skills of language learning- reading, writing, speaking, and listening. Through this course, the students are expected to learn how to use various technological

tools to support their communication efforts. Latest technological advancement and change in social and corporate systems demand that students send clear verbal and non-verbal messages, and apply critical thinking and problem solving skills.

**OBJECTIVES AND EXPECTED OUTCOMES:**

Upon successful completion of the course, the students will be able to communicate confidently in both formal and informal situations and also learn the significance of verbal and non-verbal communication in professional world. This course aims at familiarizing students with the strategic challenges and ethical requirements of public speaking and also developing written communication skills through reports, interviews, and resume writing. It also exposes the learners to the professional and social etiquettes in order to empower them to be successful professionals and individuals.

**The focus of this learning program is developing, evaluating and enhancing communication skills required for professional success.**

Annexure										
B.Arch. Year 2019-24 ( Scheme of Studies)										
SOAP										
ODD SEMESTER						EVEN SEMESTER				
Year	Sno	Course Code	Course Title	To- tal Hrs	C	Sno	Course Code	Course Title	To- tal Hrs	C
First	1	APAR117A	BASIC DESIGN & CREATIVE WORKSHOP	10	10	1	APAR118A	ARCHITECTURAL DESIGN-I	6	6
	2	APAR119A	BUILDING CONSTRUCTION & MATERIALS-I	5	5	2	APAR120A	BUILDING CONSTRUCTION & MATERIALS-II	5	5
	3	APAR129A	HISTORY OF CULTURE & CIVILISATION	2	2	3	APAR128A	THEORY OF DESIGN	2	2
	4	APAR123A	ARCHITECTURAL DRAWING-I	6	6	4	APAR124A	ARCHITECTURAL DRAWING-II	4	4
	5	APAR125A	ARTS & GRAPHICS-I	3	3	5	APAR126A	WORKSHOP	4	2
	6	APCE113A	STRUCTURAL DESIGN-I	2	2	6	APCE114A	STRUCTURAL DESIGN-II	2	2
	7	BSCH125A	ENVIRONMENTAL STUDIES	3	3	7	APAR471A	PROFESSIONAL COMMUNICATION	3	3
						8	APAR130A	HISTORY OF ARCHITECTURE-I	2	2
						9	APAR132A	ARTS & GRAPHICS-II	3	3
			<b>TOTAL</b>	<b>31</b>	<b>31</b>			<b>TOTAL</b>	<b>31</b>	<b>29</b>



<b>Second</b>		1	APAR217A	ARCHITECTURAL DESIGN-II	10	10	1	APAR218A	ARCHITECTURAL DESIGN-III	10	10
		2	APAR219A	BUILDING CONSTRUCTION & MATERIALS-III	5	5	2	APAR220A	BUILDING CONSTRUCTION & MATERIALS-IV	5	5
		3	APAR241A	HISTORY OF ARCHITECTURE-II	2	2	3	APAR232A	HISTORY OF ARCHITECTURE-III	2	2
		4	APAR239A	ENVIRONMENT & CLIMATE	2	2	4	APAR222A	ARTS & GRAPHICS-IV	3	3
		5	APAR225A	ARTS & GRAPHICS-III	3	3	5	APAR224A	COMPUTER APPLICATION IN ARCHITECTURE-II	4	2
		6	APAR227A	COMPUTER APPLICATION IN ARCHITECTURE-I	4	2	6	APCE228A	STRUCTURAL DESIGN-IV	2	2
		7	APCE237A	STRUCTURAL DESIGN-III	2	2	7	APCE230A	BUILDING SERVICES-I (WATER SUPPLY & SANITATION)	2	2
		8	APCE233A	SURVEYING & LEVELLING	1	1					
		9	APCE235A	SURVEYING & LEVELLING LAB	2	1					
			<b>TOTAL</b>	<b>31</b>	<b>28</b>			<b>TOTAL</b>	<b>28</b>	<b>26</b>	
<b>Third</b>		1	APAR325A	ARCHITECTURAL DESIGN -IV	10	10	1	APAR318A	ARCHITECTURAL DESIGN-V	10	10
		2	APAR331A	BUILDING CONSTRUCTION & MATERIALS-V	5	5	2	APAR320A	BUILDING CONSTRUCTION & MATERIALS-VI	5	5
		3	APAR333A	MODERN WORLD ARCHITECTURE	2	2	3	APAR336A	TOWN PLANNING	2	2
		4	APAR329A	HOUSING	2	2	4	APAR310A	WORKING DRAWING & BUILDING BYELAWS	5	5
		5	APAR323A	COMPUTER APPLICATION IN ARCHITECTURE-III	4	2	5	APCE332A	STRUCTURAL DESIGN-VI	2	2
		6	APCE315A	STRUCTURAL DESIGN-V	2	2	6	APAR328A	BUILDING SERVICES-III (ACOUSTICS)	2	2
		7	APCE317A	ESTIMATING, COSTING & SPECIFICATIONS	2	2	7	APAR334A	AIR CONDITIONING & MECHANICAL SERVICES	2	2
		8	APEE321A	BUILDING SERVICES-II (ELECTRICAL & LIGHTING)	2	2					
			<b>TOTAL</b>	<b>29</b>	<b>27</b>			<b>TOTAL</b>	<b>28</b>	<b>28</b>	

Fourth	1	APAR419A	ARCHITECTURAL DESIGN -VI	10	10	1	APAR402A	PROFESSIONAL TRAINING	18
	2	APAR421A	BUILDING CONSTRUCTION & MATERIALS-VII	5	5				
	3	APAR431A	PROFESSIONAL PRACTICE & OFFICE MANAGEMENT	2	2				
	4	APAR425A	PROJECT CONSTRUCTION MANAGEMENT	2	2				
	5		ELECTIVE-I	3	3				
	6		ELECTIVE-II	3	3				
			<b>TOTAL</b>	<b>25</b>	<b>25</b>			<b>TOTAL</b>	<b>18</b>
Fifth	1	APAR519A	DISSERTATION	6	6	1	APAR520A	ARCHITECTURAL THESIS	18
	2	APAR521A	URBAN DESIGN	10	10	2	APAR522A	SEMINAR	4
	3		ELECTIVE-III	3	3				
	4		ELECTIVE-IV	3	3				
			<b>TOTAL</b>	<b>22</b>	<b>22</b>			<b>TOTAL</b>	<b>22</b>
									<b>22</b>
									<b>22</b>

Elective Subjects	<b>List of Electives</b>									
	1	APAR407A	ARCHITECTURAL CONSERVATION	3	3	7	APAR507A	LOW COST CONSTRUCTION TECHNOLOGY	3	3
	2	APAR427A	SITE PLANNING & LANDSCAPE DESIGN	3	3	8	APAR509A	WATER RESOURCE MANAGEMENT	3	3
	3	APAR411A	ART MOVEMENTS & ARCHITECTURE	3	3	9	APAR511A	INTEGRATED WASTE MANAGEMENT & TECHNOLOGY	3	3
	4	APAR413A	SUSTAINABLE ARCHITECTURE	3	3	10	APAR513A	INTERIOR DESIGN	3	3
	5	APAR415A	INTELLIGENT BUILDINGS	3	3	11	APAR515A	VERNACULAR ARCHITECTURE	3	3
6	APAR433A	VISUAL ARTS	3	3	12	APAR517A	STRUCTURAL SYSTEMS	3	3	
										<b>247</b>
										<b>256</b>