K.R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

SCHOOL OF ARCHITECTURE & PLANNING (SOAP)

BACHELOR OF ARCHITECTURE

B. Arch

Programme Code: 16

2020–25

Approved in the 23rd Meeting of Academic Council Held on 23 June 2020

Academic Council
Member Secretary
K.R. Mangalam University

Registrar
K.R. Mangalam University
Sohna Road, Gurugram, (Haryana)

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Preface

K.R. Mangalam University envisions all its programmes in the best interest of the students. It imbibes an outcome based curriculum for all its programmes to provide a focused, student-centric syllabus with an agenda to structure the teaching-learning experiences in a more outcome based manner.

The outcome based curriculum strengthens students' experiences and prepares the students for academia, employability and life-long learning.

Each programme reflects the promise to accomplish the learning outcomes by studying the courses. The graduate attributes encompass values related to the well-being, emotional stability, critical thinking, and social justice.

The redesigned curriculum focuses on the multi-disciplinary nature of the field of design with emphasis on core design subjects with skills to represent the process of design graphically.

Another important part is the aspect of realizing the concept into graphical representation and a workable design. Students are exposed to research and hands on project-based education with active studio sessions. Visiting faculty and external examiners are professionals and academicians chosen from the field of design. Students develop their design with inputs from a highly driven team of faculty members and working professionals.

K.R. Mangalam University hopes that the outcome based curriculum will help students in realizing their careers as informed, sensitive and creative architects and designers.

Salient features of this model curriculum are:

1. Curriculum has been designed in such a way that it encourages innovation and research.
2. The revised curriculum has been designed where the students can understand the industry requirements and have hands-on experience.
3. The students will develop a problem-solving approach and will meet the challenges of future.
4. Emphasis on hands-on training has been promoted by including six-months Professional Training in eighth semester.
5. Bachelor of Architecture Department will ensure the revision of the curriculum to help students to achieve better employability, start-ups, and other avenues for higher studies.

ACKNOWLEDGEMENT

Programme : Bachelor of Architecture
Year/ Semester : 5 Years/ 10Semesters Session : 2020-2025

The development of an outcome-based Model Curriculum for Undergraduate degree courses in the Department of Architecture is a result of thoughtful deliberations at various stages of dedicated and specialized experts. This model curriculum has been framed to meet the expectations of an academically challenging environment, develop problem-solving skills by students and align with current standards and to enrich the students to make them self-enablers and/or match job requirements on successful completion of their degrees.

We are greatly gratified Ms. Manvi Arora for her supervision contribution, guidance, and support throughout the development of this curriculum. Special thanks and gratitude to Prof. Aditya Malik, Vice Chancellor, K.R. Mangalam University and Prof. Anita Sharma, Pro-Vice Chancellor and Registrar, K.R. Mangalam University who have been instrumental and encouraging throughout the process of developing this curriculum. Last, but not the least, we also sincerely thank to Ar. Praveen Gupta, Ar. Pankaj Dhayal, Ar. Poorva Priyadarshini who have contributed for development of this curriculum.

We acknowledge by signing below that we have received and access to a copy of syllabus of the B.Arch Programme indicated above. We have redesigned the B.Arch syllabus in Outcome Based Format and understand the programme specific outcomes of the B.Arch Programme.

Furthermore, we acknowledge that the contents of the B.Arch syllabus have been explained and/or read to us. We understand the requirements concerning textbook(s), assignments, practicum and evaluation and how the final grades will be determined with respect to achieving Course Outcomes.

Prepared by:
Ar. Nisha Sharma
(Assistant Professor)

Verified by:
Prof. Hemani Singh
(Dean SOAD)

Approved by:

Registrar

Contents

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 KRMU 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

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

2. Objectives

a) To impart undergraduate, post graduate and doctoral education in identified areas of higher education.

b) To undertake research programmes with industrial interface.

c) 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.

d) To act as a nodal center for transfer of technology to the industry.

e) To provide job oriented professional education to the Indian student community with particular focus on Haryana.

3. About School

School of Architecture & Planning (SOAP) includes:

I. Department of Architecture
   i. Bachelor of Architecture (B.Arch): Council of Architecture (COA) approved five years Programme

II. Department of Design
   i. Bachelor of Interior Design (BID) : 4 year programme,
   ii. B.Sc. Hons. (Interior Design) : 3 year programme,

3.1. School Vision

The School aspires to become a leading Architecture and Planning school by empowering the students with knowledge, confidence and skillset required to navigate their professional path as innovative, creative, socially responsible professionals contributing to nation building through ethical design practices grounded in sustainability and multidisciplinary awareness.

3.2. School Mission

a) To establish a foundation for lifelong learning

b) To apply current educational theories that see learning as a process wherein the learner constructs or builds new concepts, focusing on learner-centric education vs. teacher-centric education.

c) To transform the role of teacher to that of facilitator, guide and mentor and not a transmitter of information

d) Enhance employability and entrepreneurship through interdisciplinary curriculum and progressive pedagogy with latest technology to produce graduates capable of critically synthesizing architecture, engineering systems, social sciences and entrepreneurial skills.

e) Developing active leadership skills as project leaders with understanding of various disciplines and collaboration with all stakeholders.

f) To encourage diverse learning styles, acknowledging Kolb's Experiential Learning Theory, which suggests that learning is cyclical and moving through this continuum over time every learner discovers the learning style best suitable to the person.

g) To enable students to learn to find meanings and connections by critical contemplation of available resources, strengthening the innate skills of reflection, evaluation, re-iteration and research.

h) To empower learning by doing. The Design studio is considered both a course and a place of study at the heart of an academic environment fostering design thinking that is simultaneously analytical and creative.

i) Develop ethical professional qualities among the students with understanding of environmental realities and context related design.

4. Department of Architecture

Department of Architecture offers undergraduate Bachelor of Architecture (B.Arch): Council of Architecture (COA) approved five years Programme.

4.1. Graduate Attributes

GA1: Creative, Sensitive and Adaptable architecture Professional
GA2: Equipped with Professional Ethics
GA3: Good at communication: Interpersonal and graphical.
GA4: Rational decision maker
GA5: Collaborative with multidisciplinary knowledge
GA6: Good at Modern Technology Usage.

4.2. Programme Outcomes

PROGRAMME OUTCOMES (POs) of School of Architecture and Planning Programme: Students of all **undergraduate Bachelor of Architecture** degree programme at the time of graduation will have-

PO1. Design and Integration: Work collaboratively toward design resolution which integrates an understanding of the requirements, contextual and environmental connections, construction systems and services with responsible approach to environmental, historical and cultural conservation.

PO2. Drawing Work: Produce professional quality graphic presentations and technical drawings/documents.

PO3. Critical Analysis: Demonstrate critical thinking through a self-reflective process of conceptualization and design thinking that is open to consideration of alternative perspectives by analyzing, evaluating, and synthesizing ideas and information.

PO4. Employability and Interdisciplinary Approach: Students can work effectively in a multi-disciplinary team in the building and design industry.

PO5. Conduct: Work in a manner that is consistent with the accepted professional standards and ethical responsibilities. Conduct independent and directed research to gather information related to the problems in design and allied fields.

PO6. Communication and Teamwork: Apply visual and verbal communication skills at various stages of the design and delivery process. Also work as an integral member in collaboration with multi-disciplinary design and execution teams in the building and design industry.

PO7. Life-long learning: Thrive in a rigorous intellectual climate which promotes inquiry through observation and research and to show curiosity to learn about new developments in design.

5. The Programme B.Arch

Bachelor of Architecture (B. Arch.): 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.

5.1. Eligibility Criteria

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

a) Qualified recognized aptitude test in Architecture (NATA or equivalent).

b) Have gone through any of the following curriculum with Marks as prescribed below:

10+2 or equivalent examination of central/State Govts. with 50% aggregate marks and with Physics, Chemistry and Mathematics as compulsory subjects of examination ; or

10+3 Diploma (any stream) recognized by Central /State Govts. with 50% aggregate marks with Mathematics as a compulsory subject of examination ;or

5.2. Career Options

Opportunities exist in both public & private sector, in the field of Architecture & Building construction industry. Independent professional practice is also an option in this field.

5.3. 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.

5.4. Programme Specific Outcomes

PSO1. Translation of Concept to Presentation and Working Drawings: Translation and development of ideas into two and three-dimensional graphic representation techniques using a wide variety of traditional and digital media.

PSO2. Knowledge of Construction and Structural Systems and Building Techniques: Demonstrate the ability to synthesize into an integrated design solution by employing appropriate building materials, building systems, structures and construction practices grounded in environmental sustainability.

PSO3. Design at Varying Scales: Incorporate a wide range of skills and professional architectural knowledge to produce designs of various scales and complexity; from interior projects to buildings, landscape, conservation projects to urban scale developments.

PSO4. Team Leader and Project Manager: Understanding how to collaboratively lead teams of stakeholders in the process of conceiving, developing and implementing solutions to problems in the built and natural environments, utilizing knowledge of professional practice along with associated ethical, legal, financial and social responsibilities.

PSO5. Architect and Society: The knowledge and ability to apply a design decision-making process through appropriate technical documentation in a manner that is sustainable, aesthetic, cost effective, and socially responsible.

5.5. Class Timings

- ✓ The classes will be held from Monday to Friday from 9.10 am to 4.10 pm.

5.6. Programme scheme

- ✓ For B.Arch Programme Scheme is attached in Annexure I.

5.7. 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, Tittle and credits (C) of the course. This is followed by the course objectives, syllabus (Unit I to IV), Text book and reference books.

5.7.1. Two Year B.Arch Course at a Glance

	Courses	**Credits**
Semester I	7	31
Semester II	9	29
Semester III	9	28
Semester IV	7	26
Semester V	8	27
Semester VI	7	28
Semester VII	6	25
Semester VIII	1	18
Semester IX	4	22
Semester X	2	22
Total	**60**	**256**

5.7.2. Course Structure for B.Arch Programme

SEMESTER I			
S.no	Course Code	Course Title	Credits
1	APAR117A	BASIC DESIGN & CREATIVE WORKSHOP	10
2	APAR119A	BUILDING CONSTRUCTION & MATERIALS-I	5
3	APAR129A	HISTORY OF CULTURE & CIVILISATION	2
4	APAR123A	ARCHITECTURAL DRAWING-I	6
5	APAR125A	ARTS & GRAPHICS-I	3
6	APCE113A	STRUCTURAL DESIGN-I	2
7	BSCH125A	ENVIRONMENTAL STUDIES	3
		Total	**31**

SEMESTER II			
S.no	Course Code	Course Title	Credits
1	APAR118A	ARCHITECTURAL DESIGN-I	6
2	APAR120A	BUILDING CONSTRUCTION & MATERIALS-II	5
3	APAR128A	THEORY OF DESIGN	2
4	APAR124A	ARCHITECTURAL DRAWING-II	4
5	APAR126A	WORKSHOP	2
6	APCE114A	STRUCTURAL DESIGN-II	2
7	APAR130A	HISTORY OF ARCHITECTURE-I	2
8	APAR132A	ARTS & GRAPHICS-II	3
9	APAR471A	PROFESSIONAL COMMUNICATION	3
		Total	**29**

SEMESTER III			
S.no.	Course Code	Course Title	Credits
1	APAR217A	ARCHITECTURAL DESIGN-II	10
2	APAR219A	BUILDING CONSTRUCTION & MATERIALS-III	5
3	APAR241A	HISTORY OF ARCHITECTURE-II	2
4	APAR239A	ENVIRONMENT & CLIMATE	2
5	APAR225A	ARTS & GRAPHICS-III	3
6	APAR227A	COMPUTER APPLICATION IN ARCHITECTURE-I	2
7	APCE237A	STRUCTURAL DESIGN-III	2
8	APCE233A	SURVEYING & LEVELLING	1
9	APCE235A	SURVEYING & LEVELLING LAB	1
		Total	**28**

SEMESTER IV			
S.no.	Course Code	Course Title	Credits
1	APAR218A	ARCHITECTURAL DESIGN-III	10
2	APAR220A	BUILDING CONSTRUCTION & MATERIALS-IV	5
3	APAR232A	HISTORY OF ARCHITECTURE-III	2
4	APAR222A	ARTS & GRAPHICS-IV	3
5	APAR224A	COMPUTER APPLICATION IN ARCHITECTURE-II	2
6	APCE228A	STRUCTURAL DESIGN-IV	2
7	APCE230A	BUILDING SERVICES-I (WATER SUPPLY & SANITATION)	2
		Total	**26**

SEMESTER V			
S.no.	Course Code	Course Title	Credits
1	APAR325A	ARCHITECTURAL DESIGN -IV	10
2	APAR331A	BUILDING CONSTRUCTION & MATERIALS-V	5
3	APAR333A	MODERN WORLD ARCHITECTURE	2
4	APAR329A	HOUSING	2
5	APAR323A	COMPUTER APPLICATION IN ARCHITECTURE-III	2
6	APCE315A	STRUCTURAL DESIGN-V	2
7	APCE317A	ESTIMATING, COSTING & SPECIFICATIONS	2
8	APEE321A	BUILDING SERVICES-II (ELECTRICAL & LIGHTING)	2
		Total	**27**

SEMESTER VI			
S.no.	Course Code	Course Title	Credits
1	APAR318A	ARCHITECTURAL DESIGN-V	10
2	APAR320A	BUILDING CONSTRUCTION & MATERIALS-VI	5
3	APAR336A	TOWN PLANNING	2
4	APAR310A	WORKING DRAWING & BUILDING BYELAWS	5
5	APCE332A	STRUCTURAL DESIGN-VI	2
6	APAR328A	BUILDING SERVICES-III (ACOUSTICS)	2
7	APAR334A	AIR CONDITIONING & MECHANICAL SERVICES	2
		Total	**28**

SEMESTER VII			
S.no.	Course Code	Course Title	Credits
1	APAR419A	ARCHITECTURAL DESIGN -VI	10
2	APAR421A	BUILDING CONSTRUCTION & MATERIALS-VII	5
3	APAR431A	PROFESSIONAL PRACTICE & OFFICE MANAGEMENT	2
4	APAR425A	PROJECT CONSTRUCTION MANAGEMENT	2
5		ELECTIVE-I	3
6		ELECTIVE-II	3
		Total	**25**

SEMESTER VIII			
S.no.	Course Code	Course Title	Credits
1	APAR402A	PROFESSIONAL TRAINING	18
		Total	**18**

SEMESTER IX			
S.no.	Course Code	Course Title	Credits
1	APAR519A	DISSERTATION	6
2	APAR521A	URBAN DESIGN	10
3		ELECTIVE-III	3
4		ELECTIVE-IV	3
		Total	22

SEMESTER X			
S.no.	Course Code	Course Title	Credits
1	APAR520A	ARCHITECTURAL THESIS	18
2	APAR522A	SEMINAR	4
		Total	**22**

LIST OF ELECTIVES			
S.no.	Course Code	Course Title	Credits
1	APAR407A	Architectural Conservation	3
2	APAR427A	Site Planning & Landscape Design	3
3	APAR411A	Art Movements & Architecture	3

4	APAR413A	Sustainable Architecture	3
5	APAR415A	Intelligent Buildings	3
6	APAR433A	Visual Arts	3
7	APAR507A	Low Cost Construction Technology	3
8	APAR509A	Water Resource Management	3
9	APAR511A	Integrated Waste Management & Technology	3
10	APAR513A	Interior Design	3
11	APAR515A	Vernacular Architecture	3
12	APAR517A	Structural Systems	3

6. DETAILED SYLLABUS

SEMESTER I

APAR117A	**BASIC DESIGN & CREATIVE WORKSHOP**	**C**
		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.

APAR 119A	BUILDING CONSTRUCTION & MATERIALS-I	C 05

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. ½, 1, 1**
  ½ 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**.**

APAR129A	**HISTORY OF CULTURE & CIVILIZATION**	**C**
		02

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, Mesoptamia, 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).

APAR123A	**ARCHITECTURAL DRAWING-1**	**C**
		06

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.

APAR125A	**ARTS & GRAPHICS- I**	**C**
		03

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 Manuel 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 modal 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.

APCE113A	**STRUCTURAL DESIGN –I**	**C** **02**

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.

BSCH125A	**ENVIORNMENTAL STUDIES**	**C** **3**

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.

OBJECTIVE 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.

SEMESTER II

APAR118A	**ARCHITECTURAL DESIGN-I**	**C**
		06

OVERVIEW:

Introduction to basic design and the basic understanding of 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 studentsabout 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 of the final design necessary for greater comprehension.

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.

APAR120A	**BUILDING CONSTRUCTION & MATERIALS-II**	**C**
		05

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 Tiber Products andtheir 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 Ledged 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-PostTruss

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.

APAR128A	**THEORY OF DESIGN**	**C**
		02

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.

APAR124A	**ARCHITECTURAL DRAWING-II**	**C**
		04

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 starts 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.

APAR126A	**WORKSHOP**	**C**
		02

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 Plaining, 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**.**

APCE 114A	**STRUCTURAL DESIGN –II**	**C**
		02

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.

APAR130A	**HISTORY OF ARCHITECTURE-I**	**C**
		02

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).

APAR132A	**ART & GRAPHICS-II**	**C**
		03

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.

APAR471A	**PROFESSIONAL COMMUNICATION**	**C**
		03

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.

SEMESTER III

APAR217A	**ARCHITECTURAL DESIGN – II**	**C**
		10

OVERVIEW:

- To foster understanding about land and landforms and the elements of built space.
- Experimentation with shapes forms and materials to increase sensitivity to build volumes.
- Introduction to vernacular architecture, use of local materials and appreciation of the socio-economic background of the users.
- The projects would address the study of built form and its relationship to the site, surroundings and climatic setting.
- The study would induce students to experiment with built and open space.

OBJECTIVES & EXPECTED OUTCOME:

Veranacular Traditions in Architecture: Study of the social and physical environment and methods of construction in vernacular architecture, evolving from the traditional ways of life of the people in a given place. This may be a village or part of a small town.

(Suggested exercises: The students may be divided into groups, each group given to study one particular climatic zone of India in detail, and to make reports & graphical presentations on vernacular architecture evolving out of regional characteristics, in their respective zone of study.)

Major Design problem: Design of a simple building for public activity in a non-urban or semi-urban setting, or a situation without any bye-laws.

Introduction to others role players in the architectural design process – the client and users. Design problem can be related to play school, healthcare center small shopping complex or similar projects set in a non-urban area.

The students should be encouraged to endorse vernacular designs in their Design proposals.

The study would induce students to experiment with built and open space and its relationship to the site, surroundings and climatic setting.

Students would also be familiarized with vernacular architecture- use of local materials and appreciation of the socio-economic background of the users.

APAR219A	BUILDING CONSTRUCTION & MATERIALS-III	C 05

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.

OBJECTIVES & EXPECTED OUTCOME:

To introduce construction details of various elements of single storied building of load-bearing masonry and foundations.

Materials:

- Introduction to Mortars and Plasters such as cement and lime, types of Pointing & Jointing
- Detailed study of Infill wall of Bricks and various cement concrete products.
- Types of Roof Tiles. Communication through Drawings: -
- Foundation- types- isolated and combined footing. Raft and Pile Foundation (basic)
- Expansion joint details
- Introduction to various types of Staircases- details of RCC staircase.
- Different types of Flooring: Stone Flooring, Terrazzo Flooring, Wooden Flooring etc.
- Different types of Roofs (brick roof, Jack arch roof etc.) and Roof Coverings

Upon completion of the course, the student shall have acquired the concept of various components of buildings, materials used and methods of construction. The students have acquired knowledge in both conventional as well as vernacular building practices.

APAR241A	**HISTORY OF ARCHITECTURE-II**	**C** **02**

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.

OBJECTIVES & EXPECTED OUTCOME:

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).

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

After understanding the development of architecture in different parts of the world, the focus shifts to the Indian subcontinent. Picking up from Vedic period after Indus Valley Civilization, the students are exposed to Buddhist, Hindu and Islamic architecture with emphasis on Mughal Architecture.

Starting with the origin and influence of Buddhist Architecture (Ajivkyas and Cave Architecture, growth of Sanchi, toranas, chaitya halls, Amravati stupa) with emphasis on symbolism and structural functions. Also * Buddhist Rock Cut Architecture (Hinayana and Mahayana): Includes Early Hinayana Phase and Buddhist Viharas and Monastries. Also includes caves in western ghats, Karli, Nalanda, Sarnath and Gaya. Also Ajanta Caves and the subsequent early Hindu shrines. Hindu Architecture continues with Nagara Style, Dravidian Style, Vesara Style of temples and Forts, Palaces, stepwells, gates and baradaris etc.

Islamic Architecture includes rise of Islam, Islamic architecture & its influence. It includes mosques, tombs, forts and their elements like domes, minarets, arches with reference to the

Slave, Khalji, Tughlaq, Sayyid, Lodhis and Shershah Suri regimes and their architecture. The course culminates with Mughal Architecture and includes Evolution of Mughal Architecture with emphasis on Akbar's contribution (Fatehpur Sikri, Humayun's Tomb) and Shah jahan's architecture (Shahajahanabad, Red Fort, Jama Masjid and Taj Mahal).

After completing the course, student will be able understand the purpose of the subject and the implementation of history in today's design. Through this course an architecture student will be able to design with the understanding of past architecture and utilize the concept of designing in advance forms also.

APAR239A	**ENVIRONMENT & CLIMATE**	**C**
		02

OVERVIEW:
To familiarize the students with the climatological aspects associated with the Architectural Design and in turn to the vernacular traditions of Architecture

OBJECTIVES & EXPECTED OUTCOME:

To acquaint students with the concept of climate as a significant determinant of built form. Familiarization of climate control devices

Climatology: Role of climate with respect to shelter and importance of Building climatology, Tropics, climatic zones, macro and micro-climate, Elements of climate and climatology data needed for planning of buildings, change of seasons, distribution of global pressure belts & wind movements.

Human Comfort: Human heat balance and thermal comfort, Thermal stress index, effective temperature and bio climatic analysis, Interrelationship of climatic elements and psychometric chart

Air Temperature: Factors that influence air-temperature – latitude, altitude, seasons, water, trees, areas etc.; thermal conductivity and heat exchange between building and environment, thermal properties of material.

Solar Radiation: Calculation of solar radiation on building surfaces, solar charts; Design and application of shading devices, sun machines and their uses; Opaque building elements and heat transfer through this elements, solar gain factor and sol-air temperature.

Wind: study of diurnal and seasonal variations, heating and cooling, effect of topography: effect of wind on location of industrial areas, airports and other land-uses and road patterns, Air movement in and around buildings, wind eddies, size and position, effect of wind on design and siting of buildings.

Precipitation: Water-vapor. Relative-humidity, condensation, rain, fog, snow and architectural responses.

Day-light: glare, amount of light, sky as a source of light and day-light factor, effect of size and shape of openings in different planes with and without obstructions.

Orientation and Application of Climatic Principles: Siting of buildings with respect of sun, wind and view; Climatic design of indigenous shelters in response to different climatic

zones in India; Use of landscape elements, evaporative cooling, ground cooling, cavity walls, topography; Ventilation of roof spaces and controlled ventilation.

Example of climate-responsive building-projects from India and abroad.

Equip the students with scientific background required to design climate responsive building by offering a clear understanding of various climatic zones and its climate responsive consideration in architectural design of buildings and built-up areas.

APAR225A	**ARTS & GRAPHICS-III**	**C**
		03

OVERVIEW:

This course will help the student for practice of planning and projecting ideas and experiences with visual and textual content. Students create visual concepts, by hand or using computer software, to communicate ideas that inspire, inform

OBJECTIVES & EXPECTED OUTCOME:

- To understand the application of colors & sculpting mediums in Design.
- To improve Aesthetical & Design sense of students.
- Select colors, images, text style, and layout.
- Learn the basic design elements—including line, shape, color, texture, and type—then explores more advanced principles like balance, contrast, rhythm, and white space.
- The flowering of aesthetic sensibilities and a taste for the visual and sensory appeal of physical form.

Students will get to know Art consciousness, Aesthetics, perception, symbolism, expression and style. The students are expected practice extensively with a view to their own personal improvement till a satisfactory standard is achieved.

APAR227A	**COMPUTER APPLICATION IN ARCHITECTURE –I**	**C**
		02

OVERVIEW:

This course will help the student to learn the software programs for draft construction documentation, explore design ideas, visualize concepts through photorealistic renderings, and simulate how a design performs in the real world.

This program will help students to improve the productivity skills and improve their career prospects. Students will benefit greatly from this program and will help them to keep abreast of the latest technology .The students will finish the stages of building design, starting from 2D drawing, 3D modeling and Project management.

OBJECTIVES & EXPECTED OUTCOME:

In earlier stage of students generally draft their designs manually but to improve the productivity skills and improve their career prospects they learn software skill. Students draft their designs such as plan, sections and elevations in Autocad 2D with accurate dimensions and set all drawings in proper scale. In the process of learning 2D drawings students learns some tools and commands include:

Draw Modify Draw orderScale Layout
After making the 2D drawings of buildings students need to develop 3D model to visualize the building in real forms. Autocad 3D includes some commands like extrude, Render etc. through which student can easily improve their visualization skill and improve the form of their design.

After making the 2D drawings of buildings students need to develop 3D model to visualize the building in real forms. Autocad 3D includes some commands like extrude, Render etc. through which student can easily improve their visualization skill and improve the form of their design**.**

APCE 237A	**STRUCTURAL DESIGN –III**	**C**
		02

OVERVIEW:
Structural design-III will provide an understanding about the behavior of different beams used in construction like cantilever beam' T-beam and so on. Students will investigate the behavior of reinforcement in various types of beams design exercises, case studies, and load testing of beams. They will design two way slabs using steel and concrete and gain an appreciation of the importance of structural design today, with an emphasis on environmental impact of large-scale construction.

OBJECTIVES & EXPECTED OUTCOME:
To strengthen the students' knowledge about fundamental structural forces in slabs and beams and the methods of analysis and calculations. To introduce to the forces acting on vertical reinforcement and lateral reinforcement.

Design of Lintels with sunshade-Various cases of Load transfer on lintels Design of Slabs spanning in one direction-Cantilever Chhajja

Reinforced Brick work-Design steps of RBC Determinate & Indeterminate structures

Theory & Design of Doubly Reinforced beams Notations Critical Neutral axis vs. Actual Neutral Axis,Steel beam theory

Flanged beams & T Beams- their theory & design, N.A. of T beam Design of continuous T beams also

Analysis & Design of Reinforcement for a section subjected to torsion also Shear & Torsion, Longitudinal reinforcement, Transverse reinforcement Side face reinforcement

Design of two way slabs with Grashoff Rankine's theory

IS Code 456-1978 method Simply supported Edges fixed & continuous & uniform loading Torsional reinforcement

The course curriculum will make students to calculate load carrying capacity of beams used in the construction practices. This will make students capable enough to design beams, slabs and reinforced brick work for construction purposes.

APCE 233A	**SURVEYING & LEVELLING**	**C**
		01

OVERVIEW:

Surveying & Leveling is the most important discipline which lays down the foundation for all the structures. Surveying & Leveling will enable the students to know, the location and topography of ground which is important for any project. This subject deals with fundamentals of Surveying, Map System, Scale, Linear and Angular measurement, Measurement of area and volume in the field, Chaining, Traversing and contouring. Students will learn about the instrument used in field and their applications

OBJECTIVES & EXPECTED OUTCOME:

The main objective of surveying is to prepare the plan of study area.

Introduction to surveying & Leveling: Definition, principle, terminology related to surveying and its relevance with architecture, types of surveys, Introduction of instruments used in surveying.

Compass surveying: definition, components, bearing and direction, types of compass used and their practical application on traversing.

Contouring: definition, terminology, properties, application

Tacheometric Surveying: Different systems of tachometric measurements -Stadia method &Subtense method.

Photogrammetry: Introduction to aerial survey, terminologies, principle and application to surveying.

The course curriculum will make students understand the fundamentals of surveying & Leveling. Students will be able to handle the instruments learn their application. It will enable the students to understand detailing of the maps which is the pre-requisite for carry out any architectural assignment.

APCE 235A	**SURVEYING & LEVELLING LAB**	**C**
		01

OVERVIEW:

Surveying & Levelling is the most important discipline which lays down the foundation for all the structures. Surveying & Levelling will enable the students to know, the location and

topography of ground which is important for any project. This subject deals with fundamentals of Surveying, Map System, Scale, Linear and Angular measurement, Measurement of area and volume in the field, Chaining, Traversing and contouring. Students will learn about the instrument used in field and their applications.

OBJECTIVES & EXPECTED OUTCOME:

The main objective of surveying is to prepare the plan of study area.Chain Surveying:

Selection of station, methods of taking offsets, Booking the field notes

Compass Surveying:

Traversing using prismatic and surveyor compassLeveling:

Book of the readings and reduction of levels.Plane Tabling:

Equipment and methods used in plane table surveying.Contouring:

Interpretation and preparation of contour maps, Site modeling with total station, Exercises in setting out of building works.

Theodolite Surveying:

Theodolite, its temporary and permanent adjustment, Measuring of magnetic bearings, horizontal & vertical angles, Theodolite traverse and balancing the closing error.

Through this course students will acquire practical knowledge on handling basic survey instruments including Chaining, Compass, Theodolite, Tacheometry, Auto Level, Total Station and will have adequate knowledge to carryout Triangulation, Traversing and general field marking for various architectural projects and Location of site.

SEMESTER IV

APAR 218A	**ARCHITECTURAL DESIGN-III**	**C**
		10

OVERVIEW:

- To foster understanding about land and landforms and the elements of environment of specific regions. Experimentation with shapes, forms & materials to increase sensitivity to built environment and regional characteristics.
- Introduction to Vernacular architecture, use of local materials and appreciation of the socio- economic background of the users.
- Focus on studying patterns in horizontal circulation in built areas.
- Introduction to Bye-laws.

OBJECTIVES & EXPECTED OUTCOMES:

Design projects related to differing climatic conditions:

The projects would address the study of built form and its relationship to the site, surroundings and climatic setting.

The design problem should induce students to experiment with built and open spaces, such that the design proposals address the various issues of climate and physical setting sensibly and show sensitivity to the vernacular features of the site.

Apart from the above mentioned, focus should also be on Functional, geometric and visual order of repetitive units.

Suggested studio exercises:

Creative design of simple buildings such as Community halls, Restaurants, College Canteens, Libraries, Motels, way sides tourist arcades and kiosks, artist's studio

Design of buildings having primarily horizontal circulation and repetitive units such as primary or middle school, post office nursing home, bank, police station etc.

Methodology:

Detailed site analysis to be done at the beginning of each design problem. This would develop sensitivity to existing site conditions and context and help students evolve design directives to guide the design process.

Other design issues that the Design proposals by the students must address are:

- Detailing of selected areas to introduce a working understanding of services.
- Integration of design ideas with structural feasibility.

- Evolving working solutions for human circulation patterns with emphasis on interrelationship of multiuse spaces.
- Proactive approach to vehicular circulation and parking areas.

The design problem should induce students to experiment with built and open spaces, such that the design proposals address the various issues of climate and physical setting sensibly and show sensitivity to the vernacular features of the site

APAR220A	**BUILDING CONSTRUCTION & MATERIALS-IV**	**C**
		05

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.

OBJECTIVES & EXPECTED OUTCOME:

Understanding Construction techniques and methods of detailing different parts of building interiors.

Materials:

- Types of Internal and External Wall finishes.
- Introduction to Paints and Varnishes- manufacturing, types and applications
- Plastics and Adhesives: Thermoplastics, Thermosetting Plastics, Natural Adhesives Like Bituminous etc,

Communication through Drawings

- Partition
- Paneling
- False Ceiling
- Sunken Slab- Toilet and kitchen detail
- Cabinetry

Upon completion of the course, the student shall have acquired the concept of various components of buildings, materials used and methods of construction. The students have acquired knowledge in both conventional as well as vernacular building practices.

APAR232A	**HISTORY OF ARCHITECTURE-III**	**C**
		02

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.

OBJECTIVES & EXPECTED OUTCOMES:

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).

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

The syllabus focuses on the architectural growth and development from the 18th & 19th century in Europe and Indian sub-continent. It includes Renaissance, Baroque, impact of Industrial Revolution in Europe and Colonial Architecture in India.

Renaissance Architecture (Classical Architecture) includes Leaning on Greek & Roman Art & Architecture, Reintroduction of anthropomorphic Classical Orders, Use of elementary geometrical forms and simple mathematical ratios, Study of palazzos & development of centralized church form through specific examples from Italy. Example: St.Peters Church, Dynamism of urban spaces and Study of important villas, churches and urban spaces in Italy.

Baroque architecture includes concepts like Vitality and spatial richness with underlying systematic organization, Sensitivity to effects of texture, color, light and water(Optical illusion) and Study of important urban spaces and churches in Italy and Germany.

Late 18th to early 20th century in Europe includes Industrial revolution and its architectural implications (19th century Neo Classicism, Development of Architecture in Europe-Victorian England e.g Eiffel tower, Crystal palace, Technology of Iron and Steel, Town planning trends in Europe and Influence of Europe in India-Planning of Chandigarh city, India

Within this context, study of Colonial Architecture in India (late 18th to early 20th century) is studied with emphasis on Colonial culture reflecting in the architecture of India, buildings of Kolkata, Goa, Delhi & Mumbai. Portuguese-Goa, Dutch-Coromandel, Malabar, British-

Delhi, Kolkata, Mumbai, French-Pondicherry, Early British Princely Indian Architecture, Birth of Indo Saracenic Architecture and Lutyen's Delhi.

This course will ignite creative thoughts and fuel new imaginations. After completing the course, students will be able to understand the purpose of the subject and the implementation of history in today's design.

APAR222A	**ARTS & GRAPHICS-IV**	**C**
		03

OVERVIEW:

- To introduce the elements of art and aesthetical approaches to the students to know how the creation of architecture does become a cultural activity rather than merely space arrangement for living
- It emphasizes Importance of manual rendering in architecture drawing and how does it enhance students' creativity and precision of defining objects in drawing.
- Introduction to rendering and painting mediums, students practice rendering with various types of rendering and painting mediums such as pen, charcoal, shading pencils, colour pencils and water colours.
- Introduction to Sciography ,it would introduce the technique of rendering light and shadow in architecture drawing as per the four poles and availability of light.
- Human figure drawing and proportion and scale are scientifically taught in the course.

OBJECTIVES & EXPECTED OUTCOMES:

With this practice students can develop their drafting skills that the precision in using scale proportion with certain aesthetical criteria.

How to render three dimensional geometric and irregular forms (architectural) accordingly the proposed architecture design with the effect of reaching of light and geographic features

Development of drafting and designing skills, the precise graphical rendering of plan, elevation, section, and landscape designing in Manuel manner which gives core foundation to students designing capacity.

This subject is a blend of the technique of art and architecture drawing that it teaches the logics of rendering on conventional drawing format, moreover it enables the development of creative and aesthetical vision as a designer.

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 and how this experience can be used in their future designing projects.

Different types of perspective and views are scientifically practicing in the rendering. The logic of perspective and views is the basic apparatus of an architect. Here, the students study how to use different type of markers and drafting pens for rendering, and gain precision in architectural drawing.

APAR224A	**COMPUTER APPLICATION IN ARCHITECTURE –II**	**C**
		02

OVERVIEW:

This course will help the student to learn the software programs for draft construction documentation, explore design ideas, visualize concepts through photorealistic renderings, and simulate how a design performs in the real world.

This program will help students to improve the productivity skills and improve their career prospects. Students will benefit greatly from this program and will help them to keep abreast of the latest technology .The students will finish the stages of building design, starting from 2D drawing, 3D modeling and Project management.

OBJECTIVES & EXPECTED OUTCOMES:

In earlier stage of students generally draft their designs manually but to improve the productivity skills and improve their career prospects they learn software skill. Students draft their designs such as plan, sections and elevations in Autocad 2D with accurate dimensions and set all drawings in proper scale. In the process of learning 2D drawings students learns some tools and commands include:

Draw Modify Draw orderScale Layout

After making the 2D drawings of buildings students need to develop 3D model to visualize the building in real forms. Autocad 3D includes some commands like extrude, Render etc. through which student can easily improve their visualization skill and improve the form of their design.

APCE 228A	STRUCTURAL DESIGN-IV	C 02

OVERVIEW:

Structural Design addresses the process on both at conceptual and a mathematical level. The course curriculum deals with the study of various design aspects of reinforced concrete structure that helps to keep the structure durable, sound and stiff. The students will learn the analysis of indeterminate structures and designing aspects capable of resisting the effects of combined forces.

OBJECTIVES & EXPECTED OUTCOMES:

To understand the analysis of indeterminate structures and their use in construction field.

Design of flat slab: Definition, structural components, conditions under which flat slabs are provided. Theory and design of flat slab with practical examples.

Theory and design of columns: Technical definition, components, forces acting on a column, design provisions, assumptions in the theory of columns and design of long and short columns subjected to varying load with practical examples.

Foundations: Types, components, application and design of various types of foundation using practical examples.

After completing the course, a student will be able to identify indeterminate structures and carry out their analysis for designing purposes. Through this course an architect student will be able to design different structures and utilize the concept of designing fundamental structures in advance forms also.

APCE230A	BUILDING SERVICES-I (WATER SUPPLY & SANITATION)	C 02

OVERVIEW:

To familiarize the students with fundamentals of water supply and drainage in building services & their integration with architectural design.

OBJECTIVES & EXPECTED OUTCOMES:

To equip the students of architecture about the building services related to water supply and building sanitation, so as to enable them to comprehend the subject thoroughly and integrate the learning into architectural design.

Water Supply

- Detailed studies such as Sources and Treatment of water
- Water demand & calculations, Storage & conveyance of water at municipal level
- Water supply systems and various fittings,

- Hot and Cold water supply layouts
- Water supply design of a residence: Connection with water mains, design of Underground & Overhead water tanks, pump capacity, calculations for diameter of pipe
- Introduction to water supply in a multistoried buildingWastewater
- Definition of Refuse, garbage, rubbish, sullage, sub soil water, storm water, night soil,sewagesanitary, domestic & industrial, sewer, sewerage & waste water
- Various drainage & sanitary fixtures & fittings, traps - role of water seal, sizes, materialsand their space requirements, Water efficient and waterless fixtures
- Types of pipes and drains in different materials and their usage, diameter of pipes, slopestandards • Inspection and Intercepting chambers, manholes etc.
- Sewage and Effluent treatment- Innovative and cost effective sanitation concepts e.g.EcoSAN
- Sewage systems for a small project, Wastewater recycling methods e.g. DEWATS etc.
- Introduction to STP's & ETP's, Design calculations of septic tank & soak pit
- Storm water design calculations for roof top & for surface drains, Rainwater Harvesting &Groundwater Recharge
- Exercise: Design a layout for a residence for water supply, drainage, sewage and stormwater
- Zero discharge concepts

After completion of this course the students can pick up an design plumbing and waste disposal both on individual as well as city scale.

SEMESTER V

APAR325A	**ARCHITECTURAL DESIGN-IV**	**C**
		10

OVERVIEW

Design exercise could be any medium sized public building having more than one floor in a non-urban setting. Projects to introduce the concepts of shared open space, clustering, community engagement. Emphasis will also be laid on site planning. The design studio shall be closely integrated with building construction studio. Emphasis shall be laid on clarity of detail and architectural expression in functional and constructional terms.

To inculcate the appreciation of the design process & an understanding of the design complexities and contradictions involved in resolving architectural design problems of Institutional nature.

OBJECTIVES & EXPECTED OUTCOMES

The main objective is to sensitize the students to space-specific contextual factors in designing, the second objective is to sensitize the students to the special needs of the differently able people, suffering from various types of physical limitations, as they negotiate the built environment. The last objective is to enable the students apply theoretical knowledge learnt in the previous semester in architectural design exercise.

The following issues relating to institutional design will be addressed to: Nature of contemporary institutions, correlation to urban structure.

Development control and urban infrastructure affecting design. Various approaches to building in urban context.

Integration of function: movement, climate, acoustics, structure and services into the group of buildings.

Landscaping and site planning

Institutional character from abstract to detail.

User behavior and requirement pertaining to the physically handicapped.

Necessary theoretical inputs to be given highlighting the norms and design issues. The topics not covered as design problems may be covered by the studio faculty members through lecture/slide shows.

The topics to be covered as design problems may include:

Design of Institutional buildings: Schools, colleges with its various learning departments such as medical, engineering, law, business, music and dance colleges, vocational training institutions,

Socio-cultural Centres, Museums, Library, Art galleries, Cultural center, Performing Arts Centre, Industrial Buildings

Adaptive reuse of buildings of a documented building.

Students are expected to understand basic structure forms in relation to space and materials & application of structural forms in design: The outcome of Architectural Design in the earlier semesters were concerned with 'space and form' and 'formal transformations'; 'space and activity'; 'space & regional setting" etc. The continuation of this leads to understanding of architecture as an outcome of 'space and structure'.

APAR331A	**BUILDING CONSTRUCTION & MATERIALS-V**	**C**
		05

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

OBJECTIVES AND EXPECTED OUTCOME

Understanding of Construction techniques in Steel and its components and awareness of the constructional aspects of structural steel and its application in various building components of an industrial building.

Materials:

- Introduction to Glass and types of Glass used for construction-Transparent, Translucent, Glass Bricks etc.
- Introduction to structural steel section and framed construction. Detail studies such as characteristics of structural steel sections and its application as structural members in different part of building.
- Introduction to Ferrous Metals like Iron, Mild Steel etc. and Non-Ferrous Metal like Aluminum etc.
- Introduction to UPVC

Communication through Drawings:

- Door Details in Aluminum and Steel like Revolving Door, Rolling Shutter etc.
- Window Details in Aluminum, Steel & UPVC
- Steel Staircase Detail.

Focus on various building materials and construction techniques would be emphasized based on the performing standards and codes, wherein application of each material would be discussed in detail, both in the context of historical and contemporary methodology. With time, each topic can focus on latest trends in practice and usage of new technology/materials. Emphasis is given on importanceof water and damp proofing in building construction.

APEE321A	**BUILDING SERVICES-II (ELECTRICAL & LIGHTING)**	**C**
		02

OVERVIEW

To familiarize the students with fundamentals of illumination in building services & their integration with architectural design.

OBJECTIVE AND EXPECTED OUTCOME

This course will give basic understanding about the science behind Lighting. It will help students for applying prediction methods to assess the functional requirements of buildings. By learning this course students can provide optimum lighting solutions through simulations and design models. Further this course will expose students to perform basic room lighting measurements.

Electrical:

Introduction to engineering services for buildings

Electrical Services: sources of electrical energy supplied to buildings Electricity generation, transmission and distribution.

Instruments for measurement, metering.

Rules and regulations regarding electrification of buildings as appropriate with relevant standards

Types of electrical wiring system, earthing, scope and requirements Requirements of electrical materials such as conductors, insulators Types and requirements of electrical cables

Control equipments such as switch gear, safety devices to be used in electrical layouts. Electricity Authority, Act, rules and regulations

Illumination & Lighting Design:

Introduction to Illumination, studies of the same such as various types of artificial lighting Various Terms in lighting, standards of illumination for illumination levels,

Types of artificial lighting sources, types of lumniaires & fixtures Comparative efficiency of lighting fixtures

Methods and calculation for lighting design- Inverse Square Law, Cosine Law& Coefficient of Utilization Method, Outdoor lighting, specialized lighting like art galleries.

Graphical symbols electrical systems, Electrical drawing of a small building.

After completion of this course, students will have a better understanding of integration of electrical system with building design and application of indoor and outdoor lighting in appropriate way in building planning and designing.

APAR323A	**COMPUTER APPLICATION IN ARCHITECTURE –III**	**C**
		02

OVERVIEW:

This course will help the student to learn the software programs for draft construction documentation, explore design ideas, visualize concepts through photorealistic renderings, and simulate how a design performs in the real world.

This program will help students to improve the productivity skills and improve their career prospects. Students will benefit greatly from this program and will help them to keep abreast of the latest technology .The students will finish the stages of building design, starting from 2D drawing, 3D modeling and Project management.

OBJECTIVES & EXPECTED OUTCOMES:

Students produce a set of commercial construction drawings including a site plan, floor plans, reflected ceiling plan, sections, elevations, schedules, and details. They apply knowledge of commercial construction materials and processes. Examine structural plans and details for application to the architectural drawings.

Students will be able to:

- Create 2D and 3D models
- Understand advanced modeling tools
- Create Project Details and Schedules

Students will able to visualize the 3D concept of building services and structure ofbuilding.

APCE317A	ESTIMATING, COSTING & SPECIFICATION	C 02

OVERVIEW:

To familiarize the student with the commonly used methods of preparing estimates of Architectural Projects.

OBJECTIVES AND EXPECTED OUTCOME:

This course is intended to impart students with the necessary technical knowledge for preparation of Specifications and calculating estimates and detailed costing for small to medium scale projects

Introduction: Introduction to Quantity estimation, costing and specifications related to building projects. Definition of estimating and costing, Purpose of estimation and costing, Procedure of estimating or method of estimating, data required preparing an estimate (Drawings / specification / rates), completing estimate structure.

Measurement of materials and works Introduction to measurement of various construction work items, importance and significance in construction projects i.e. Units of measurement, rules for measurement, Methods of taking out quantities- Long wall and short wall method, centre line method, partly centre line, cross wall method. Standard modes of measurement as per Indian Standards for various work items.

Types of estimates Preliminary/Approximate Quantity Estimates: Importance & purpose of Preliminary / Approximate estimates, Plinth area method, Cubical contents method and centre line method and their preparation. Types of approximate estimates, basic differences and advantages. Detailed Quantity Estimation: Types of detailed estimates and their application, Methods of deriving detailed quantities for various construction work items.

Preparation of Detailed estimate, Work items as per construction stages: Foundations, Superstructure, Finishing works in a simple building. Description & significance of Items in Bill-of-Quantities (BOQ).

Costing Introduction, meaning, purpose, methods of estimating cost of construction for various work items, cost indices, rates of labour and material, analysis of rates, preparation of abstract of estimated cost, use of CPWD schedule of rates. Deriving construction cost as per BOQ.

Specifications: Introduction, Definition, importance and purpose of specifications, impact on costing. Principles and practices. Types of specifications. Knowledge of manufacturers' specifications for construction materials/products. Specification of common building materials including carriage & stacking of materials. Specifications for a simple building.

Standard specifications of BIS. General abbreviations used in specifications. Specification of new building materials.

This course will train the students to prepare estimates and contracts in construction projects as a part of architectural practice.

APAR329A	**HOUSING**	**C**
		02

OVERVIEW:

Housing policies of the Government of India have come a long way since the 1950s. With the growing population, migration and urbanization housing is becoming acute problem in the society. To overcome this, myriad of housing policies and programs are launched. It is becoming necessary to study and understand the effects and role of these policies in housing sector.

OBJECTIVES AND EXPECTED OUTCOMES:

The course is designed to understand the housing fundamentals, policies programmes, housing process & design. The students will study housing schemes with defined parameters, concepts, definition & components of housing, Role of housing in socio-economic development of nation, Housing Process & sequence of development, Housing need, demand and supply, housing problems and inadequacy etc. This course will also focus on varied housing policies & programmes, housing standards and design and housing finance agencies, obstacles in financing, and banking and non-banking institutions for financing

Students are expected to learn current scenario of the housing sector in India, its post-independence growth and factors affecting it.

APAR333A	**MODERN WORLD ARCHITECTURE**	**C**
		02

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.

OBJECTIVES & EXPECTED OUTCOME

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

Modern architecture includes various modern movements in different parts of the Western world and their role in defining Modern architecture taking examples of Architects (Le Corbusier, FLW, Mies Vanderohe) /Artist and their works.

Introduction to Post Impressionism, Expressionism, Art Nouveau, Surrealism, Abstract Expressionism, Cubism, in Indian Context: Public Works Department (PWD) and its role in the works of Indian Architects, Buildings of New Delhi, Constructivism, DE –Constructivism (Examples of various Architects works), Biomimetic (Gherkin Building, London), Parametricism.

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).

APCE315A	**STRUCTURAL DESIGN –V**	**C**
		02

OVERVIEW

This course deals with the design aspects of a few special structures with a view to simulation of realistic behavior as closely as possible. For each type of structure, the underlying design philosophies will be emphasized along with the procedure. The Indian and international design guidelines for each type of structure will be referred to along with case studies.

The categories of structures which are going to be dealt with in this course are Stair cases, pre-stressed concrete structures, domes, shells and folded plates. This course also helps in the understanding the difference between working stress and limit state methods of structural design.

OBJECTIVES & EXPECTED OUTCOMES

To understand the theories of designing and analysis and design of advanced structures. Theories of designing: fundamentals of limit state of designing and their application to different structures like singly and doubly reinforced beams and L & T beams.

Pre-stressed concrete structures: Theory and concept of pre-stress. Analysis and design of pre-stress concrete structures.

Designing and detailing of staircase: Types, components, application and design of various types of staircase using practical examples.

Design of domes, shells and folded plates: Types, components, application and design of various types of domes, shells and folded plates using practical examples.

This class aims at providing students with a solid background on principles of structural engineering design. Students will be exposed to the theories and concepts of both concrete and steel design and analysis both at the element and system levels. Hands-on design experience and skills will be gained and learned through problem sets and a comprehensive design project. An understanding of real-world open-ended designissues will be developed.

SEMESTER VI

APAR318A	**ARCHITECTURAL DESIGN – V**	**C**
		10

OVERVIEW

 The objectives of Arch. Design in the earlier semesters were concerned with 'space and form' and 'formal transformations'; 'space and activity'; 'space & regional setting" etc.

 The continuation of this leads to understanding of architecture as an outcome of 'space and structure'.

 Understanding basic structure forms in relation to space and materials.

 Application of structure forms in design.

 Understanding of the design complexities and contradictions to resolve architectural design problems for Housing of different typologies and public buildings.

OBJECTIVES & EXPECTED OUTCOME: Design of Mid-rise apartments:

 Issues to be addressed for the design project pertaining to apartment design:

 Density, mixed land use, ground coverage, development controls.

 Type of occupancy, social strata, social status and prevalent social strata

 Urban systems, services and their integration with the project.

 User requirements (derived from surveys)

 Issues in appropriate technology and costs.

 Issues of hierarchy, identity of space, public and private scales of space. Integration of community institutions etc.

 Detailing for the disabled and the elderly.

 Indian / local architectural responses to climate, culture, traditional values, building elements, symbols motifs and special character.

 Details from the dwelling cell to immediate shared space to communal space shall be emphasized and worked out. Socio cultural layer of the occupants shall form a strong fabric in the ultimate weave of the design. Projects shall aim at developing a very sensitive attitude towards micro level human habitation and role of architecture in enhancing or curbing the quality of living.

 Examples of projects: Apartments for IT employees, Govt. servants, teaching faculty, Textile weavers, etc. luxury flats in the center of the city, group housing in the suburbs.

Design of public buildings:

The role of urban space as a public realm and the need to create such spaces as extension of private domain in a public building shall be investigated and shall become one of the architectural goals of the project. Some of the prerequisites of the project shall be;

1. Multiple functions,
2. Public access to majority of the spaces,
3. Large gathering areas which are open and extendable to the immediate urban context.

Examples of projects: Large scale exhibition spaces, Auditorium, Cinema halls, Sports stadium, etc., Detailing of architectural features of the major project like entrance lobby, skylights and staircases has to be attempted.

APAR320A	**BUILDING CONSTRUCTION & MATERIALS-VI**	**C** 05

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 familiarize the student with the system of making detailed RCC drawings required for construction on site and understanding Construction techniques of different components of RCC.

Materials:

- Introduction to RCC, New Structural Forms.
- Methods of execution such as formwork required for Shell Structure, Geodesic Domes etc. and reinforcement brick concrete.
- Technical Case Studies.

Communication through Drawings:

- Types of Glazing e.g. Curtain Glazing and Structural Glazing
- Types of Vaults and Domes.
- Scaffolding
- Retaining Wall
- Waterproofing and its details
- ACP Paneling
- Types of Cladding-Internal and External in Dry and wet cladding & dry-stone cladding details

Upon completion of the course, the student shall have acquired the concept of various components of buildings, materials used and methods of construction. The student have acquired knowledge in both conventional as well as vernacular building practices.

APAR328A	**BUILDING SERVICES-III (ACOUSTICS)**	**C** 02

OVERVIEW

To familiarize the students with fundamentals of acoustics and firefighting in building services & their integration with architectural design

OBJECTIVE AND EXPECTED OUTCOME

This course will give basic understanding about the science behind building acoustics. It will also help students for applying prediction methods to assess the functional requirements of firefighting services in the buildings. By learning this course students can provide optimum acoustical solutions through simulations and design models. Further this course will expose students to perform basic room acoustics measurements.

Acoustics

- Introduction to general principles of sound such as Reverberation, Absorption, Reflection, etc.
- Introduction to Building acoustics with reference to various building types such as studios, auditoriums etc.
- Detailed studies of various types of Acoustical materials and their application.

Firefighting & fire protection

- Causes of fire, reasons for loss of life due to fire, development of fire, fire load, fire hazards
- National Building Code: grading of structural elements due to fire, classification of building types, norms for fire-exit ways and building materials, concept of fire zoning, doorways, stairways, passages and corridors, fire escapes etc.
- Rules for fire protection and firefighting requirements for high-rise buildings in India
- Brief description of characteristics of combustible and noncombustible materials in case of fire

This course will train students to design last assembly spaces like auditorium , concert halls keeping in view the sound quality and disaster mitigation aspects like fire fighting

APAR334A	AIR CONDITIONING & MECHANICAL SERVICES	C 02

OVERVIEW

This course will give the learner an insight into the importance and implementation of mechanical systems used in the functioning of buildings.

How does this happen? The learners are exposed to topics like

- **Human Comfort conditions-** Need for mechanical ventilation in buildings**,** Rate of ventilation for different occupancies, Methods and equipment employed for mechanical ventilation in buildings.
- **Air Conditioning-** Principles of Air-conditioning, Indoor Air Quality, Carnot cycles, gas laws, refrigeration, cycles and refrigerants; Architectural considerations for air conditioned buildings; Definition, advantages and disadvantages, brief introduction to psychrometric process, air-cycle and refrigeration cycle; Summer and winter air-conditioning, calculation of air-conditioning loads, Zoning: purpose and advantages; Air-distribution systems: Ducts and duct systems, Air-outlets, Compressors, condensers, evaporators, heat exchangers, etc.
- **Air-conditioning methods and equipment:** Window units, split units, ductable air conditioners and package system; Central air-conditioning systems: AC plant and room, all air systems and chilled water systems, AHU and FC units, Building ducting, diffusers and grills; Location of air-conditioning equipment in buildings**;** Architectural requirement of various equipment, Residential and commercial air-conditioning, energy conservation techniques; Introduction to the concept of 'Clean Room' and their architectural requirements
- **Elevators (Lifts)** - Brief history-types of Elevators like traction, hydraulic etc. Doubledecker, sky lobby, lift lobby, lift interiors etc, Definition and components; Elevatoring a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc; Types of lifts,

passenger, capsule, hospital lift; goods-lift etc; Working and operation of lifts, parts of lifts; industry standards and capacity calculations; Provision to be made in buildings for installation: location, systems, sizes, equipment, spatial requirement

- **Escalators** - Introduction to working of escalator and design, escalators location, equipment

Why is the above interesting? Through the study it becomes easier to appreciate how buildings can be made more comfortable by adding mechanical systems.

This 'hands on' course attempts to introduce students to the models and methods that describes mechanical services through working videos and case studies, where real problems that exist in the world around us can be studied and even solved.

OBJECTIVE AND EXPECTED OUTCOME

Buildings need to be well equipped with mechanical services for better human comfort in terms of well ventilated spaces and easier vertical transportation. For instance, air conditioning helps in achieving human comfort with better indoor quality. Mechanical vertical transportation systems like elevators and escalators help in easy vertical transportation with lesser effort especially in high rise buildings and public buildings.

Students get to understand the historical background with need and ways of providing the mechanical services in any building.

In addition, students will learn the detailed planning and functioning of these mechanical services inside a building.

This course will ignite creative thoughts and fuel new imaginations. After completing the course, students will be able to plan requirements of air conditioning, lifts and escalators in any building.

APCE332A	**STRUCTURAL DESIGN-VI**	**C** 02

OVERVIEW

Structural design-VI will provide an understanding about the behavior of different types of steel structures and their connections used in construction like riveted, bolted and welded connections. Students will investigate the behavior of connections in various types of steel structures design exercises, case studies, and load testing of connections. Students will design steel beams and tension members 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 steel and the methods of analysis and calculations.To introduce to the forces acting on tension and compression members.

- Structural Properties of steel and use of steel as a structural material.
- Classification of rolled steel sections and their properties.
- Riveted, Bolted & Pinned connection.
- Welded connections.
- Design of Tension members.
- Design of compression members, lacing & bracing
- Analysis and Design of simple Beams & Plated Beams.

The course curriculum will make students load carrying capacity of various connections used in the construction practices. The outcome of the course will make students capable enough to design steel structures for construction purposes.

APAR336A	**TOWN PLANNING**	**C** 02

OVERVIEW

The course intends to introduce the students to the concepts and theories of planning and the relationship between architectural development and its larger context of the town and the history and development of the global trends in planning processes as compared to Indian planning methods, its relevance & application to modern day principles of town planning.

OBJECTIVE & EXPECTED OUTCOME

The course enable the students to understand the issues involved in projects of larger scale and undertake design and planning of projects of a larger scale by defining Town Planning and Regional Planning, role of a town Planner, Elements and planning principal of city plan. It also states the Evolution of town planning in India: pre-independence and post-independence.

To introduce the students to the concepts and theories in urban design Town planning Terminology, Planning Process & Standards. Segregation of land uses and /or segregation of movement routes, civic spaces (squares) in towns and cities their functions, location and organization civic design and city beautiful concepts, sanitation models and byelaw housing-industrial townships and its impact on town planning and architecture concentration problems, suburban sprawls-decentralization green belts-New towns, cities of tomorrow-town planning models and its analysis. Introduction about Professional Bodies in planning profession such as T.C.P.O. and I.T.P.I. etc. will create awareness Various Planning

authorities like D.D.A., CIDCO, HUDA/ HSVP ,etc. Introduction to Local and Self Government in urban as well as rural areas, introduction to 73rd and 74th amendment to the constitution.

The study of Planning Survey and Process deals with Town planning surveys (Physical, social and Economical, Aesthetic Surveys), for physical planning and techniques of Analysis realization of the plan Planning standards, zoning and density control .

Next the Theory of city form: normative models – cosmic, machine, organic; Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory; Ebenezer Howard's Garden City Concept; Radburn Theory (Radburn) and Neighborhood planning to understand various planning theories as it has emerged Historically and in its contemporary manifestation.

The course ends with learning the awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines. The Shapes of plan in accordance to

road networks let the students to develop ability to conduct transportation planning, analysis and evaluation of systems.

And to overcome the challenges they need to learn the new concepts in mass and rapid

transportation systems e.g. BRT, LRT and Metro rail.

With this course in learning students will be able to understand the planning process, theory and practice and its role in planning of cities; appreciate the role of historical developments in planning and its evolution and trace these influences to the current situation; equipped with necessary information on town planning theories, principles, techniques and methodologies. Students will be able to determining and analyzing pattern of Urban Growth and System of Cities and apply UDPFI and TCPO guide lines.

APAR310A	**WORKING DRAWING & BUILDING BYELAWS**	**C** 05

OVERVIEW

This course will help the student develop the ability to develop a thinking process in which they learn how the presentation drawing and technical drawings work together. The course begins with a simple understanding of plan, section and elevation of a building. During the project development students learn how to correlate the architectural drawings and structural drawing with the existing site.

Then the understanding is developed further by the services of building like electrical, plumbing, HVAC and detail drawings like toilet detail, kitchen detail and staircase detail.

The students finish the course by learning the process takes at the time of submission of drawing and the number of drawing issued on the site at the time of construction.

OBJECTIVES AND EXPECTED OUTCOMES

Students generally find the difficulties in making detail drawings of staircases, toilets,

sections and sometimes they also not able coordinate architecture drawings with structure and services. So this course is design to arouse the students with the sense of Study of Building bye laws, National Building Code etc. The students will generate an understanding of making complete set of working Drawings and Details for the residence presented earlier or any other small project. The drawings to also incorporate electrical and plumbing details complete with schedule and all specifications. The Working Drawings and details to include:

- Site plan
- Foundation layout with details of foundations.
- Ground floor Plan.
- First Floor Plan.
- Terrace Plan
- Sections
- Elevations.
- Doors and Windows
- Doors and Windows details
- Electrical Layout in at least one of the two Floors.
- Plumbing Layout in at least one of the two Floors.
- Toilet details complete with all fixtures and their specifications.
- Kitchen details complete with all fixtures and their specifications
- Flooring pattern on either of the two Floors.
- Staircase Details including railings.
- Details of Grills, Parapet or railings.
- Typical wall section showing foundation, DPC, skirting, sill, lintel, slab and terracing details.

SEMESTER VII

APAR419A	**ARCHITECTURAL DESIGN – VI**	**C** 10

OVERVIEW:

To develop design skills for complex service intensive buildings and structural systems.

OBJECTIVES & EXPECTED OUTCOME:

Projects shall be of urban scale with multiple functions and a need for imagery as one of the architectural goals.

Design issues should address the following:

Macro and micro climate

User behavior and requirements Utility and space enhancement Form and function

Circulation: horizontal and vertical. Site Planning and Landscape detailing

Structural details such as beam framing, building services / HVAC etc. Use of innovations in materials and techniques of construction.

Energy efficient design, water conservation and waste recycling

Energy Management systems Lighting and acoustics Communications and security systems

Design detailing considering the barrier free environment

Socio-economic profile of user group

Parking details and standards

Application of energy rating systems viz. LEED, GRIHA

Design of high-rise buildings/services-oriented buildings like Multiplexes; Shopping malls, commercial complexes, 5 star hotels, theme-based hotels, recreational buildings, hospitals, IT centers etc.

Design of transport terminal like airports, bus terminals, railway station, etc.

All portfolios to include two drawings showing construction system and materials, services. Architectural models of various structural forms and important historical buildings should be preserved in the Architecture museums of the college for the use in History of Architecture classes.

APAR421A	BUILDING CONSTRUCTION & MATERIALS-VII	C 05

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 & EXPECTED OUTCOME:

To make the students learn about all the aspects of advanced building construction techniques.

Materials:

- Introduction to cost effective and environment friendly building materials such as Stabilized mud block, Hollow Concrete Blocks, Aerated Concrete Blocks, Fly ash Bricks, Husk Boards etc.
- Introduction to Pre- stressed Concrete Structure, methods of Pre-stressing.
- Introduction to Prefabrication, advantages and disadvantages of on-site and off-site pre- fabrication.
- Introduction to Speedy construction methods and types of Floor Construction.

Communication through Drawings:

- Prefabrication
- Pre-stressed Concrete
- Speedy construction
- Design and Details of Roof Gardens
- Innovative construction techniques by using recyclable materials etc.

The students will have a basic understanding of Pre-stressed Concrete constructional details through workshop/ site visit and students can manifest them into drawings.

APAR431A	PROFESSIONAL PRACTICE AND OFFICE MANAGEMENT	**C** 02

OVERVIEW

This course will give the learner an insight into the various aspects of professional practice and office management in the real world after the completion of the professional course.

How does this happen? The learners are exposed to topics like-

- **IIA-** Professional body involved in promoting the profession of architects- its working constitution and byelaws, categories of membership, election procedures.
- **Architects' Act 1972:** Detail study of the Act, Council of Architecture; procedures of Membership.
- **Scale of charges:** Conditions of engagement of an architect – Duties; Responsibilities and liabilities of a professional architect; Scale of charges, mode of payment etc.
- **Code of Professional conduct:** Clauses governing conduct of professional architect.
- **Architectural Competition:** Types of competitions; need and procedure for conducting competitions.
- **Tender and Contract:** Type of building contracts, their demands. Preparation of tender documents, method of inviting tenders, opening of tenders, preparation of comparative statement, recommendation and award of projects, preparation of contract documents, general conditions of contract, interim certificates, defect liability period, retention amount and virtual completion.
- **Arbitration:** Arbitration, Arbitrator, Umpire, Nature, of arbitration, Appointment, Conduct, Powers, and duties of arbitrators and umpires; Procedure of arbitration and preparation of awards.
- **Office management:** Architectural office, architect, contractor, client relationships, Office correspondence, filing and record keeping, Human resource management.

Why is the above interesting? Through the study it becomes easier to understand various aspects of professional practice which an essential part of an architect's life at some point in life is.

This 'hands on' course attempts to introduce students to the professional practice and office management by practically meeting practicing architects and visit their offices to understand the functioning and management of an architect's office.

OBJECTIVES & EXPECTED OUTCOME:

Students get to understand various aspects of professional practice which an essential part of an architect's life at some point

After completing the course, students will have clear understanding of basic of professional practice and also, it will help students to set up their own office post studies.

APAR425A	**PROJECT CONSTRUCTION MANAGEMENT**	**C** 02

OVERVIEW

This course guides students through fundamental project management concepts and behavioral skills needed to successfully launch, lead, and realize benefits from projects in profit and nonprofit organizations. Successful project managers skillfully manage their resources, schedules, risks, and scope to produce a desired outcome. In this course, students explore project management with a practical, hands-on approach through case studies and class exercises. A key and often overlooked challenge for project managers is the ability to manage without influence—to gain the support of stakeholders and access to resources not directly under their control. Special attention is given to critical success factors required to overcome resistance to change. We will review causes of project failure and how to mitigate risks through proper planning in the early phases of a new initiative.

OBJECTIVES & EXPECTED OUTCOME:

 To establish an understanding of how construction industry operates including the project life cycle and participants involved.

To introduce the principles of project management and its functions.

 To provide the students with essentials of construction management including procurement, planning, estimating, and scheduling.

To familiarize students with measuring and managing performance in construction.

 To present and discuss some tools to improve performance at project and organizational level.

 To increase the awareness of students on the emerging issues and advanced processes in construction

Introduction & definition of Project construction management

Project functions, planning process.

 Project work breakdown, Modeling and analyzing networks and work scheduling process.

 Bar charts and Mile stone charts. Network analysis fundamentals, CPM Network analysis procedure. PERT - Network, Time estimates, Probability Distribution, Critical Path,

Slack and Probability of achieving completion date.

Project cost analysis - Cost versus time, Contracting the Network etc.

- Resource Allocation - Resource Smoothing and Resource Leveling. Updating the network based on the project progress.
- Computer applications in construction management – using MS Projects software for project planning, scheduling and control.

After completing the course, students will have fundamental understanding of project management and also, it will help students to understand the role of an efficient Project Manager.

APAR427A	**SITE PLANNING & LANDSCAPE DESIGN**	**C** 03

OVERVIEW

The courses intend to develop a conceptual understanding of landscape design and site planning principles and skills in integrating landscape design with built environment. Understanding and resolving complex issues at various scales and situations in an urban or rural fabric of residential / commercial/ institutional/ recreational land use and flat / contoured site.

OBJECTIVES & EXPECTED OUTCOME

This course is the first of two courses in the study of landscape design in which we study the Site planning & design. Site analysis with surrounds and site planning for large scale sites.

The first part shall deal with an introductory of recourse so that land can be put to appropriate and efficient use. The second part shall deal at a micro level with emphasis on organization of space, site planning, visual elements etc. The exercises shall include physical design of parks, gardens, urban landscape projects, etc.

As part of the process, a number of skills will be developed including site plan preparation, site and program analysis, conceptualization, master plan drawings and section graphics.

Most class sessions will begin with lectures and demonstrations of the topics we are exploring. There will be time for working on assignments in class and small group interaction with the instructor

Landscape Design process is the focus of this class and we will work to develop creative problem solving skills.

This subject uses instances from world landscape history. Development of landscape through understanding of the natural and cultural factors of the place in spatial and temporal framework.

Studying various landscapes and garden designs from historical perspective study of English Mogul, Japanese gardens, their basic principles and historical, climatologically and

social background in conjunction with the societal processes and corresponding design evolution.

The Indian Context – Understanding attitudes to open space design in India, ancient horticultural practices, various influences in landscape and garden design like that of Mughal, British colonial and the Portuguese.

Planting design at various scales through proper understanding of the role of plant material in improvement of

the environment visually and physically. This is supported by site visits, assignment and design exercises. Natural Design characteristics of Plant Materials and factors influencing choice of plant material for

specific design applications;

- Plant selection from ecological, aesthetic, symbolic, functional point of view.
- Planting for urban and rural roads, parks and open spaces, internal courtyards etc.
- Planting for wild life, land rehabilitation, plants growing in and around water bodies.

Studio work deals with understanding and / or resolving of basic landscape design issues and elements through study of existing landscapes. Studying elements of landscape design, Projects dealing with simple

function areas of smaller scale such as children's play area, parking areas, small plaza and similar urban

situations. Students will work on analytical and design projects of simple function area of smaller scale and produce the work in the form of sheets and a report.

The subject objective is to introduce the students to the discipline of Landscape architecture & its relevance to Architecture; to gain an insight into the changing relationship of human with nature, to develop the understanding of site and site planning.

Upon successful completion of this course, students will be able to:

1. Engage in imaginative inquiry to explore concepts and perspectives in order to develop landscape designs that are site specific.

2. Locate, acquire, evaluate, and apply information in order to prepare landscape base maps, site surveys and site analysis.

3. Identify common native landscape plants and their cultural needs.

4. Prepare base maps from available material and information gathered on site.

5. Develop site surveys and analysis.

6. Design and develop landscape plans that incorporate an understanding of the site, the needs of the user and aesthetic qualities.

APAR513A	**INTERIOR DESIGN**	**C** 03

OVERVIEW

The Course focuses on the principles of interior design and their elements in order to explore the different aspect of design while designing any interior space of a building. The course also gives insight of Vastu- shashtra, an ancient science which describes about cosmic energy and its relationship with Architecture.

OBJECTIVES & EXPECTED OUTCOME

The course is designed to develop an understanding of basic principles and elements of any interior space design and the material used. The idea can be transferred by taking various examples of interior spaces and their design with respect to its layout, furniture, illumination (natural and artificial), plants and used materials and so on. After understanding about the basics of the Interior Design focus shifts to furniture

design and on great masters who have contributed in this area. Students are also exposed to modern trends of interior design with respect to furniture design, color application and automation of fixtures in order to save energy.

One part of the course also focuses on Vastu- shashtra and its integration in interior design.

The course shall include sketching and understanding of various categories of interior spaces, their measured drawings and visit to places of different concepts of interior design.

SEMESTER VIII

APAR402A	**PROFESSIONAL TRAINING**	**C** 18

OVERVIEW

To offer students an opportunity to work in an architect's office and get acquainted with the demands of the profession

OBJECTIVES & EXPECTED OUTCOME

The 100 working days office training exposes students to the processes and challenges of designing in the real world. Students are expected to learn various aspects of the design process including design development, working drawings, presentation drawings, site visits, client and consultant meetings, and Project Management.

The Training Report shall consist of the various drawings, observations, technical graphic data, design, structure, construction methods, services, use of material etc. obtained during the process of training. The building study shall be a critical appraisal of one of the noted buildings designed and supervised by the firm in which the candidate has taken the training. The Building Material Study shall include pertinent data, characteristics and applications of a contemporary building material. The detailing study shall deal with the various aspects of an interesting detail done by the firm, where the candidate has done the training or any other project of interest.

This entire semester will be used for Practical Training which is to be undertaken with an architect registered with the Council of Architecture and should have a minimum professional experience of ten years.

A Practical Training Examination will be conducted at the end of the training period, in which the work done by the trainee will be assessed through a viva voce.

*The student trainees should take prior approval of the Architect's office they intend to join, from the concerned authority in the Department of Architecture.

SEMESTER IX

APAR519A	**DISSERTATION**	**C** 06

OVERVIEW

The subject Dissertation focuses on, research, in the area of Architecture and Allied subjects in order to make students understand about social and technological needs of the era. They start understanding the subject by investigating relevant case studies, data collection and the existing literature which can be from book or web. Then they are expected to present their research/ data orally and graphically. This will help them to improve their analytical and presentation skills.

OBJECTIVES & EXPECTED OUTCOME

This course helps the students to develop their critical thinking in order to make them prepared for final thesis project which they will attend in final year of their degree. The main objectives of the course are to formulate the synopsis. This includes deciding the objectives of the research, its scope, methodology, relevant case studies to be undertaken and finally culminating in, broad requirements of the research. At the end, the students are expected to draw the conclusion which can be same as they thought when started their research work or it can be different.

The submission format for all stages shall be print and digital. The data (conceptual, historical, analytical, and comparative or in any other area related to Architecture & habitat) are required to be presented at all stages during the entire semester.

APAR521A	**URBAN DESIGN**	**C** **10**

OVERVIEW

 For a long time now, professional opinion regarding the structure and density of urban areas has revolved around the misbalanced density between the city core and periphery. With mounting pressures on land as a resource, urban sprawl stretching the limits of the city and consequent problems with urban transportation and environmental degradation. The need of density study and its balance in existing precincts of the city becomes evident. However several issues regarding densification arise immediately.

OBJECTIVES & EXPECTED OUTCOME

 Objectives of the course is to study the prime issues relate to the feasibility of re- development of existing precincts with respect to the environment and urbanism.

 A design challenge to develop strategic framework of development to achieve the balance of uncontrolled growth of density, providing new stock and creating an environmentally sustainable, self-financing development type.

 Students are expected to formulate a vision and a suitable alternative development paradigm.

 Students are also expected to do:

1. Documentation and analysis of urban area.

2. Preparation of detailed site analysis, base map of the study area, figure ground map (nolli), road network & percentage of open green etc.

3. Find out urban issues through detailed site analysis and address them through urban design intervention.

4. Understand the need of the people and propose the development which will amalgamate/ merge with the existing fabric of the area.

APAR407A	**ARCHITECTURAL CONSERVATION**	**C** 03

OVERVIEW

To expose students to the multidisciplinary and interdisciplinary nature of conservation, so as to ensure students develop skills required to function as responsible professionals. This will equip students to develop models of sustainable integrated conservation addressing the complexities of historic buildings, heritage cities and cultural landscapes in India. The course recognizes that integrated and holistic approaches are vital for inclusion of heritage into mainstream development processes.

To familiarize the students with the state of the art techniques in material conservation through exercises that contribute to improved conservation practices and processes on site.

OBJECTIVES & EXPECTED OUTCOME

 Firstly students recognize heritage conservation planning as a professional activity that manages change to historic places and is guided by well-established core principles and practices.

 Students gain sufficient understanding of the principles of land-use law and how that has served as a basis for heritage legislation, to apply heritage principles in conformity with applicable laws and regulations. And they gain a basic-level understanding of the principles of urban and rural planning, so the work in heritage planning can be integrated within the larger community planning framework.

 Students learn the principal international charters, conventions, standards, and guidelines that define heritage doctrine and describe best conservation practice.

 Synthesize the results of historical research, physical investigation, and community

consultation in order to ‘understand the historic place’

Students understand the full range of conservation ‘tools’ and ‘incentives’ available to property owners, in order to use them as means for achieving satisfactory conservation outcomes and make wise decisions with respect to conservation strategies and interventions.

APAR413A	SUSTAINABLE ARCHITECTURE	**C** 03

OVERVIEW

To give exposure to students about the environmental impact of building design and construction. To give emphasis on Principles of sustainable architecture as a means of reducing their impact on buildings & its surroundings and to analyze of a building's phases of construction ("pre-building," "building," and "post-building") & to explore the concepts of Economy of Resources, Life Cycle Design, and Humane Design.

OBJECTIVES & EXPECTED OUTCOME

To familiarize the students with the problems and methods of energy conservation through design of built forms

- Firstly students go through the brief introduction of Sustainable and their basic Definitions, Principles, Challenges and responses & understanding of Millennium Development Goals
- Students understand the culture lifestyle and sustainability – Overview of Indian Culture and Ancient cultures of the world in context of reverence of nature and ecological systems.
- Basic understanding of Definitions and Principles of Sustainable Architecture, Environmental Impact of Buildings
- Understanding of Sustainable design priorities, Cultural and economic aspects, Basics of Lifecycle Design, Selected Examples of sustainable Architecture - Vernacular, Historical and Contemporary (Buildings)
- Students focus on Energy Conservation through design of built forms- passive design strategies for low energy consumption.(Examples of current building projects)
- Giving students a brief Introduction to Low Impact Design Strategies & their available sustainability measuring tools in World and India. (Overview).

Students will have a clear understanding of Global issues and challenges where they can use “sustainability tools & techniques to optimize them in an efficient at macro level also at micro level i.e. Building context.

SEMESTER X

APAR520A	**ARCHITECTURAL THESIS**	**C** 18

OVERVIEW

- To prepare a student to independently handle and present all aspects of an architectural design from its evolution to final solution in totality;
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design;
- To develop in students the ability to handle specific aspects of design relevant to the topic.

OBJECTIVE & EXPECTED OUTCOME

The multiple challenges of 'built environment' offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of intentions give students the choice to select the topic of the thesis from a purely hypothetical to a 'live' programme, as long as the topic can result in tangible 'built environment' solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic's relevance to serve the laid down specific objectives inherent in the philosophy of the institution.

For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution. The Thesis report shall consist of all relevant contextual studies: of user, place and time to enable the formulation of design criteria. The design solution shall be in the form of sheets and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail.

The report, in triplicate, shall be submitted in bound form together with prints/photographs of all the drawings and model.

APAR522A	**SEMINAR**	**C** 04

OVERVIEW

The main objective of the course is to study basic structural system in architecture based on the Modern architecture, which is the synthesis of a series of progressive movements since post-industrial period. It is necessary for students to understand these movements, styles, buildings, construction, and contribution of masters in a wider context.

After consulting with subject teacher, Students should select topic of their interest for research & seminar. Topic should be related to Architecture/ Construction/ Green Building/ Energy saving/ contemporary techniques in architecture.

The study includes the progressive developments of the requirements, architectural character and technological advancements of each period / style.

The analytical study on the topic must include examples and sketches with highlighting the relevant features and emphasize to inculcate the research spirit and awareness of architectural heritage among the students. The course will also include revolutions related to selected topic, stage wise developments & importance in today's date.

OBJECTIVES & EXPECTED OUTCOME

The Sessional work shall comprise of individual work of the student completed under the guidance and supervision of the subject teacher as follows:

1. Journal: Hand written/ printed journal with notes and sketches of relevant examples on the above mentioned syllabus contents

2. Project work: Graphical representation or a model of any relevant topic from the above mentioned syllabus contents

 Individual students should present his work/Seminar on selected topic in front of whole class.

By the end of the semester, students are expected to submit a report of approximately 1000words. Students must adhere to Standard referencing conventions and technical writing norms.