K.R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

SCHOOL OF ARCHITECTURE & DESIGN (SOAD)

BACHELOR OF ARCHITECTURE

B. Arch

Programme Code: 16

2021-26

Approved in the 26th Meeting of Academic Council Held on 11 August 2021

Member Secretary

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/ 10 Semesters
Session : 2021-2026

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. P. Prakash, Vice Chancellor, K.R. Mangalam University and Prof. Pushplata Tripathi, 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. Manika Gupta, 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

Vice Chancellor

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 KRM have been continuously upgraded to optimize opportunities for the students. Our students are groomed in a truly inter-disciplinary environment where in they develop integrative skills through interaction with students from engineering, social sciences, management and other study streams.

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

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

K. R. Mangalam University Is Unique Because of Its

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 & Design (SOAD) 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,
iii. Bachelor of Design (B. Des.) : 4 year programme,
iv. B. A (Fashion Design) : 3 year programme.

3.1. School Vision

The School aspires to become a leading Architecture and Design 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 Design 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	8	30
Semester II	9	30
Semester III	10	30
Semester IV	8	28
Semester V	8	27
Semester VI	8	30
Semester VII	6	25
Semester VIII	1	18
Semester IX	4	22
Semester X	2	22
Total	64	**262**

5.7.2. Course Structure for B.Arch Programme

SEMESTER I				
S.no		**Course Code**	**Course Title**	**Credits**
1	PC	APAR117B	Basic Design & Creative Workshop	8
2	BS & AE	APAR119B	Building Construction & Materials-I	4
3	PC	APAR129A	History Of Culture & Civilisation	2
4	PC	APAR123B	Architectural Drawing-I	4
5	BS & AE	APCE113A	Structural Design-I	2
6	OE	UCES125A	Environmental Studies	3
7	OE		Open Elective	4
8	OE	UCDM301	Disaster Management	3
			Total	**30**

SEMESTER II				
S.no		**Course Code**	**Course Title**	**Credits**
1	PC	APAR118B	Architectural Design-I	8
2	BS & AE	APAR120B	Building Construction & Materials-II	4
3	PE	APAR128A	Theory Of Design	2
4	PC	APAR124B	Architectural Drawing-II	4
5	SEC	APAR126A	Workshop	2
6	BS & AE	APCE114A	Structural Design-II	2
7	PC	APAR130B	Early European Architecture	2
8	PC	APAR132B	Arts & Graphics-I	3
9	SEC	APAR471A	Professional Communication	3
			Total	**30**

SEMESTER III				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR217A	Architectural Design-II	10
2	BS & AE	APAR219A	Building Construction & Materials-III	5
3	PC	APAR241B	Indian Architectural History	2
4	BS & AE	APAR239A	Environment & Climate	2
5	PC	APAR225B	Arts & Graphics-II	3
6	SEC	APAR227B	Computer Application In Architecture-I	2
7	BS & AE	APCE237A	Structural Design-III	2
8	BS & AE	APCE233A	Surveying & Levelling	1
9	BS & AE	APCE235A	Surveying & Levelling Lab	1
10	PE	APAR245A	Architectural Photography	2
			Total	**30**

SEMESTER IV				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR218A	Architectural Design-III	10
2	BS & AE	APAR220A	Building Construction & Materials-IV	5
3	PC	APAR232B	Renaissance To Industrial Revolution	2
4	PC	APAR222B	Arts & Graphics-III	3
5	SEC	APAR224B	Computer Application In Architecture-II	2
6	BS & AE	APCE228A	Structural Design-IV	2
7	BS & AE	APCE230A	Building Services-I (Water Supply & Sanitation)	2
8	PE	APAR244A	Art & Architecture Appreciation	2
			Total	**28**

SEMESTER V				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR325A	Architectural Design -IV	10
2	BS & AE	APAR331A	Building Construction & Materials-V	5
3	PC	APAR333B	Modern World Architecture	2
4	PE	APAR329A	Housing	2
5	SEC	APAR323B	Computer Application In Architecture-III	2
6	BS & AE	APCE315A	Structural Design-V	2
7	PC	APCE317A	Estimating, Costing & Specifications	2
8	BS & AE	APEE321A	Building Services-II (Electrical & Lighting)	2
			Total	**27**

SEMESTER VI				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR318A	Architectural Design-V	10
2	BS & AE	APAR320A	Building Construction & Materials-VI	5
3	PE	APAR336A	Town Planning	2
4	PC	APAR310A	Working Drawing & Building Byelaws	5
5	BS & AE	APCE332A	Structural Design-VI	2
6	BS &A E	APAR328A	Building Services-III (Acoustics)	2
7	BS & AE	APAR334A	Air Conditioning & Mechanical Services	2
8	PE	APAR338A	Human Settlement	2
			Total	**30**

SEMESTER VII				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR419A	Architectural Design -VI	10
2	BS & AE	APAR421A	Building Construction & Materials-VII	5
3	PAECC	APAR431A	Professional Practice & Office Management	2
4	PAECC	APAR425A	Project Construction Management	2
5	PE	APAR427A	Elective-I	3
6	PE	APAR513A/ APAR519A	Elective-II	3
			Total	**25**

SEMESTER VIII				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PAECC	APAR402A	Professional Training	18
			Total	**18**

SEMESTER IX				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR519A	Dissertation	6
2	PC	APAR521A	Urban Design	10
3	PE	APAR407A	Elective-III	3
4	PE	APAR413A/ APAR523A	Elective-IV	3
			Total	**22**

SEMESTER X				
S.no.		**Course Code**	**Course Title**	**Credits**
1	PC	APAR520A	Architectural Thesis	18
2	PAECC	APAR522B	Seminar	4
			Total	**22**

LIST OF ELECTIVES			
S.no.	**Course Code**	**Course Title**	**Credits**
1	APAR128A	Theory Of Design	3
2	APAR243A	Disaster Management	3
3	APAR245A	Architectural Photography	2
4	APAR244A	Art & Architecture Appreciation	3
5	APAR338A	Human Settlement	3
6	APAR407A	Architectural Conservation	3
7	APAR427A	Site Planning & Landscape Design	3
8	APAR411A	Art Movements & Architecture	3
9	APAR413A	Sustainable Architecture	3
10	APAR415A	Intelligent Buildings	3
11	APAR433A	Visual Arts	3
12	APAR507A	Low Cost Construction Technology	3
13	APAR509A	Water Resource Management	3
14	APAR511A	Integrated Waste Management & Technology	3
15	APAR513A	Interior Design	3
16	APAR515A	Vernacular Architecture	3
17	APAR517A	Structural Systems	3
18	APAR523A	Parametric Design	3

CATEGORIZATION BY COA		% rqd	Cr Rqd	Cr Acd	%Acd				% rqd	Cr Rqd	Cr Acd	% Acd
PC	PROFESSIONAL CORE COURSES	50	132	134	51		PAEC	PROF. ABILITY ENHANCEMENT COURSES	15	39.5	37	14.1
BS & AE	BUILDING SCIENCES AND APPLIED ENGINEERING	20	53	58	22		PAECC	PROFESSIONAL ABILITY ENHANCEMENT COMPULSORY COURSES	10	26.3	26	9.89
EC	ELECTIVE COURSES	15	39	34	13		SEC	SKILL ENHANCEMENT COURSES	5	13.2	11	4
PE	PROFESSIONAL ELECTIVE	10	26	24	9							
OE	OPEN ELECTIVE	5	13	10	4			TOTAL	100	263	263	100

6. DETAILED SYLLABUS

SEMESTER I

APAR117B	BASIC DESIGN & CREATIVE WORKSHOP	L	T	P	S	C
Version 1.0		**0**	**0**	**0**	**8**	**8**
Pre-requisites/Exposure	Designing					
Co-requisites	Creativity					

Course Objectives

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.

Course Outcomes

CO1. Sensitize the students about basics of design with the help of observation, sketching and model making.
CO2. Able to articulate ideas and develop skills to communicate them.
CO3. Able to appreciate design in nature and surroundings.
CO4. Enhance perception and understanding of Design through exercises based on elements of design and its principles.
CO5. Able to appreciate and understand design applying design principles.
CO6. Understand planes, lines, 3Dimensional objects, form and the spaces.
CO7. Able to create value by applying learnings in creating basic objects of design.

Catalog Description

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.

Course Content

UNIT I
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.

UNIT II
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.

UNIT III
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.

UNIT IV
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 fibre etc.

Text Books:

Ching, Francis D. K., "Architecture: Form, Space, and Order", Wiley and Sons

Reference Books:

Wallschlaeger, C and Snyder, S.B., "Basic Visual Concepts and Principles for Artists, Architects and Designers", McGraw Hill.
Laseau, P, "Graphic Thinking For Architects and Designers", John Wiley and Sons

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Sensitize the students about basics of design with the help of observation, sketching and model making.	PO2, PSO1
CO2	Able to articulate ideas and develop skills to communicate them.	PO6
CO3	Able to appreciate design in nature and surroundings.	PO3
CO4	Enhance perception and understanding of Design through exercises based on elements of design and its principles.	PO3,PO4
CO5	Able to appreciate and understand design applying design principles.	PO3
CO6	Understand planes, lines, 3Dimensional objects, form and the spaces.	PO1
CO7	Able to create value by applying learnings in creating basic objects of design.	PO2

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**							**3**				
CO2		**3**							**1**			
CO3			**3**							**3**		
CO4				**2**							**2**	
CO5					**1**							**2**
CO6						**2**						
CO7							**3**					
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR119B	**BUILDING CONSTRUCTION AND MATERIALS -I**	**L**	**T**	**P**	**S**	**C**
Version 2.0		**0**	**0**	**0**	**4**	**4**
Pre-requisites/Exposure	Detailing					
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.					

Course Objectives

1. To develop the understanding about elementary building materials & their applications.
2. Properties of materials such as physical properties, structural strength, thermal & acoustical behaviour - direct & indirect insulation, reflection and emission.

Course Outcomes

CO1. To develop the understanding about elementary building materials & their applications.

CO2. To develop the understanding about elementary building materials & their applications.

CO3. Understanding direct & indirect insulation, reflection and emission.

CO4. 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.

Catalog Description

To introduce to about elementary building materials & their applications.

Course Content

UNIT I
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.

UNIT II
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.

UNIT III
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.

UNIT IV
Organic Designs:
Appreciation of design through various organic forms in nature & various design principles they exhibit. Introduction to Biomimicry.
To be followed by exercises to create organic forms using clay, Plaster of Paris, Metal scrap, Jute fiber etc.

Text Books:
Ching, Francis D. K., "Architecture: Form, Space, and Order", Wiley and Sons

Reference Books:
Wallschlaeger, C and Snyder, S.B., "Basic Visual Concepts and Principles for Artists, Architects and Designers", McGraw Hill.
Laseau, P, "Graphic Thinking For Architects and Designers", John Wiley and Sons

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To develop the understanding about elementary building materials & their applications.	PO1,PO2
CO2	To develop the understanding about elementary building materials & their applications.	PO2, PO3
CO3	Understanding direct & indirect insulation, reflection and emission.	PO2,P04
CO4	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	PO6, PO7

Programme and Course Mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	**3**		**2**	**3**		**3**	**3**		**3**		**2**		
CO2	**3**	**3**		**2**							**3**	**2**	
CO3			**3**		**2**		**3**		**3**				
CO4	**3**		**3**										**3**
CO5													
CO6													
CO7													

1=lightly mapped 2= moderately mapped 3=strongly mapped

APAR129B	HISTORY OF CULTURE & CIVILIZATION	L	T	P	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Historical study				
Co-requisites	Observation and Understanding of cultural conditions and built form.				

Course Objectives

1. To generate an understanding about the development of civilizations and its impact on contemporary architecture.
2. Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.
3. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand architecture of the period as a solution to the need or demands of the society.

CO2. Understanding the development of civilizations and its impact on contemporary architecture.

CO3. Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.

Catalog Description

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.

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.

The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students are introduced to a chronological study of world architecture starting with development of civilizations to contemporary times. 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).

Course Content

Unit I: 8 lectures

Primitive Beginnings:

-Introduction to History and Architecture with special emphasis on Stone Age to Neolithic settlements in India, examples from Carnac, Bhibeteka & Stonehenge.

Birth of Civilizations:
-In reference to the Asia-minor region with nascent cities like Jericho, Catalhayuk, and Hattasus etc.
Indus Valley Civilization:
-Particularly in reference to the town planning principles exemplified with examples from Mohenjo-Daro and Harappa.

Unit II: 8 lectures
The Vedic / Aryan civilization:
-With its emphasis on the Vedic town plan, its motifs and patterns.
Mesopotamian Civilization:
-With special attention to cities of Mesopotamian like Ninveh, Khorsahbad, Marie, Babylon, and architectural constructs like Ziggurat.

Unit III: 8 lectures
Egyptian Civilization:
-Particularly in reference to social & political context of Tomb Architecture and Temple Architecture with examples.

Unit IV: 8 hours
Aegean civilization:
-Characteristic features of Aegean and Helladic architecture, with special reference to cities like Troy, Sparta and Mycenae, which formed the basis of Greek civilization.

Greek & Roman civilization:
-Evolution of Greek and Roman architecture- factors affecting development
-Hellenic and Hellenistic periods; Etruscan architecture and the Roman period, just the civilization and the cities of Romans & Greeks.
-Brief introduction to Architecture, the classical orders & the advancements in construction techniques of the Romans (vaults & domes & stucco) will be taken up in detail in Early European Architecture.

Text Books

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press
2. Hiraskar, G.K., "The Great Ages of World Architecture (with Introduction to Landscape Architecture)", Dhanpat Rai Publications (P) Ltd.

Reference Books/Materials

1. Risebero, Bill, " The Story of Western Architecture", MIT Press
2. Ching Francis D.K., Jarzombek, Mark M., Prakash, Vikramaditya, "A Global History of Architecture", Wiley

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand architecture of the period as a solution to the need or demands of the society.	PO1, PO3
CO2	Understand the development of civilizations and its impact on contemporary architecture.	PO3
CO3	Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.	PO4, PO7

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1			**3**									
CO2							**2**		**1**			
CO3			**2**	**3**								**2**
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR123B	**ARCHITECTURAL DRAWING-I**	**L**	**T**	**P**	**S**	**C**
Version 2.0		**0**	**0**	**0**	**4**	**4**
Pre-requisites/Exposure	Visualization & coherent thinking					
Co-requisites	Drawing skills					

Course Objectives

1. To understand fundamental techniques of Visual representation.
2. To equip with the basic principles of Drawing.
3. To enhance and develop a graphical language of architecture.
4. To familiarize the students with lettering technique.

Course Outcomes

On successful completion of this course, the students have capability to
CO1. Translate ideas into drawings.
CO2. Develop lettering style as per choice.
CO3. Develop intellectual potential and learning capacity.

CO4. Be able to make plans, sections, and elevations to scale, with the help of drawing instruments.

Catalog Description

The course gives insight about graphical representation of visualized design. It starts with understanding the basic tools, techniques of drafting and meaning of basic symbols of drawing. Also, emphasis given on development of own writing/lettering style to make it more unique and interesting.

Course Content

1. Brief introduction of drafting instruments & their use.
2. Understanding freehand architectural lettering & sheet layout.
3. Understanding about elements to drawing like. Point, line, plane, volume
4. Fundamentals of scale.
5. understanding the representation of actual object in the drawing to the scale (suggestive exercise- On a sheet, an object could be drawn on various scales and can be dimensioned)
6. visualizing an object with the help of Orthographic projection with case specific as axis perpendicular to the H.P. & V.P. (Suggestive exercise -Drafting of 3D composition in Plan and elevation)
7. Understanding geometry of solid objects.
8. Understanding Section of solids with respect to specific case scenarios.
9. Understanding Plan, section and Elevation with respect to the various line weight, for drafting purpose.

Text Books:

1. Engineering Drawing, N.D. Bhatt.
2. Engineering Drawing, R.K Dhawan

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Translate ideas into drawings.	PO2, PSO1
CO2	Develop lettering style as per choice.	PO7
CO3	Develop intellectual potential and learning capacity.	PO1, PO3, PO4, PSO3

CO4	Be able to make plans, sections, and elevations to scale, with the help of drawing instruments.	PSO2,PSO5

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1		**3**										
CO2		**3**										
CO3			**3**									
CO4		**3**					**2**	**2**				
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APCE113A	**STRUCTURAL DESIGN-I**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Observation and Interest in the subject				
Co-requisites	Retain a strong grasp of basic fundamentals and critical thinking skills that enable them to consistently and successfully apply Structural Engineering principles within their chosen career path.				

Course Objectives

1. To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.
2. To advance the architectural profession by integrating engineering mechanics theories, computational modelling simulations, experimental testing observations, and practical design concepts.
3. To understand the factors that help in the manifestation of architecture in different parts of the world.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.
CO2. To understand the Composition & Resolution of Forces
CO3. To understand Equilibrium of Forces and to understand Support Reactions
CO4. To understand Centroid & Centre of Gravity & Moment of Inertia

Catalog Description

This course provides an ability to identify, formulate, and solve complex architectural problems by applying principles of engineering, science, and mathematics.
The course is designed to arouse in the student an ability to recognize ethical and professional responsibilities in architectural situations and make informed judgments, which must

consider the impact of architectural solutions in global, economic, environmental, and societal contexts.

Course Content

UNIT I: 8 lectures
- Force & its units
- Laws of forces
- Resultant of a force system – Analytical, Method of resolution, Triangle Law, Polygon law, Graphical (Vector) method
- Moment of force – Varignon's principle,
- Couple - Moment & Arm of a couple
- Equilibrium of Forces:
- Principles of equilibrium
- Analytical & Graphical method for equilibrium of forces
- Free body diagram
- Conditions of equilibrium
- Types of equilibrium

UNIT II: 8 lectures
- Centroid & Centre of Gravity:
- Definition, Centroid and Centre of Gravity
- Relationship between C.G., Centre of Mass and Centroid.
- Centroid of a Line
- Methods of finding out C.G. & Centroid of plane figures; Symmetrical sections, unsymmetrical sections, solids by different methods – Geometrical, By moments, & Graphical method.

UNIT III: 8 lectures
- Moment of Inertia:
- Definition & important theorems – Parallel axis & perpendicular axis theorem.
- Section modulus
- Radius of Gyration
- MI of plane lamina
- MI of Composite sections.

UNIT IV: 8 lectures
- Support Reactions
- Types of loading – point load, uniformly distributed load, uniformly varying load.
- Methods for reaction of beams or frames and trusses i.e Analytical, Graphical, by Space diagram & Vector diagram
- Types of end supports of beams & frames – simple supported, Hinged, Overhanging beams
- Beams subjected to Moments
- Statically Determinate Structure

Text book [TB]:

1. Applied Mechanics by R.S. Khurmi, S.chand Publications.

2. Structure Mechanics for Architects by Prof. Harbhajan Singh, Abhishek Publications, Chandigarh.
3. Strength of Materials by S.Ramamrutham, Dhanpat Rai & Sons, New Delhi.Mechanics of Materials by Dr. B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications (P) Ltd., New Delhi
4. Mechanics for Engineers, Statics, Ferdinand P. Beer & E. Russell Johnston, Jr. Mc.Graw Hill, International Student Edition.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.	PO1, PSO2
CO2	To understand the Composition & Resolution of Forces.	PO1, PO3
CO3	To understand Equilibrium of Forces and to understand Support Reactions	PO1, PO3
CO4	To understand Centroid & Centre of Gravity & Moment of Inertia.	PO1 ,PO4

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	**1**						**2**		**3**			
CO2									**2**			
CO3									**2**			
CO4			**3**						**2**		**1**	
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped						3=strongly mapped			

UCES125A	ENVIRONMENTAL STUDIES	L	T	P	S	C
Version 1.0		3	0	0	0	3
Pre-requisites/Exposure	Basics of Environment					
Co-requisites	Logical thinking					

Course Objectives:

1. To aware the students about the environment.
2. To learn the students concepts and methods from ecological and physical sciences and their application in environmental problem solving.
3. To think across and beyond existing disciplinary boundaries, mindful of the diverse forms of knowledge and experience that arise from human interactions with the world around them.
4. Communicate clearly and competently matters of environmental concern and understanding to a variety of audiences in appropriate forms.

Course Outcomes:

On completion of this course, the students will be able to

CO1. To comprehend and become responsive regarding environmental issues.
CO2. 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.
CO3. Enable the students to discuss their concern at national and international level with respect to formulate protection acts and sustainable developments policies.
CO4. To know that the rapid industrialization, crazy consumerism and over-exploitation of natural resources have resulted in degradation of earth at all levels.
CO5. Become consciousness about healthy and safe environment.

Catalogue Description

This course imparts the basic concepts of environment which enable them to solve basic problems related to their surroundings. This course helps them to get an idea adverse effect of industrialization, population and degradation of natural resources on the environment. The course introduces the concepts of renewable and non-renewable resources.

Course Content

UNIT I 8 Lectures

Environment and Natural Resources:
Multidisciplinary nature of environmental sciences; Scope and importance; Need for public awareness.
Land resources; land use change; Land degradation, soil erosion and desertification.
Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
Energy resources: Renewable and non- renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

UNIT II 16 Lectures

Ecosystems and Biodiversity:
Ecosystem: Definition and Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession.
Case studies of the following ecosystems:
a) Forest ecosystem
b) Grassland ecosystem
c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots ; India as a mega-biodiversity nation; Endangered and endemic species of India; Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity; Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

UNIT III 15 Lectures

Environmental Pollution and Environmental Policies:
Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution Nuclear hazards and human health risks; Solid waste management: Control measures of urban and industrial waste; Pollution case studies.
Sustainability and sustainable development; Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture; Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

UNIT IV 11 Lectures

Human Communities and the Environment and Field work:
Human population growth: Impacts on environment, human health and welfare; Resettlement and rehabilitation of project affected persons; case studies; Disaster management: floods, earthquake, cyclones and landslides; Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan; Environmental ethics: Role of Indian and other religions and cultures in evironmental conservation; Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).
Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
Study of common plants, insects, birds and basic principles of identification.
Study of simple ecosystems-pond, river, Delhi Ridge, etc.

Text Books

1. Kaushik and Kaushik, Environmental Studies, New Age International Publishers (P) Ltd. New Delhi.

Reference Books/Materials

1. A.K. De, Environmental Chemistry, New Age International Publishers (P) Ltd. New Delhi.
2. S.E. Manahan, Environmental Chemistry, CRC Press.
3. S.S Dara and D.D. Mishra, Environmental Chemistry and Pollution Control, S.Chand & Company Ltd, New Delhi.
4. R. Gadi, S. Rattan, S. Mohapatra, Environmental Studies Kataria Publishers, New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Quiz I	Quiz II	Mid Term Exam	Presentation/ Assignment/ etc.	End Term Exam
Weightage (%)	10	10	20	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	The learners will be able to comprehend and become responsive regarding environmental issues.	PO6
CO2	Students 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.	PO10
CO3	It enables the students to discuss their concern at national and international level with respect to formulate protection acts and sustainable developments policies.	PO8
CO4	Students come to know that the rapid industrialization, crazy consumerism and over-exploitation of natural resources have resulted in degradation of earth at all levels.	PO9

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1							**3**					
CO2			**2**									
CO3												
CO4							**3**					**2**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

UCDM301A	DISASTER MANAGEMENT	L	T	P	S	C
Version 1.0		**3**	**0**	**0**	**0**	**3**
Pre-requisites/Exposure	Basic disaster management strategies					
Co-requisites	Logical thinking					

Course Objective:

1. To create awareness about various types of disasters.
2. To educate the learners about basic disaster management strategies.
3. To examines disaster profile of our country and illustrates the role played by various governmental and non- governmental organizations in its effective management.
4. To acquaints learners with the existing legal framework for disaster management.

Course Outcomes:

On completion of this course, the students will be able to

CO1. Provide students an exposure to disasters, their significance, and types.

CO2. Ensure that the students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.

CO3. Provide the students a preliminary understanding of approaches of Disaster Risk Reduction (DRR)

CO4. Develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

Course Content

UNIT I 8 lecture hours

- Introduction to Disasters: Concept and definitions- Disaster, Hazard, vulnerability, resilience, risks.
- Different Types of Disaster: Causes, effects and practical examples for all disasters.
- Natural Disaster: such as Flood, Cyclone, Earthquakes, Landslides etc
- Man-made Disaster: such as Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc.

UNIT- II 7 lecture hours

- Disaster Preparedness and Response Preparedness
- Disaster Preparedness: Concept and Nature
- Disaster Preparedness Plan
- Prediction, Early Warnings and Safety Measures of Disaster.
- Role of Information, Education, Communication, and Training, Role of Government, International and NGO Bodies.
- Role of IT in Disaster Preparedness
- Role of Engineers on Disaster Management.
- Relief and Recovery
- Medical Health Response to Different Disasters

UNIT III 7 lecture hours

- Rehabilitation, Reconstruction and Recovery
- Reconstruction and Rehabilitation as a Means of Development.
- Damage Assessment
- Post Disaster effects and Remedial Measures.
- Creation of Long-term Job Opportunities and Livelihood Options,
- Disaster Resistant House Construction
- Sanitation and Hygiene
- Education and Awareness,
- Dealing with Victims' Psychology,
- Long-term Counter Disaster Planning
- Role of Educational Institute.

UNIT IV 8 lecture hours

- Disaster Management in India
- Disaster Management Act, 2005:
- Disaster management framework in India before and after Disaster Management Act, 2005, National Level Nodal Agencies, National Disaster Management Authority
- Liability for Mass Disaster
- Statutory liability
- Contractual liability
- Tortious liability
- Criminal liability
- Measure of damages
- Epidemics Diseases Act, 1897: Main provisions, loopholes.

Project Work: The project/ field work is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived based on the geographic location and hazard profile of the region where the institute is located.

Reference Books:

1. Government of India, Department of Environment, Management of Hazardous Substances Control
2. Act and Structure and Functions of Authority Created Thereunder.
3. Indian Chemical Manufacturers' Association & Loss Prevention Society of India, Proceedings of the National Seminar on Safety in Road Transportation of Hazardous Materials: (1986).
4. Author Title Publication Dr. Mrinalini Pandey Disaster Management Wiley India Pvt. Ltd.
5. Tushar Bhattacharya Disaster Science and Management McGraw Hill Education (India) Pvt. Ltd.
6. Jagbir Singh Disaster Management: Future Challenges and Opportunities K W Publishers Pvt. Ltd.
7. J. P. Singhal Disaster Management Laxmi Publications.
8. Shailesh Shukla, Shamna Hussain Biodiversity, Environment and Disaster Management Unique Publications
9. C. K. Rajan, Navale Pandharinath Earth and Atmospheric Disaster Management: Nature and Manmade B S Publication

10. Indian law Institute (Upendra Baxi and Thomas Paul (ed.), Mass Disasters and Multinational Liability: The Bhopal Case (1986)
11. Indian Law Institute, Upendra Baxi (ed.), Environment Protection Act: An Agenda for Implementation (1987)
12. Asian Regional Exchange for Prof. Baxi., Nothing to Lose But our Lives: Empowerment to Oppose
13. Industrial Hazards in a Transnational world (1989)
14. Gurudip Singh, Environmental Law: International and National Perspectives (1995), Lawman (India) Pvt. Ltd.
15. Leela Krishnan, P, The Environmental Law in India, Chapters VIII, IX and X (1999), Butterworths, New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination, Examination Scheme:

Components	Quiz I	Quiz II	Mid Term Exam	Presentation/ Assignment/ etc.	End Term Exam
Weightage (%)	10	10	20	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Provide students an exposure to disasters, their significance, and types.	PO1
CO2	Ensure that the students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.	PO7
CO3	Provide the students a preliminary understanding of approaches of Disaster Risk Reduction (DRR)	PO5
CO4	Develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.	PO10

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	**1**		**2**									
CO2			**2**						**1**			
CO3			**2**									**2**
CO4				**3**			**2**					
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

OPEN ELECTIVE (OE)

Courses approved by the Institution or University from subjects of study other than Architecture which will add value to the course and enable the overall development of the student.

SEMESTER II

APAR118B	ARCHITECTURAL DESIGN-I	L	T	P	S	C
Version 1.0		0	0	0	8	8
Pre-requisites/Exposure	Designing					
Co-requisites	Creativity					

Course Objectives

1. To understand human dimensions and their functions, space-activity by study of Anthropometrics.
2. Focus on studying patterns in horizontal circulation in built areas.
3. To understand about land and landforms and the elements of environment of specific regions.
4. To experiment with shapes, forms & materials to increase sensitivity towards built environment and regional characteristics.

Course Outcomes

CO1. Understand human dimensions and their functions, space-activity by study of Anthropometrics.
CO2. Learning basic understanding of form and space in architecture
CO3. Understand activities in different spaces and various elements of it
CO4. Learn by intense site analysis a better comprehension towards solution.

Catalog Description

Introduction to basic design and the basic understanding of form and space in architecture. On completion of the course student will have fair idea about scale and measurements of single activity and multiple activity spaces, of beginner difficulty level involving primarily horizontal circulation

Course Content

To Study Anthropometrics to understand human dimensions and their functions, space-activity, relationships, measured drawings of simple living units.
To study Scale in Architecture to increase perception and sensitivity of the students about space in terms of balance & proportions.
This can be best understood through one or two short exercises of studying and measuring the interior layout of personal space for living, eating, sleeping, cooking, toilets, laundry area, outdoor sitting spaces such as verandah, balcony etc.
Suggestive mode of work-The studio work can be divided in stages
Prototype study, Problem identification, Site analysis (if needed), Preliminary sketch etc. Models of the final design necessary for greater comprehension.
Design of mono-cellular-units/structures -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.

Text Books:

1. Ching, Francis D. K., "Architecture: Form, Space, and Order", Wiley and Sons

Reference Books:

1. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill
2. Wallschlaeger, C and Snyder, S.B., "Basic Visual Concepts and Principles for Artists, Architects and Designers", McGraw Hill.
3. Laseau, P, "Graphic Thinking for Architects and Designers", John Wiley and Sons

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand human dimensions and their functions, space-activity by study of Anthropometrics.	PO1, PO2, PO3, PO7
CO2	Learning basic understanding of form and space in architecture	PO1, PO2, PSO3
CO3	Understand activities in different spaces and various elements of it	PO1, PO2, PO3, PO7, PO3, PO7
CO4	Learn by intense site analysis a better comprehension towards solution.	PO1, PO2, PO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											
CO2	**3**											
CO3			**2**									
CO4		**2**						**2**				
CO5			**3**									
CO6				**3**								
CO7		**3**						**3**				
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR120B	BUILDING CONSTRUCTION & MATERIALS-II	L	T	P	S	C
Version 2.0		**0**	**0**	**0**	**4**	**4**
Pre-requisites/Exposure	Detailing					
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.					

Course Objectives

1. To acquaint the students to building materials such as wood, stone & brick; and with construction techniques for the use of these materials in building works.

Course Outcomes

CO1. On successful completion of this course, the students have capability to
CO2. To acquaint the students to building materials
CO3. To understand building materials such as wood, stone & brick;
CO4. To understand construction techniques for the use of these materials in building works.
CO5. To understand joinery details
CO6. To be able to construct brick bonds, arches, masonry and do plastering practically in construction yard.
CO7. To be able to represent the detailing on drawings for communication of work at construction site.

Catalog Description

To acquaint the students to building materials such as wood, stone & brick; and with construction techniques for the use of these materials in building works. To be able to construct brick bonds and arches in construction yard.

Course Content

construction techniques for the use of these materials in building works.

UNIT I
MATERIALS:
BRICKS: Bricks for specific purposes like walls, flooring, cladding, tiling, etc. Their physical characteristics, specifications, manufacturing, testing, etc.

CONSTRUCTION:
Types of bricks, various brick bonds,
construction of arches

UNIT II
MATERIALS:
STONE: Stones for specific purposes like walls, flooring, cladding, tiling, etc. Their physical characteristics, types, specifications, uses etc.

CONSTRUCTION:
Various stone masonry, jointing and pointing, construction of arches

UNIT III
MATERIALS:
BINDING MATERIALS: Lime, Mud and Cement: availability, manufacturing, composition, physical and chemical properties, types, uses etc.
CONSTRUCTION:
Plastering, jointing and pointing

UNIT-IV
MATERIALS:
TIMBER: Structure, Classification, Characteristics, Seasoning, Storage, Defects, Preservation, Uses etc.
C O N S T R U C T I O N:
Details of Ledged & Braced batten doors and windows

Reference Books:

1. Farrelly, Lorraine, "Basic Architecture 02: Construction + Materiality", Ava Publishing
2. Agarwal, A., "Mud: The Potentials of Earth based Material for Third World Housing", IIED,
3. HUDCO, "All you wanted to know about Soil Stabilized Mud Blocks",
4. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill,
5. Rangwala, S. C., "Engineering Materials (Material Science)", Charotar Publishing House.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To acquaint the students to building materials	PO4,PO7
CO2	To understand building materials such as wood, stone & brick;	PO4,PO7

CO3	To understand construction techniques for the use of these materials in building works.	PO3
CO4	To understand joinery details	PO3
CO5	To be able to construct brick bonds, arches, masonry and do plastering practically in construction yard.	PO4
CO6	To be able to represent the detailing on drawings for communication of work at construction site.	PO2, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1	**3**			**3**			**3**					**3**
CO2		**2**	**2**	**3**	**2**		**3**			**2**		**3**
CO3			**3**			**2**						**3**
CO4		**2**	**3**					**2**			**3**	
CO5	**2**			**3**	**2**				**2**			
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR128A	THEORY OF DESIGN	**L**	**T**	**S**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Interest in Basic Design and keen Observation				
Co-requisites	Translation of Design Ideas				

Course Objectives

1. To understand 2D and 3D elements conceptually as well as their usage in Architectural Design.
2. To Understand of spaces, the connections in terms of circulation and order that governs the arrangement of spaces
3. To Understand the connections of spaces and their translation into drawing of plans and sections.

Course Outcomes

CO1. On successful completion of this course, the students have capability to:
CO2. Develop the ability to break spaces into elements and understand conceptually the spaces in simple forms.
CO3. Understand the breaking up of built form into functions and connections and the order that puts them together.
CO4. Understand the spaces and their communication through architectural drawings.

Catalog Description

Students understand the full range of design elements, principles, spaces, connections, and their interplay in human context. They explore these through a study of simple terms, their translation into form and space.
They then understand how architecture and other design integrate all these to make functional spaces and built form. This understanding can become the basis of all deign fields in being able to translate colours, textures, elements and ideas into workable design manifestations.

Course Content

The course begins with a simple understanding of 2D design elements like point, lines and planes. While all of us can easily visualize 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.

UNIT I: 8 lectures
The course begins with a simple understanding of 2D design elements like point, lines and planes. While all of us can easily visualize 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.
Definition of conservation and its socially accepted meanings, objectives.
Theories, Principles and concepts of conservation and its application.
Legislation in conservation.

UNIT II: 8 lectures
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).

UNIT III: 8 lectures
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 learn 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.

UNIT IV: 8 lectures
Elements of Biomimicry, parametricism, deconstructivism are studied to understand spaces as design beyond lines and planes. These concepts introduce students to fluid shapes and inspiration from nature.

Text book [TB]:

1. Francis D. K. Ching," Architecture, Form, Space and Order".

Reference book(s) [RB]:

1. Francis D. K. Ching, "Introduction to Architecture".
2. Francis D. K. Ching, "Design Drawing".

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Develop the ability to break spaces into elements and understand conceptually the spaces in simple forms.	PO3
CO2	Understand the breaking up of built form into functions and connections and the order that puts them together.	PO1, PSO3
CO3	Understand the spaces and their communication through architectural drawings.	PSO1, PO4

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO1								**2**				
CO2				**2**								
CO3		**2**										
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR124B	**ARCHITECTURAL DRAWING-II**	**L**	**T**	**P**	**S**	**C**
Version 2.0		**0**	**0**	**0**	**4**	**4**
Pre-requisites/Exposure	Visualization & coherent thinking					
Co-requisites	Drawing skills					

Course Objectives

1. To understand fundamental techniques of Visual representation.
2. To equip with the basic principles of 3-Dimensional space and building visualization.
3. To equip with the drawing of 3-Dimensional spaces and buildings
4. To understand complex 3D drawings with respect to buildings.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Draw free hand and also by using drawing instruments to produce: plans, sections, elevations to scale
CO2. Draw isometric and axonometric projections.
CO3. Draw one -point & two-point perspective.
CO4. Draw Sciography in plan, elevation and views.

Catalog Description

In the previous course, emphasis was given on understanding about one dimensional and two-dimensional visualization of an object. So, taking the course forward, now the emphasis given on understanding 3-dimensional visualization of a space and a building. This will be done with the help of various types of projections, perspectives and Sciography.

Course Content

1. Study of principles and techniques of axonometric, oblique and isometric views and construct three dimensional views of basic and complex geometrical shapes.
2. Basic terms, principles, types and techniques of geometrical perspective drawing.
3. Make perspective by measuring point method, Angular method and parallel perspective.
4. Make perspective of simple objects, inclined planes, cylindrical objects, arches and other circular forms etc. (one point or two point)
5. Prepare drawings on the presentation of interior and exterior views in one point perspective and section perspectives.
6. Sciography: Principles of shades and shadows
7. Drawing shades and shadows of lines, planes, solids and architectural features in plan, elevations and isometric view.

Text Books:

1. Engineering Drawing, N.D. Bhatt.
2. Engineering Drawing, R.K Dhawan

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	draw free hand and also by using drawing instruments to produce: plans, sections, elevations to scale	All except PSO4
CO2	Draw isometric and axonometric projections.	All except PO5, PSO4, PSO5

CO3	Draw one -point & two-point perspective.	All except PO5, PSO4, PSO5
CO4	Draw Sciography in plan, elevation and views.	All except PO5, PSO4,

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**3**						**1**				
CO2	**1**	**2**						**2**				
CO3	**1**	**3**						**3**				
CO4	**2**	**3**						**3**			**2**	
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR126A	**WORKSHOP**	**L**	**T**	**P**	**C**
Version 1.0		**0**	**0**	**4**	**2**
Pre-requisites/Exposure	Carpentry tools and joineries				
Co-requisites	Practical learning				

Course Objectives

1. To introduce the carpentry tools, processes and wood working machines and learn about carpentry joints and their uses.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. To get introduced to the carpentry tools and wood working machines along with welding part.
CO2. To understand processes involved in woodwork & welding.
CO3. Learning To learn about carpentry & welding joints.
CO4. Inculcate To learn about the uses of carpentry & welding joints.

Catalog Description

Understand the details of Carpentry and Welding tools & Techniques.

Course Content

UNIT I
To introduce carpentry tools, processes and wood working machines. To prepare three dimensional solids like cube, cuboids, pyramids, spheres, cone and cylinders and make a composition.

UNIT II
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
Fastenings, Carpentry tools and various connecting devices
To demonstrate the use of carpentry tools in making joints such as Dovetail Joint, Mortise and Tenon Joint, Lap joint, Butt Joint etc. to be used for making furniture.

UNIT III
To prepare joints (Lap and Butt) by metal arc welding

UNIT IV
To create complex three-dimensional forms for models using carpentry methods

Text Books:

1. Raghuwanshi, B.S., "A Course in Workshop Technology – 'Vol. I and II', Dhanpat Rai and Co.

Reference Books:

1. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons
2. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth.
3 McKay, W. B., Building Construction (Metric) (vol. 1 to 4).

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To get introduced to the carpentry tools and wood working machines along with welding joints. .	PO1
CO2	To understand processes involved in wood work & welding	PO2, PO3
CO3	To learn about carpentry & welding joints.	PO3, P07
CO4	To learn about the uses of carpentry & welding joints.	PO5, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO4**	**PSO5**
CO1				**1**								
CO2				**2**			**1**					
CO3				**3**					**2**			
CO4												
CO5												
CO6												
CO7												
1=lightly mapped				2= moderately mapped					3=strongly mapped			

APCE114A	STRUCTURAL DESIGN-II	**L**	**T**	**P/S**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Observation and Interest in the subject				
Co-requisites	Hands-on design experience and skills will be gained and learned through problem sets and a comprehensive design project				

Course Objectives

1. This course aims at providing students with a solid background on principles of structural engineering design.
2. Students will be exposed to the theories and concepts of concrete and analysis at the element and system levels.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. To understand the basic principles of structural mechanics that would be pertinent to simple design elements.
CO2. To understand concept of perfect frames in detail
CO3. To understand RCC construction in detail
CO4. To understand Design of Singly Reinforced Beams

Catalog Description

This course provides an ability to have a clear understanding of ethical issues pertaining to engineering and adopt industry standards of ethical behavior.
The course is designed to arouse an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use architectural judgment to draw conclusions and an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Content

UNIT I: 8 lectures

1. Analysis of perfect frames
2. Simple stresses in frames – Tensile & compressive

3. Analysis of a perfect truss by method of joints, method of sections, graphical method & Link polygon
4. Cantilever trusses
5. Simply supported trusses

UNIT II: 8 lectures

1. Overview of R.C.C. construction
2. Cement, coarse aggregate, Water and reinforcement materials.
3. Abram's water-cement ratio law
4. Stress-strain curves and characteristic strengths of structural steel.
5. Properties of Cement concrete & their impact on the structural strength,
6. Introduction to Nominal mix concrete and Design Mix Concrete.
7. Characteristic compressive strength of concrete and its determination,
8. Workability of concrete, Slump test, compacting factor test;
9. Compaction and Curing of concrete,
10. Durability of concrete, Gain of strength of concrete with time, Age factor

UNIT III: 8 lectures

1. Theory of R.C.C.
2. Advantages of RCC
3. Assumptions in the theory of RCC – Hooke's law
4. Distribution of stress in Steel & concrete – Modulus of Elasticity
5. Equivalent area of composite section
6. Theory of bending of RCC beams – Elastic theory & Ultimate load theory
7. Limit state method
8. Stress Strain diagram & Neutral axis & its position
9. Lever arm
10. Classification of RCC section
11. Balanced or economical
12. Over & under reinforced sections
13. Moment of resistance

UNIT IV: 8 lectures

1. Shear stresses in Beams
2. Design for shear
3. Bond stress & development length
4. Design of Singly Reinforced Beams

Text book [TB]:

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.
3. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
4. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.
5. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To understand the basic principles of structural mechanics that would be pertinent to simple design elements.	PO1, PSO2
CO2	To understand concept of perfect frames in detail	PO1, PO3
CO3	To understand RCC construction in detail	PO5, PO4
CO4	To understand Design of Singly Reinforced Beams	PO1 ,PO4

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO5**
CO1	**1**								**1**		**1**	
CO2			**1**						**2**			
CO3			**2**						**3**			
CO4			**3**						**3**			**1**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR130B	**EARLY EUROPEAN ARCHITECTURE**	L	T	P	C
Version 2.0		2	0	0	2
Pre-requisites/Exposure	Historical Study				
Co-requisites	Logical Thinking				

Course Objectives

1. To generate an understanding about the development of civilizations and its impact on contemporary architecture.
2. Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.
3. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand architecture of the period as a solution to the need or demands of the society.

CO1. Understanding the development of civilizations and its impact on contemporary architecture.

CO2. Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.

Catalog Description

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.

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.

The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students are introduced to a chronological study of world architecture starting with development of civilizations to contemporary times. 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).

Course Content

Unit I: 8 lectures

Continuing with detailed study of Greek and Roman Architecture, the students study history of Architecture in the world with details of the classical orders & advancements in construction techniques of the Romans (vaults, domes, aqueducts and stucco).

Unit II: 8 lectures

Emphasis on Byzantine and Romanesque 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).

Unit III: 8 lectures

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.

Unit IV: 8 lectures

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.

Text Books

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press
2. Hiraskar, G.K., "The Great Ages of World Architecture (with Introduction to Landscape Architecture)", Dhanpat Rai Publications (P) Ltd.

Reference Books/Materials

1. Francis D K Ching, mark jarzombek, Vikramaditya Prakash.: A Global History of Architecture,
2. Online References: - https://www.pdfdrive.com/a-global-history-of-architecture-e184758967.html

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand architecture of the period as a solution to the need or demands of the society.	PO1, PO3
CO2	Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.	PO3
CO3	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.	PO4, PO7

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO5**
CO1	**1**		**2**									
CO2			**2**									
CO3			**3**									**1**
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR132B	ARTS AND GRAPHICS-I	L	T	S	C
Version 2.0		0	0	3	3
Pre-requisites/Exposure	Basic sketching				
Co-requisites	Drawing skills				

Course Objectives

1. This subject is a blend of the technique of art and architecture drawing that it teaches logics of rendering on conventional drawing format.
2. 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.
3. It makes able students to observe nature and architecture forms through a graphic perspective.
4. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. To understand the techniques of sketching in different mediums.
CO2. To understand the techniques of rendering in different mediums.
CO3. To be able to sketch still life sketches, to be able to represent scaled graphics of foliage
CO4. To be able to draw shades and shadows, to understand color theory

Catalog Description

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 learn how to render architecture forms as well as the nature around the proposed project with various drawing and painting mediums. It makes students 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.
Students must practice sketching with 5-6 sketches per week.

Course Content

UNIT I:
Indoor sketching, to practice still life sketching of objects and figures with shades and shadows using pencil etc. (black and white) Outdoor sketching, practice still life sketching of objects & figures with shades &shadow using pencil etc. To understand principals of drawing shades &shadows with source of light being sun

UNIT -II

Color theory- color mixtures, colour systems, colour organization, application of colour schemes, national and international standards on colour.

Use of colors and coloring techniques. Brush control exercises in water, oil, poster, crayon and mixed media.

UNIT- III

– Representation of scaled graphics of foliage-trees, plants & shrubs, human figures & furniture etc.

Architectural Presentation & Rendering of Landscape Elements:

– To practice presentation and rendering of Trees, herbs, shrubs, ground covers, contours & water bodies as a single entity, and in clusters / groups in association with built forms, both in plans & elevations, in Black & White and in color.

UNIT- IV

Architectural presentation & rendering of inanimate objects in manmade environment:

– To practice presentation and rendering of both plans & elevations of cars, furniture, buildings, accessories such as telephone, desktops, etc., in Black & White and in Colour.

Architectural presentation & rendering of human figures:

– To practice presentation and rendering of both plans & elevations, in Black & White and in Colour.

Text Books

1. Malik, Shankar, "Perspective and Sciography", Allied Publishers,

Reference Books/Materials

1. Robert W. Gill , "Rendering with pen and ink"
2. Leslie, Martin C., "Architectural Graphics", Macmillan Pub Co

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To understand the techniques of sketching in different mediums.	PO1
CO2	To understand the techniques of rendering in different mediums.	PO2
CO3	To be able to sketch still life sketches, To be able to represent scaled graphics of foliage	PO4
CO4	To be able to draw shades and shadows, To understand color theory	PO5, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO5**
CO1	**1**	**2**										
CO2	**1**	**2**										
CO3	**2**	**3**										
CO4	**1**	**3**										
CO5												
CO6												
CO7												
1=lightly mapped				2= moderately mapped					3=strongly mapped			

APAR471A	**PROFESSIONAL COMMUNICATION**	**L**	**T**	**P**	**S**	**C**
Version 1.0		**2**	**1**	**0**	**0**	**3**
Pre-requisites/Exposure	Basic Professional communication skills					
Co-requisites	Professional ethics					

Course Objective:

1. Understand the basics of Grammar to improve written and oral communication skills.
2. Understand the correct form of English with proficiency
3. Improve student's personality and enhance their self-confidence.
4. Improve professional communication.
5. Enhance academic writing skills.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand the basics of Grammar to improve written and oral communication skills
CO2. Understand the correct form of English with proficiency
CO3. Improve student's personality and enhance their self-confidence
CO4. Improve professional communication
CO5. Enhance academic writing skills

Catalogue Description

This learning program with its practice-based learning tasks will facilitate the learners to enhance their communication skills in a modern and globalized context, enhance their linguistic and communicative competence and hone their interpersonal skills.

Course Content

U NIT I : 16 lectures
Introduction to Communication: Importance of Communication Skills, Meaning, Forms & Types of Communication; Process of Communication; Principles of Effective

Communication/7Cs, Barriers in Communication (Interpersonal, Intrapersonal and Organizational).

UNIT II: 16 lectures
Academic Writing: Précis (Summary – Abstract – Synopsis – Paraphrase – Précis: Methods), Letter & Résumé (Letter Structure & Elements – Types of letter: Application & Cover - Acknowledgement – Recommendation – Appreciation – Acceptance – Apology – Complaint –Inquiry).Writing a proposal and synopsis. Structure of a research paper. Citations and plagiarism.

UNIT III: 16 lectures
Technology-Enabled Communication: Using technology in communication tasks, E-mails, tools for constructing messages, Computer tools for gathering and collecting information; Different virtual medium of communication.
UNIT IV: 16 lectures
Building Vocabulary: Word Formation (by adding suffixes and prefixes); Common Errors; Words Often Confused; One word substitution, Homonyms and Homophones; Antonyms &Synonyms, Phrasal Verbs, Idioms & Proverbs (25 each); Commonly used foreign words(15 in number);

UNIT V : 16 lectures
Personality Development: Etiquettes& Manners; Attitude, Self-esteem & Self-reliance; Public Speaking; Work habits (punctuality, prioritizing work, bringing solution to problems), Body Language: Posture, Gesture, Eye Contact, Facial Expressions; Presentation Skills/ Techniques.

Text book [TB]:

1. Kumar, Sanjay and Pushplata.*Communication Skills*.Oxford University Press, 2015.

Reference Books/Materials

1. Mitra, Barun K. *Personality Development and Soft Skills*. Oxford University Press, 2012.
2. Tickoo, M.L., A. E.Subramanian and P.R.Subramaniam.*Intermediate Grammar, Usage and Composition.* Orient Blackswan, 1976.
3. Bhaskar, W.W.S., AND Prabhu, NS., " English Through Reading", Publisher: MacMillan,1978
4. Business Correspondence and Report Writing" -Sharma, R.C. and Mohan K. Publisher: Tata McGraw Hill1994
5. Communications in Tourism & Hospitality- Lynn Van Der Wagen, Publisher: HospitalityPress
6. Business Communication-K.K.Sinha
7. Essentials of Business Communication By Marey Ellen Guffey, Publisher: ThompsonPress
8. How to win Friends and Influence People By Dale Carnegie, Publisher: Pocket Books
9. Basic Business Communication By Lesikar&Flatley, Publisher Tata McGraw Hills
10. Body Language By Allan Pease, Publisher SheldonPress

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination, Examination Scheme:

Components	Quiz I	Quiz II	Mid Term Exam	Presentation/ Assignment/ etc.	End Term Exam
Weightage (%)	10	10	20	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand the basics of Grammar to improve written and oral communication skills	PO1, PSO1
CO2	Understand the correct form of English with proficiency	PO9,PSO1
CO3	Improve student's personality and enhance their self-confidence	PO9
CO4	Improve professional communication.	PO9
CO5	Enhance academic writing skills	PO3,PSO1

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1						**1**						**1**
CO2						**2**						**2**
CO3						**3**						**2**
CO4						**3**						**2**
CO5						**3**						**2**
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

SEMESTER III

APAR217A	ARCHITECTURAL DESIGN-II	L	T	P	S	C
Version 1.0		0	0	0	10	10
Pre-requisites/Exposure	Basic Designing					
Co-requisites	Creativity					

Course Objectives

1. Understanding of the design complexities and contradictions to resolve architectural design problems for Housing of different typologies and public buildings.
2. How to design the built environment of Housing/ other public building in urban context/areas.
3. Characteristics of a public building.
4. Understanding the significance of building design in line with local building regulations.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand basic structure and forms in relation to space and materials & application of structural forms in design.

CO2. Inculcate appreciation of the design process in resolving design of an institutional nature.

CO3. Learning on various developmental complexities and contradictions involved in an urban structure and pattern.

CO4. Inculcate the theoretical basis for design decisions in the guidelines provided for the same.

Catalog Description

Understand the details of drawings especially of construction system and materials, services etc. Able to incorporate basic solutions to achieve design goals for other projects such schools, art galleries etc.

Course Content

The projects would address the study of built form and its relationship to the site, surrounding s and climatic setting.
The study would induce students to experiment with built and open space.

Vernacular 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.

REFERENCE BOOKS:

1. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill
2. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande
3. The Discovery of Architecture: a contemporary treaties on ancient values and indigenous reality, M.N. Ashish ganju and Narendra Dengle
4. Agarwal, A., "Mud: The Potentials of Earth based Material for Third World Housing", IIED
5. Christopher Benninger , "Letters to a Young Architect"
6. Time-Saver Standards for Building Types
7. Architectural Standard Ernst Peter Neufert Architects Data
8. Time-Saver Standards for Architectural Design Data

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand basic structure and forms in relation to space and materials & application of structural forms in design.	PO1
CO2	Inculcate appreciation of the design process in resolving design of an institutional nature.	PO2, PO3
CO3	Learning on various developmental complexities and contradictions involved in an urban structure and pattern.	PO4
CO4	Inculcate the theoretical basis for design decisions in the guidelines provided for the same.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											
CO2	**2**						**3**					
CO3				**3**								
CO4									**3**			
CO5		**3**						**3**				
CO6							**3**					**3**
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR219A	BUILDING CONSTRUCTION & MATERIALS-III	L	T	P	S	C
Version 2.0		0	0	0	5	5
Pre-requisites/Exposure	Detailing					
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.					

Course Objectives

1. To acquaint the students to usage of building materials such as Cement, Glass, Ceramics, Surface (Wall) Finishing, Painting &Polishing and Roof Coverings (Conventional)
2. To familiarize the students with construction techniques for use of the above materials in building works.
3. To introduce construction details of various elements of single storied building of load-bearing masonry and foundations
4. To familiarize the student with the basic building construction practices on site/yard

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Focus on various building materials and construction techniques based on the performing standards and codes
CO2. Understand latest trends in practice and usage of new technology/ materials
CO3. Learn from procuring materials to the manufacturing of products in different industries CO4. Understand the constituents, defects, classifications, treatments, preservations and uses of traditional building materials
CO4. Understand the use of building materials in joinery details and complex constructions with higher load capacities

Catalog Description

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 also focus on latest trends in practice and usage of new technology/materials.

Course Content

UNIT I
FOUNDATION: SHALLOW AND DEEP FOUNDATION
Foundations: isolated, combined, eccentric footing and raft foundation. Pile foundations – details of pile, varieties of piles, pile caps.
CONSTRUCTION: Construction details of shallow and deep foundations

UNIT II
FLOORING

Mud, Brick & terracotta tiles flooring, Cement concrete, Stone slabs, Terrazzo, Ceramic & Vitrified tiles, Wooden flooring, PVC, etc.

ADHESIVES:
Introduction
Natural Adhesives – Animal, Casein, Bituminous.
Thermoplastic Adhesives – Polyvinyl Acetate.
Thermosetting Adhesives & Plastics - Urea Formaldehyde, Phenol Formaldehyde, Melamine Formaldehyde, Resorcinol Formaldehyde,
Epoxide Resins, Rubber Adhesive.

CONSTRUCTION: Construction detail for laying the above floors on Ground and RCC slab.

UNIT III
MATERIALS:
ROOFING & ROOF COVERINGS: Clay Tiles (Country, Allahabad, Mangalore tiles etc.), Concrete Tiles, Asbestos Cement sheets (Plain & Corrugated), Aluminium Sheets (Plain & Corrugated), Galvanised Iron Sheets (Plain & Corrugated), Stone Slating, Shingles, Thatch.

CONSTRUCTION:

ROOFS AND TRUSSES: Timber roofs for small spans. Large timber trusses (12 meter span) . Simple flat, jack arch, Construction details of king-post trusses.
UNIT IV
TIMBER PRODUCTS:
BOARDS: Decorative & Commercial Plywood and Boards – types and qualities, Ply board, block board, Particle board, Wood cement board, Fiber board, Compressed straw board, Cement fiber board etc.
VENEERS & LAMINATES
C O N S T R U C T I O N:
WOODEN DOORS: Details of Flush, Panelled & Glazed doors, their fastenings, fittings & fixtures.
WOODEN WINDOWS: Details of panelled and glazed windows, their fastenings, fittings & fixtures.

Note:
Assignments could be in the form of market surveys for building materials and study of latest building materials in the building construction industry.
Students are also required to do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

TEXT BOOK:

1. Rangwala, S. C., “Engineering Materials (Material Science)”, Charotar Publishing House.

REFERENCE BOOKS:

1. Farrelly, Lorraine, “Basic Architecture 02: Construction + Materiality”, Ava Publishing,
2. Watson, Donald, “Time-saver Standards for Building Materials and Systems”, Tata McGraw Hill

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Focus on various building materials and construction techniques based on the performing standards and codes.	PO2, PSO1, PSO2, PS03
CO2	Understand latest trends in practice and usage of new technology/ materials	PO2, PO3, PSO5
CO3	Learn from procuring materials to the manufacturing of products in different industries	PO2, PO1, PO6
CO4	Understand the constituents, defects, classifications, treatments, preservations and uses of traditional building materials	PO2, PO7
CO5	Understand the use of building materials in joinery details and complex constructions with higher load capacities	PO2, PSO1, PSO2, PS03

Programme and Course Mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											**3**
CO2	**3**											
CO3			**3**									**3**
CO4										**3**		
CO5			**3**									**3**
CO6												
CO7												

1=lightly mapped 2= moderately mapped 3=strongly mapped

APAR241B	**INDIAN ARCHITECTURAL HISTORY**	L	T	P	C
Version 2.0		2	0	0	2
Pre-requisites/Exposure	Knowledge of basic history.				
Co-requisites	Logical Thinking				

Course Objectives:

1. To generate an understanding about the development of civilizations and its impact on contemporary architecture.
2. Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.
3. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand architecture of the period as a solution to the need or demands of the society.

CO2. Understanding the development of civilizations and its impact on contemporary architecture.

CO3. Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.

Catalog Description

History of Indian Architecture intends to form a connection between past and present. 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.

The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students are introduced to a chronological study of Indian architecture starting with development of civilizations to contemporary times. 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).

Course Content

Unit I : 8 lectures

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.

Unit II: 8 lectures

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.

Unit III: 8 lectures

Hindu Architecture continues with details of Temle Architecture: Nagara Style, Dravidian Style, Vesara Style of temples and Forts, Palaces, stepwells, gates and baradaris etc. across the country with special emphasis on the famous temples of North and South India.

Unit IV: 8 lectures

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).

Text Books

1. Grover, S. K., "Buddhist and Hindu Architecture in India", CBS.
2. Grover, S. K., "Islamic Architecture in India", CBS

Reference Books/Materials

1. Brown, Percy, "Indian Architecture – Vol I and II", Apt Books.
2. Maheshwari and Garg, "Ancient Indian Architecture", CBS. .
3. Thapar, B., "Introduction to Indian Architecture", Periplus Editions.
4. Surendra S., "Indian Architecture: Hindu, Buddhist and Jain", Ajanta Offset and Packaging Ltd.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand architecture of the period as a solution to the need or demands of the society.	PO1, PO3
CO2	Understand the development of civilizations and its impact on contemporary architecture.	PO3
CO3	Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.	PO4, PO7

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO5**
CO1		**2**			**3**			**2**				**3**
CO2			**3**							**3**		
CO3		**2**		**1**		**2**	**3**		**1**	**2**	**2**	**3**
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR239A	ENVIRONMENT & CLIMATE	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Understanding basics of environment and climate				
Co-requisites	Implementation in design				

Course Objectives

1. To familiarize the students with the Environment & climatological aspects associated with the Architectural Design Develop creative conceptual visualization and the process of design
2. To acquire knowledge of solar geometry.
3. To acquire knowledge of Air temperature Understand creation of spaces with making a social contribution such as resource centers, libraries etc.
4. To acquire knowledge of relationship of wind with topography Explore the knowledge of audio visual communication, sound control system etc.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. To familiarize the students with the Environment & climatological aspects associated with the Architectural Design Develop creative conceptual visualization and the process of design

CO2. To acquire knowledge of solar geometry.

CO3. To acquire knowledge of Air temperature Understand creation of spaces with making a social contribution such as resource centres, libraries etc.

CO4. To acquire knowledge of relationship of wind with topography Explore the knowledge of audio visual communication, sound control system etc.

Catalog Description

This course imparts the basic concepts of environment and climate. It enables them to design and enhance a site according to the location, climate and needs of the client. The course introduces the basic concepts about human comfort, ways of achieving it, solar geometry- its implementation in designing buildings as per orientation, shading devices-designing, wind movement patterns around buildings, etc.

Course Content

UNIT I: 8 lectures

Introduction to Environment & Climate:

- Basic understanding about Environment & Climate
- Factors affecting Environment –effects on Land, Forest, Water & Energy
- Factors affecting climate,

Elements of climate – Solar radiation, Temperature, Wind, Humidity & Precipitation, Sky condition, Night Radiation and their measurement.

- Classification of Climatic zones & their characteristics
- Characteristics of tropical climate,

- Macroclimate and Microclimate.
- Green House Effect, Global warming & its effects.
- Human Thermal Comfort:

Concept of heat physics : Study of body's heat production and heat loss – heat balance (heat temperature, Thermal mass& capacity, Latent heat ,Conduction Convection, Radiation & Evaporation)

- Comfort zone, thermal comfort, heat stress, individual variation
- Bioclimatic chart and effective temperature

UNIT II: 8 lectures

Solar Geometry: Relationship of Earth & Sun

- Direct and indirect insulation,
- Types of waves - infrared, visible light, ultraviolet, reflectivity and emissivity.
- Methods of recording sun's position in relation to earth, Solar Chart
- Radiation gains on various walls and roofs in various seasons.

Day light: Natural lighting, Glare, day light factor and day lighting in tropics.

- Colour, amount of light, sky as a source of light,
- Effect of size and shape of opening in different planes with & without obstructions,
- Intensity of light spread, penetration,
- Design and setting of buildings for day light.

Shading Devices:

- Shadow angle protractor and its application in designing of shading devices.
- Application of solar change in the design of sun control device.
- Sun machine and their uses.

UNIT III: 8 lectures

Air temperatures:

- Factors that influence temperatures - sun latitude, season, land, water, wind, altitude, atmospheric impurities, green open areas, trees and urban areas.
- Inversion of temperature. Insulation, resistance insulation , capacity Insulation thermal diffusivity, thermal conductivity,
- Heat transmission through building components, time lag, i.e. value AIR heat transmittance co-efficient, scale, and temperature.

UNIT IV: 8 lectures

Wind:

- Study of diurnal and seasonal variations,
- Heating and cooling effect,
- Effect of topography,
- Effect of wind on location of industrial areas, airport & other land uses and road patterns.

Ventilation, Air-movement and Air change:

- Air patterns around buildings, & within buildings.
- Wind eddies, size and position of openings with & without overlays & other architectural elements.

Orientation:

- Orientation of buildings in relation to sun and wind.

Text Books

Manual of Tropical Housing and Building: Climatic design, by Otto H. Koenigsberger, Longman, – Architecture

Reference Books/Materials

1. Krishnan, A. (ed.), Baker, N., Yannas, S., Szokolay, S., Climate Responsive Architecture – A
2. Givoni, B., Man, Climate and Architecture, Elsevier Publishing Company Limited.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/ Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To familiarize the students with the Environment & climatological aspects associated with the Architectural Design	PO1, PO4
CO2	To acquire knowledge of solar geometry	PO3, PO4
CO3	To acquire knowledge of Air temperature	PO3, PO4
CO4	To acquire knowledge of relationship of wind with topography	PO3, PO4, PO7

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1												
CO2												
CO3												
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR225B	ARTS & GRAPHICS-II	L	T	S	C
Version 1.0		0	0	3	3
Pre-requisites/Exposure	Basics of Art				
Co-requisites	Integration of techniques and medium of art in design.				

Course Objectives

1. To understand the different mediums in expressing design and application of colors & sculpting mediums.
2. To improve Aesthetical & Design sense of students.
3. To develop the observation capacity, the need to interact with nature and document by sketching and painting.

Course Outcomes

CO1. On successful completion of this course, the students have capability to:

CO2. Graphically represent the architectural design better by developing their artistic skill rather than simply arranging the space

CO3. Understand the full range of art techniques and mediums and use them creatively in expressing design.

CO4. Extract the inherent logic onstruction, structural stability as well as aesthetics through observation and expressing through graphics.

Catalog Description

This subject is a blend of the technique of art and architecture drawing and helps students develop their rendering on conventional drawing format. The students of architecture learn how to render architecture forms as well as the nature around the proposed project with various drawing and painting mediums.

Students 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 and express 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 .

Course Content

To understand the application of colors and art techniques useful in architectural design representation:

Unit I

- Exploring with pen of varying thicknesses.
- Doodling and form rendering
- Creating building perspective Drawings with pen

Unit II

- Exploring nature with pen of varying thicknesses
- Doodling and form rendering of landscape elements
- Understanding of human figures and scale of buildings
- Combining building design with nature around it.

Unit III

- Exploring Sections through use of pens of different thicknesses

- Understanding Depth and perspective in sections with the use of ink and rendering
- Combining all elements done in UNIT I , II and III

Unit IV

- Introduction of colours with printed or ink rendered drawings
- Combining all mediums done till this stage to enhance architectural drawings.
- Rendering of all plans, site plan, sections and elevations using all tools and techniques learnt so far.

Reference book(s) [RB]:

1. Gill, Robert W.; Rendering with Pen and Ink (April1984); Thames & Hudson.
2. Ching, D.K Francis: Form, Space and Order (2015); John Wiley & Sons, New Jersey.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Graphically represent the architectural design better by developing their artistic skill rather than simply arranging the space	PO2, PO4
CO2	Understand the full range of art techniques and mediums and use them creatively in expressing design.	PO1, PSO1
CO3	Extract the inherent logic of construction, structural stability as well as aesthetics through observation and expressing through graphics.	PO2, PO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**2**				**1**				
CO2	**3**			**2**				**2**				
CO3	**2**			**2**				**3**				
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR227B	COMPUTER APPLICATIONS IN ARCHITECTURE-I	L	T	P	C
Version 2.0		0	0	4	2
Pre-requisites/Exposure	Basic knowledge of computers				
Co-requisites	Drawing skills				

Course Objectives

1. To familiarize with software associated with making drawing, formatting, and presentation
2. Development of effective presentation techniques

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Learn drafting software AutoCAD

CO2. Integrate software learning tool with the design studio project like Adobe package and MS office package

CO3. Able to create good quality interior drawings in 3D Software's

Catalog Description

Empowering students to use computers as 2D drafting and 3D modelling tool and to familiarize realistic rendering and presentation techniques using computers

Course Content

Unit-I. Word processing

- Introduction to Applications of MS Office in presentation: Microsoft Word, Microsoft Power Point and Microsoft Excel.

Unit-II. Introduction to AutoCAD as 2D drafting tool

- Digital drawings tools, drawing lines and shapes, modifying lines and shapes, drawing with accuracy and speed. Organizing plans, sections and elevations, drawing and printing to scale, text styles and sizes, hatches and dashed lines. Stencils and blocks, advanced editing tools, and dimensioning drawings.

Unit-III. Introduction to 3D Modelling and Rendering

- Modelling and basic rendering techniques, using Google Sketchup or equivalent

Reference Books/Materials

1. Gindis, E. (2014). Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling. Oxford : Elsevier.
2. Seidler, D. R. (2007). Digital Drawing for Designers: A Visual Guide to AutoCAD 2012. London Fairchild Publications.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Mid-term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand Computer applications and its relevance in Architecture.	PO1
CO2	Students will develop a clear understanding of the softwares.	PO2
CO3	The students understand and relate to the concept of making interiors and 3ds.	PO4
CO4	Understanding and developing AutoCAD commands and making plans, sections, and detailed drawings on the software.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**2**				**1**				
CO2	**3**			**2**				**2**				
CO3	**2**			**2**				**3**				
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APCE237A	STRUCTURAL DESIGN-III	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Observation and Interest in the subject				
Co-requisites	Analyzing, designing, simulating, visualizing, optimizing, monitoring and assessing the behavior and environmental interactions of structures and structural materials from a holistic perspective.				

Course Objectives

1. Design of concrete structures addresses the process on both at conceptual and at mathematical level.
2. 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.
3. The students will learn the analysis and design of beam, slab, columns, foundation and designing methods.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Students will have a clear understanding of Design of Lintels with sunshade and Slabs spanning in one direction.
CO2. To acquire knowledge of Elementary treatment of concrete technology
CO3. Understanding of Difference between Working Stress Method and Limit State Method
CO4. Better understanding of detailing of reinforcement and serviceability of limit state.

Catalog Description

This course provides an ability to have a clear understanding of ethical issues pertaining to engineering and adopt industry standards of ethical behavior.
The course is designed to arouse an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use architectural judgment to draw conclusions and an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Content

UNIT I: 8 lectures
- 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

UNIT II: 8 lectures
- 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

UNIT III: 8 lectures
- Analysis & Design of Reinforcement for a section subjected to torsion also
- Shear & Torsion
- Longitudinal reinforcement
- Transverse reinforcement
- Side face reinforcement

UNIT IV: 8 lectures
- Design of two way slabs with
- Grashoff Rankine's theory
- IS Code 456-1978 method
- Simply supported
- Edges fixed & continuous & uniform loading
- Torsional reinforcement

Text book [TB]:

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.
3. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
4. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.
5. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Students will have a clear understanding of Design of Lintels with sunshade and Slabs spanning in one direction.	PO1, PSO2
CO2	To acquire knowledge of Elementary treatment of concrete technology.	PO1, PO4
CO3	Understanding of Difference between Working Stress Method and Limit State Method	PO3, PO4
CO4	Better understanding of detailing of reinforcement and serviceability of limit state.	PO1 ,PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**								**1**		**1**	
CO2			**1**						**2**			
CO3			**2**						**3**			
CO4			**3**						**3**			**1**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APCE233A	SURVEYING & LEVELLING	L	T	S	C
Version 1.0		1	0	0	1
Pre-requisites/Exposure	Basics of math, mapping, graphing and plotting				
Co-requisites	Understanding of different maps, scales and surveying instruments				

Course Objectives

1. To understand the importance of surveying in the field of civil engineering.
2. To study the basics of linear/angular measurement methods like chain surveying, compass surveying.
3. To study the significance of plane table surveying in plan making.
4. To know the basics of levelling and theodolite survey in elevation and angular measurements.
5. To understand tachometric surveying in distance and height measurements.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Understand the fundamentals and principles of surveying and measurement of distance.

CO2. Understand the angular measurement by traversing and level of ground points from reference datum.

CO3. Better understand the horizontal and vertical angle measurement and field area calculations.

CO4. Better understand the finding the location of inaccessible stations on sites and aerial survey

Catalog Description

This course will introduced the fundamentals of surveying measurements to provide a broad overview of the surveying instrumentation (Total Station, Compass, Auto Level, Theodolite, Plane Table, Chains and Tapes), procedures, measurement corrections and reductions, survey datum, and computations that are required to produce a topographical map or a site plan for engineering and design projects.

Course Content

UNIT I: 4 lectures

- Introduction to surveying,
- Understanding land topography and its relevance in Architecture.

UNIT II: 4 lectures

- Types of surveys in practice
- Introduction to survey equipments.
- Principles of survey, equipment require

UNIT III: 4 lectures

- Types of compasses.
- The prismatic compass, its construction and uses,
- Different types of levels, their temporary and permanent adjustment, leveling staff

UNIT IV: 4 lectures

- Characteristics of contour lines,
- Direct and indirect methods of contouring and interpolation of contours.
- Marking foundations, measuring buildings under construction.
- Tacheometric Surveying:
- General instruments,
- Different systems of tacheometric measurements -Stadia method &Subtense method.
- Photogrammatery:
- Definition, principles and application of photography in Surveying.

Reference book [RB]:

1. Rangwala, Surveying &Levelling, Charotar Publishing House.
2. R.Subramanian, Surveying&Levelling, Oxford Higher Education.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand the fundamentals and principles of surveying and measurement of distance.	PSO3
CO2	Understand the angular measurement by traversing and level of ground points from reference datum.	PSO1, PO2
CO3	Better understand the horizontal and vertical angle measurement and field area calculations.	PO1
CO4	Better understand the finding the location of inaccessible stations on sites and aerial survey	PO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**1**					**1**			
CO2	**1**			**2**								
CO3	**1**			**2**								
CO4	**2**			**3**								
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APCE235A	SURVEYING & LEVELLING LAB	L	T	P	C
Version 1.0		0	0	2	1
Pre-requisites/Exposure	Basics of math, mapping, graphing and plotting				
Co-requisites	Understanding of different maps, scales and surveying instruments				

Course Objectives

1. To determine the relative position of any objects or points of the earth.
2. To determine the distance and angle between different objects.
3. To prepare a map or plan to represent an area on a horizontal plan.
4. To develop methods through the knowledge of modern science and the technology and use them in the field.
5. To solve measurement problems in an optimal way.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Understand working of different type of surveying equipment.
CO2. Use surveying equipment s in field for measurement of distance, direction and elevation.
CO3. Adjust the traverse and calculation of coordinates i.e., latitude and departures.
CO4. Use surveying data for preparation of maps.

Catalog Description

Surveying is the art of determining the relative positions of different objects on the surface of the earth by measuring the horizontal distances between them and vertical angle either in elevation or depression. From the observations obtained is corrected and plotted on paper to prepare the map in the suitable scale. Thus, in discipline, the measurements are taken in the horizontal plane as well as vertical plane.

Course Content

UNIT I

- Chain Surveying:
- Selection of station, methods of taking offsets, Booking the field notes,
- Obstacles in chaining, errors in chaining,
- Chaining on sloping ground & reciprocal ranging.
- Leveling:
- Book of the readings and reduction of levels.
- Errors in leveling.
- Curvature and refraction reciprocal leveling profile, leveling cross sections.

UNIT II

- Compass Surveying:
- Reduced & whole circle bearing, magnetic declamation, effects of local attraction.
- Compass traverse and balancing the closing error.

UNIT III

- Plane Tabling:
- Equipment and methods.
- Two points and three points problems.
- Contouring:
- Interpretation and preparation of contour maps.
- Site modeling with total station.
- Exercises in setting out of building works.

UNIT IV

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

Reference book [RB]:

1. Rangwala, Surveying &Levelling, Charotar Publishing House.
2. R.Subramanian, Surveying&Levelling, Oxford Higher Education.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Mid-term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand working of different type of surveying equipment.	PO3, PO4
CO2	Use surveying equipments in field for measurement of distance, direction and elevation.	PO5
CO3	Adjust the traverse and calculation of coordinates i.e., latitude and departures.	PO1
CO4.	Surveying data for preparation of maps	PO2, PSO1

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**1**					**1**			
CO2	**1**			**2**								
CO3	**1**			**2**								
CO4	**2**			**3**								
CO5												
CO6												
CO7												
1=lightly mapped				2= moderately mapped					3=strongly mapped			

APAR245A	ARCHITECTURAL PHOTOGRAPHY	L	T	P	C
Version 1.0		**1**	**1**	**0**	**2**
Pre-requisites/Exposure	Photography skills				
Co-requisites	Learning techniques				

Course Objectives

1. Students will have a clear understanding of Architectural photography and where it came from.
2. Understand relevance of different kinds of photography.
3. The student starts to understand the evolution of forms, colours, shades, textures etc.
4. The students will also learn how to use a camera and the different functions which cameras can do.

Course Outcomes

On completion of this course, the students will be able to

CO1. The course is designed to arouse in the student a sense of perspective and photography.

CO2. The students will generate an understanding about the development, evolution and benefits of photography in architecture.

CO3. The students are introduced to a chronological study of world architecture and also the different kinds of photographs taken of them so that they can explore the kind of angels which can be made.

CO4. The students understand the various factors by which focusing on an object depends. They will also explore options which give a photograph maximum impact.

Catalog Description

Students will be able understand the purpose of the photography in architecture. The students will learn about scale, colors etc. which make a photograph better. Students need to provide their own photographic equipment, but they are free in their choice of technology and format: pinhole/digital/manual, large/medium/small. The use of a digital camera is by no means required, but recommended, as everyone will be expected to present a body of work during each session. Using a tripod is highly encouraged.

Course Content

Unit I : 10 lectures

Photographic Communication Introduction to photography, types of Cameras, equipment-cameras & lenses, Principles of photo composition. Exposure, Aperture, Speed, colour, black & white, Film processing, printing & developing.

Unit II: 11 lectures

Architectural Photography and Photo Journalism Architectural Photography, Exterior and Interior photography. Photo journalism, Practical exercises to understand composition.

Unit III: 11 lectures

Photographic Documentation, Photo documentation of buildings highlighting quality of architectural spaces.

Reference Books/Materials

1. Harris, M. (2001). Professional Architectural Photography. Focal Press.
2. Harris, M. (2002). Professional Interior Photography. Focal Press.
3. Heinrich, M. (2008). Basics Architectural photography. Bikhauser Verlag AG.
4. Sounders, D. (1988). Professional Advertising Photography. London : Merchurst.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Test 1	Test 1	Quizzes/Tutorials/ Assignment 1	Quizzes/Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	The course is designed to arouse in the student a sense of perspective and photography.	PO1
CO2	The students will generate an understanding about the development, evolution and benefits of photography in architecture.	PO2
CO3	The students are introduced to a chronological study of world architecture and also the different kinds of photographs taken of them so that they can explore the kind of angels which can be made.	PO4
CO4	The students understand the various factors by which focusing on an object depends. They will also explore options which give a photograph maximum impact.	PO5, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**							**1**		**1**		
CO2				**1**								
CO3				**1**								
CO4				**2**								
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

SEMESTER IV

APAR218A	ARCHITECTURAL DESIGN–III		L	T	P	S	C
Version 1.0			0	0	0	10	10
Pre-requisites/Exposure		Basic Designing					
Co-requisites		Creativity					

Course Objectives

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

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Able to experiment with built and open spaces.

CO2. Understand relationship of spaces to the site, surroundings and climatic setting.

CO3. Understand architectural design as a process of anthropometrics and module development as a unit that can be arranged in multiple ways to build a relationship between inside and outside

CO4. Develop the language of architecture on micro and macro scale by developing the detailed module and its arrangement in a larger context.

CO5. Develop locally applicable techniques and materials in developing the architectural spaces.

CO6. To integrate all subjects and topics covered in previous semesters into the design including building services.

Catalog Description

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.

Course Content

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.

Reference Books/Materials

1. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill
2. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande
3. The Discovery of Architecture: a contemporary treaties on ancient values and indigenous reality, M.N. Ashish ganju and Narendra Dengle
4. Agarwal, A., "Mud: The Potentials of Earth based Material for Third World Housing", IIED
5. Christopher Benninger , "Letters to a Young Architect"

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Able to experiment with built and open spaces.	PO1,PO4
CO2	Understand relationship of spaces to the site, surroundings and climatic setting.	PO1, PO3
CO3	Understand architectural design as a process of anthropometrics and module development as a unit that	PO1, PO7

	can be arranged in multiple ways to build a relationship between inside and outside	
CO4	Develop the language of architecture on micro and macro scale by developing the detailed module and its arrangement in a larger context.	PO1, PO2
CO5	Develop locally applicable techniques and materials in developing the architectural spaces.	PO3, PO4
CO6	To integrate all subjects and topics covered in previous semesters into the design including building services.	PO1, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**							**3**				
CO2			**2**					**3**				
CO3			**3**			**2**		**3**				
CO4		**3**					**2**					
CO5	**3**								**2**	**3**		
CO6	**2**								**3**			
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR220A	**BUILDING CONSTRUCTION & MATERIALS-IV**	**L**	**T**	**P**	**S**	**C**
Version 2.0		**0**	**0**	**0**	**5**	**5**
Pre-requisites/Exposure	Learn Detailing					
Co-requisites	Drawing skills					

Course Objectives

1. To familiarize the students with the various aspects of building construction

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand ferrous materials in detail.
CO2. Able to make detailed architectural construction drawing of steel staircase.
CO3. Understand non-ferrous materials in detail.
CO4. Able to make detailed architectural construction drawing of Aluminium door, window and partitions.
CO5. Understand glass and plastic materials in detail.
CO6. Able to make detailed architectural construction drawing of Curtain wall, Structure Glazing, UPVC windows and doors.

Catalog Description

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.

Course Content

UNIT I
MATERIALS:
METALS: Ferrous – Iron (Pig, Cast & Wrought).

CONSTRUCTION:
Steel staircase, Metal stairs - types and construction details of steel stairs.
Grillage Footing.

UNIT II
MATERIALS:
METALS: Nonferrous – Aluminum, zinc, Copper, and Alloys

CONSTRUCTION:
Doors, Windows & Partitions: Aluminum sections

UNIT III
MATERIALS: Glass and Plastic

CONSTRUCTION:
Curtain wall, Structure Glazing, UPVC windows, doors etc.

UNIT IV
MATERIALS: Gypsum, Paints and Varnishes
Introduction - Gypsum Board, Ceiling Board & Tiles, Gypsum Plaster, Components and Accessories. Jointing and finishing
Varnishes: Natural and synthetic clear varnishes, French polish.

CONSTRUCTION: False Ceiling and Partitions

Note: Assignments could be in the form of market surveys for building materials and study of latest building materials in the building construction industry. Students are also required to do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

REFERENCE BOOKS:
1. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
2. BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.
3. Foster, Stroud (1963) Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.

4. McKay, W. B. (1972) Building Construction (Metric), Longman, London, vol. 1 to 5.
5. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
6. Punmia, B. C. (2005) Building Construction, Firewell Media, Delhi.
7. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi.
8. Rangwala, S. C., "Engineering Materials (Material Science)", Charotar Publishing House.

WEB REFERENCES:

1. http://en.wikipedia.org/wiki/Building_material
2. www.bmtpc.org/pubs/book12.pdf
3. http://www.habitattechnologygroup.org/

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand ferrous materials in detail.	PO3,PO7
CO2	Able to make detailed architectural construction drawing of steel staircase.	PO2,PO6
CO3	Understand non-ferrous materials in detail.	PO3, PO5, PO7
CO4	Able to make detailed architectural construction drawing of Aluminium door, window and partitions.	PO1, PO2, PO4, PO6
CO5	Understand glass and plastic materials in detail.	PO3, PO5, PO7
CO6	Able to make detailed architectural construction drawing of Curtain wall, Structure Glazing, UPVC windows and doors.	PO1, PO2, PO6, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											**3**
CO2			**2**									**3**
CO3						**2**						**3**
CO4											**3**	
CO5	**3**											**3**
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR232B	RENAISSANCE TO INDUSTRIAL REVOLUTION	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Knowledge of European and Indian history.				
Co-requisites	Historical study				

Course Objectives

1. To generate an understanding about the development of civilizations and its impact on contemporary architecture.
2. Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.
3. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand architecture of the period as a solution to the need or demands of the society.

CO2. Understanding the development of civilizations and its impact on contemporary architecture.

CO3. Generate an understanding about the development and evolution of architecture as a culmination of various factors like location, climate, socio-cultural, historical, economic and political influences.

Catalog Description

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.

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.

The course shall include sketching and understanding of historical buildings, historical analysis, and visit to places of historical importance. The students are introduced to a chronological study of world architecture starting with development of civilizations to contemporary times. 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).

Course Content

Unit I: 8 lectures

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.

Unit II: 8 lectures
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.

Unit III: 8 lectures
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.

Unit IV: 8 lectures
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.

Text Books

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press
2. Hiraskar, G.K., "The Great Ages of World Architecture (with Introduction to Landscape Architecture)", Dhanpat Rai Publications (P) Ltd.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand architecture of the period as a solution to the need or demands of the society.	PO1, PO3
CO2	Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.	PO3

CO3	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.	PO4, PO7

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**2**	**1**	**2**	**1**	**2**
CO2	**2**	**3**	**2**	**2**	**1**	**3**	**2**	**3**	**2**	**3**	**2**	**3**
CO3	**2**	**1**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**3**
CO4	**2**	**2**	**2**	**3**	**2**	**3**	**2**	**1**	**2**	**2**	**3**	**2**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR222B	**ARTS AND GRAPHICS-III**	L	T	S	C
Version 1.0		0	0	3	3
Pre-requisites/Exposure	Advance sketching, rendering				
Co-requisites	Drawing skills				

Course Objectives

1. This subject is a blend of the technique of art and architecture drawing that it teaches logics of rendering on conventional drawing format.
2. 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.
3. It makes able students to observe nature and architecture forms through a graphic perspective.
4. 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.

Course Outcomes

On completion of this course, the students will be able to

CO1. 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

CO2. It emphasizes Importance of manual rendering in architecture drawing and how does it enhance students' creativity and precision of defining objects in drawing.

CO3. 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.

CO4. 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.

Catalog Description

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. 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.

Course Content

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.
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.

Text Books

1. Malik, Shankar, "Perspective and Sciography", Allied Publishers,

Reference Books/Materials

1. Robert W. Gill , "Rendering with pen and ink"
2. Leslie, Martin C., "Architectural Graphics", Macmillan Pub Co

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	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	PO1
CO2	It emphasizes Importance of manual rendering in architecture drawing and how does it enhance students' creativity and precision of defining objects in drawing.	PO2
CO3	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.	PO4
CO4	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.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**2**				**1**				
CO2	**3**			**2**				**2**				
CO3	**2**			**2**				**3**				
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR224B	COMPUTER APPLICATIONS IN ARCHITECTURE II	L	T	P	C
Version 2.0		0	0	4	2
Pre-requisites/Exposure	Advance knowledge of computers				
Co-requisites	Drawing skills				

Course Objectives

1. To familiarize with software associated with making drawing, formatting, and presentation
2. Development of effective presentation techniques

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Learn drafting software AutoCAD
CO2. Able to create good quality drawings in 3D Software's
CO3. Understand use and application software's for making presentation drawings

Catalog Description

Empowering students to use computers as 3D modelling tool and to familiarize realistic rendering and presentation techniques using computers

Course Content

Unit-I. Introduction to AutoCAD as 3D drafting tool
Need of 3d dimension, the convention of AutoCAD, plan view in AutoCAD, co-ordinate system in 3d, plan view in AutoCAD, using object snap in 3d, construction of wire frame model, solid modeling using primitives, solid modeling from 2d geometry, union, subtract, region, 3d orbit, 3d array, 3d mirror, rotate, align, slice, fillet, using lights in rendering, point light, spot light, sun properties, material.

Unit-II. Presentations
Introduction of various software available for presentation such as Adobe package- Photoshop, InDesign & Illustrator or equivalent

Unit-III. Advanced 3D Modelling
Advanced modelling, V-Ray rendering engine, or equivalent.

Reference Books/Materials

1. Bark, S. (2012). An Introduction to Adobe Photoshop. Ventus Publishing ApS, Sheffield.
2. Gindis, E. (2014). Up and Running with AutoCAD 2015: 2D & 3D Drawing and Modelling. Oxford : Elsevier.
3. Seidler, D. R. (2007). Digital Drawing for Designers: A Visual Guide to AutoCAD 2012. London Fairchild Publications.
4. Bark, S. (2012). An Introduction to Adobe Photoshop. Sheffield : Ventus Publishing ApS.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Learn drafting software AutoCAD	PO1
CO2	Able to create good quality interior drawings in 3D Software's	PO3,PO6
CO3	Understand use and application software's for making presentation drawings	PO7,PSO1, PSO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**2**				**1**				
CO2	**3**			**2**				**2**				
CO3	**2**			**2**				**3**				
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APCE228A	**STRUCTURAL DESIGN-IV**	**L**	**T**	**S**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Basics of Structural Analysis and Mechanics				
Co-requisites	Understanding of different structures and their behavior under loading conditions				

Course Objectives

1. To introduce the students to the fundamentals of reinforced concrete design with emphasis on the design of flat slabs, short and slender columns, footings and foundations. In addition, student will learn how to analyse, and design reinforced concrete structural members under bending, shear, and/or axial loads according to the IS building code requirements.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Acquire knowledge of design of flat slab.
CO2. Understanding the terminology related to columns and its design concepts.
CO3. Better understanding of design and detailing of columns subjected to direct and bending stresses.

CO4. Better understanding of design of foundations.
CO5. Understand design of combined footing.

Catalog Description
This course will cover flexural analysis and design of reinforced concrete structures including, shear and diagonal tension, serviceability, bond, anchorage and development length of flat slab short and slender columns and footings in reference to architecture requirements.

Course Content
UNIT I: 8 lectures
- Design of flat slabs
- Continuous frame method
- Empirical design method of flat slabs

UNIT II: 8 lectures
- Design of axially loaded RCC columns
- Long & short columns
- Lateral reinforcement for columns
- Permissible stresses in RCC columns
- Effective length
- Slenderness ratio
- Eccentricity
- Longitudinal & Transverse reinforcement
- Pitch & dia of ties
- Helical reinforcement
- Cover to reinforcement
- Permissible loads for compression member
- Composite columns, RCC walls

UNIT III: 8 lectures
- Direct & Bending stresses
- Columns subjected to tensile & compressive load & bending
- Design of columns subjected to combined bending & direct stresses
- ISI note on design of columns subjected to combined bending & direct stresses

UNIT IV: 8 lectures
- Isolated column footing & continuous footing for walls
- Square, rectangular, trapezoidal & circular footings
- Inclusive of one way and two shears
- Flexure & checks
- IS code for design of footing
- Design of continuous wall footing
- Design of isolated column footing
- Design of combined footing
- Shapes of combined slab footing
- Design steps slab footing
- Design steps slab footing with centre beam
- Strap footing
- Mat or Raft foundation

Reference book [RB]:

1. IS: 883–1984 (reaffirmed 2005), Code of Practice for Design of Structural Timber in Buildings.
2. IS: 1905–1987 (reaffirmed 2002), Code of Practice for Structural Use of Un-reinforced Masonry.
3. Design of Masonry and Timber Structures by Singh H. Abhishek Publications, Chandigarh.
4. Design and Construction of Wood Framed Buildings by Morton Newman, McGraw Hill Inc., New York.
5. Design of Steel Structures by Dr. S.M.A. Kazimi, R.S. Jindal, Prentice Hall of India Private Ltd., New Delhi.
6. Comprehensive Design of Steel Structures by Dr. B.C. Punmia , Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publications (P) Ltd., New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Acquire knowledge of design of flat slab	PSO2
CO2	Understanding the terminology related to columns and its design concepts.	PSO2, PO1
CO3	Better understanding of design and detailing of columns subjected to direct and bending stresses.	PSO2, PO3
CO4	Better understanding of design of foundations	PSO2, PO4
CO5	Understand design of combined footing.	PSO2, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**								**1**		**1**	
CO2			**1**						**2**			
CO3			**2**						**3**			
CO4			**3**						**3**			**1**
CO5	**1**		**2**						**3**			
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR230A	BUILDING SERVICES-I (WATER SUPPLY & SANITATION)	L	S	T	P	C
Version 1.0		2	0	0	0	2
Pre-requisites/Exposure	Basics of services					
Co-requisites	Implementation in design					

Course Objectives

1. To understand the basic fundamentals of water supply and sanitation
2. To make them enable to draw the piping system (pipe above ground and underground) for different types of buildings
3. To integrate the knowledge of water supply and sanitation in Architectural design.
4. To enable students to understand water supply, drainage, sewage and storm water management at residence level.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Acquire knowledge of services in buildings
CO2. Draft layout of simple drainage systems for small buildings. Like residence
CO3. Familiarize with water supply systems from source (municipality level) to building level.
CO4. Water supply system design for domestic & multi-storied buildings

Catalog Description

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.

Course Content

Unit-I. Water Supply: 8 lectures

- 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

Unit-II. Water Supply: 8 lectures

- Water supply design of a residence: Connection with water mains, design of Underground & Overhead water tanks
- Water pump capacity
- calculations for diameter of pipe
- Introduction to water supply in a multistoried building.

Unit-III. Sanitation: 8 lectures

- Definition of Refuse, garbage, rubbish, sullage, sub soil water, storm water, night soil, sewage sanitary, domestic & industrial, sewer, sewerage & waste water
- Various drainage & sanitary fixtures & fittings, traps - role of water seal, sizes, materials and their space requirements, Water efficient and waterless fixtures
- Types of pipes and drains in different materials and their usage, diameter of pipes, slope standards • Inspection and Intercepting chambers, manholes etc.
- Sewage and Effluent treatment- Innovative and cost-effective sanitation concepts e.g., Eco SAN

Unit-IV. Sanitation: 8 lectures

- 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 rain
- Water Harvesting & Groundwater Recharge
- Zero discharge concepts

Note:

Exercise: Design a layout for a residence for water supply, drainage, sewage and storm water

Reference Books/Materials

1. Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons.
2. & National Building Code of India. (2005)
3. Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi : Laxmi Publications
4. Punmia, B. C., Jain, A. K. and Jain, A.K. (1998). Waste Water Engineering. New Delhi : Laxmi Publications
5. Rangwala, S. C. (2005). Water Supply and Sanitary Engineering. Charoter Publishing

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc.	Attendance	End term exams
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Acquire knowledge of services in buildings	PO7
CO2	Draft layout of simple drainage systems for small buildings. Like residence	PSO1, PSO2, PSO3
CO3	Familiarize with water supply systems from source (municipality level) to building level.	PO3, PO6, PSO5
CO4	Water supply system design for domestic & multi-storied buildings	PO1, PO2

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**1**	**-**	**-**	**-**
CO2	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**1**	**-**
CO3	**3**	**2**	**2**	**2**	**3**	**-**	**3**	**-**	**1**	**2**	**1**	**-**
CO4	**3**	**2**	**3**	**3**	**3**	**-**	**3**	**3**	**1**	**2**	**1**	**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR244A	ART & ARCHITECTURE APPRECIATION	L	T	S	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Historical Context and significance of Art, Architecture				
Co-requisites	Integration of History, Aesthetics, Appreciation				

Course Objectives

1. To bring in an awareness of the process of evolution of different contemporary styles in Art and Architecture in India.
2. To learn about the hidden meaning and value of design in 2D and 3D forms like paintings, sculpture, architecture and the relationship among them.
3. To understand the context, meaning and appreciate pieces of Art and Architecture.
4. To explore visual art forms and their cultural connections by learning about the history of art and its principles. Includes in-depth studies of the elements, media, and methods used in creative thought and the creative process.

Course Outcomes

CO1. The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation.

CO2. The students will generate an understanding about the arts and architecture of India and detailed look at a work of art that combines physical attributes with subjective statements based on the viewer's reaction to the work.

CO3. The students are introduced to Historical, religious, or environmental information that surrounds a particular work of art that helps to understand the work's meaning

CO4. The students will be able to give a critical point of view about a work of art or architecture concerning its aesthetic or cultural value

Catalog Description

This course will guide the student in appreciating art pieces, sculptures and buildings. The students will understand the different aspects of understanding these in terms of their social, historical context and appreciating the arrangement of colours, spaces, features as well as physical forms.

After completing this course, students will be able to interpret works of art and architecture explaining the processes involved in artistic production; identify the political, social, cultural, and aesthetic issues that artists examine in their work; and explain the role and effect of the visual arts and architecture in contemporary terms.

Course Content

UNIT I: 8 lectures

- Defining Art and Architecture. The process and training of interpreting them.Study of the following Architects and Artists: Achyut Knvinde, Brinda Somaya, B.V. Doshi, Charles Correa, M.F. Hussain, Krishen Khanna, Anjolie Ela Menon, Arpana Caur.

UNIT II: 8 lectures

- Understanding art and their artists. Finding the hidden meaning.– The Elements and Principles of Visual Language.
- Study of the following Architects and Artists: Hafeez Contractor, Rahul Mehrotra, Laurie Baker, Nari Gnadhi, Raj Rewal, Sheila Sri Prakhash, Sheela Gowda, Anita Dube, Subodh Gupta.

UNIT III: 8 lectures

- Learning about Artistic Media and Architecture. Learning about how the world functions based on Nature, Body, Identity, Sexuality, Politics and powers and how to reflect them in art and how it was reflected by various artists.
- Study of the following Architects and Artists: Anant Raje, Bimal Patel, Joseph Allen Stein, Sonali Bhagwati, Sunita Kohli, S.H. Raza, Francis Newton Souza, Alicia Souza.

UNIT IV: 8 lectures

- Learning about the other world- Myths, Dreams, Spirituality and interpretation. Learning about how art is at different places at different times (the western world).
- Comparison and Analysis between different Architects and artists according to their works.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation.	PO3, PO1
CO2	The students will generate an understanding about the arts and architecture of India and detailed look at a work of art that combines physical attributes with subjective statements based on the viewer's reaction to the work.	PO4,
CO3	The students are introduced to Historical, religious, or environmental information that surrounds a particular work of art that helps to understand the work's meaning	PO7, PO4
CO3	The students will be able to give a critical point of view about a work of art or architecture concerning its aesthetic or cultural value	PO3,PSO5

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1			**2**									
CO2			**2**									
CO3			**2**									
CO4			**3**				**2**					
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

SEMESTER V

APAR325A	ARCHITECTURAL DESIGN–IV	L	T	P	S	C
Version 1.0		0	0	0	10	10
Pre-requisites/Exposure	Basic Designing					
Co-requisites	Creativity					

Course Objectives

1. To understand basic structure and forms in relation to space and materials & application of structural forms in design.
2. 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.
3. The continuation of this leads to understanding of architecture as an outcome of 'space and structure'.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand basic structure and forms in relation to space and materials & application of structural forms in design.

CO2. Inculcate appreciation of the design process in resolving design of an institutional nature.

CO3. Learning on various developmental complexities and contradictions involved in an urban structure and pattern

CO4. Learn about user behaviour and design guidelines pertaining to physically handicapped in structure

CO5. Inculcate the theoretical basis for design decisions in the guidelines provided for the same

CO6. Grow the knowledge of building infrastructure and services from an abstract idea to detail

Catalog Description

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.

Students to put emphasis on structure of large span structures and prepare structural models.

Course Content

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
- All portfolio two drawings construction system and materials, services.

Reference Books/Materials

1. Watson, Donald, "Time-saver Standards for Building Materials and Systems", Tata McGraw Hill
2. Design Dialog: Dialectics of Design in Architecture, Prof. Shireesh A. Deshpande
3. The Discovery of Architecture: a contemporary treaties on ancient values and indigenous reality, M.N. Ashish ganju and Narendra Dengle
4. Agarwal, A., "Mud: The Potentials of Earth based Material for Third World Housing", IIED
5. Christopher Benninger , "Letters to a Young Architect"

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand basic structure and forms in relation to space and materials & application of structural forms in design.	PO4,PSO1
CO2	Inculcate appreciation of the design process in resolving design of an institutional nature	PO1, PO3
CO3	Learning on various developmental complexities and contradictions involved in an urban structure and pattern	PO4
CO4	Learn about user behaviour and design guidelines pertaining to physically handicapped in structure	PO5, PO7
CO5	Inculcate the theoretical basis for design decisions in the guidelines provided for the same	PO1,
CO6	Grow the knowledge of building infrastructure and services from an abstract idea to detail	PO3, PO4

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**1**							**2**			
CO2		**2**	**3**									
CO3							**2**					
CO4			**1**				**2**					
CO5				**2**								
CO6			**2**						**3**			
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR331A	**BUILDING CONSTRUCTION AND MATERIALS -V**	**L**	**T**	**P**	**S**	**C**
Version 1.0		**0**	**0**	**0**	**5**	**5**
Pre-requisites/Exposure	Detailing					
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.					

Course Objectives

1. To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction.
2. To understand the use of the above said building materials in simple building works.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Make a decision which type of construction detailing will be required for a given Industrial application/ Building types for roof and Bridges for long and short span truss system and make drawings for the same.

CO2. Understand design and execute R.C.C with different materials.

CO3. Understanding different types of slab/Beams in R.C.C and prepare detail drawings.

Catalog Description

To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction.

Course Content

UNIT I

M A T E R I A L S:

METALS: Ferrous –Steel

Introduction to structural steel, types of steel used in buildings, joining details of various steel members

Market survey of available steel sections

C O N S T R U C T I O N:

Steel beam and Column connections

Steel trusses- Lattice Girder and North-light truss, Tubular truss, Portal Frames, etc.
UNIT II
M A T E R I A L S: Timber and Steel
C O N S T R U C T I O N:
Scaffolding and Shuttering
UNIT III
M A T E R I A L S: Reinforced cement Concrete
C O N S T R U C T I O N: Various R.C.C. Columns and Beam details, Plinth Beam, One-way slab, Two-way Slab, Cantilever slab etc.
Note: Assignments could be in the form of market surveys for building materials and study of latest building materials in the building construction industry. Students are also required to do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

Reference Books:
1. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
2. BIS (2013) National Building Code, SP 7, Bureau of Indian Standards.
3. Foster, Stroud (1963) Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
4. McKay, W. B. (1972) Building Construction (Metric), Longman, London, vol. 1 to 5.
5. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
6. Punmia, B. C. (2005) Building Construction, Firewell Media, Delhi.
7. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi.
8. Relevant IS codes

Web References:
1. www.bmtpc.org/pubs/book12.pdf
2. http://www.habitattechnologygroup.org/

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Make a decision which type of construction detailing will be required for a given Industrial application/ Building types for roof and Bridges for long and short span truss system and make drawings for the same.	PO1,PO2
CO2	Understand design and execute R.C.C with different materials.	PO2, PO3
CO3	Understanding different types of slab/Beams in R.C.C and prepare detail drawings.	PO2,P06

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**		**2**	**3**		**3**	**3**		**3**	**2**		
CO2	**3**	**3**		**2**						**3**	**2**	
CO3			**3**		**2**		**3**		**3**			
CO4	**3**		**3**									**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR333B	**MODERN WORLD ARCHITECTURE**	**L**	**T**	**P**	**C**
Version 2.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Knowledge of European and Indian Architectural history.				
Co-requisites	Logical thinking				

Course Objectives

1. To understand the growth and development of architecture and appreciation of the role of the intangibles that brought this growth & development from the 18th to 21st century to the advent of European, Indian and global development.
2. Understand relevance of different kinds of architectures.
3. 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.
4. The architectural study is to be linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.

Course Outcomes

On completion of this course, the students will be able to

CO1. The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation. To generate an understanding about the development of civilizations and its impact on modern architecture.

CO2. To understand the chronological study of the world architecture starting with development of civilizations in context of location, climate, socio-cultural, historical, economic and political influences.

CO3. Understanding the modern world buildings and surroundings in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.

CO4. Understanding architecture of the period as a solution to the need or demands of the society.

Catalog Description

Modern World 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 modern context. The architectural study is to be

linked with the social developments of civilizations, geographical and geological factors, materials and structures etc.
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 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). 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.

Course Content

UNIT I: 8 lectures
- Colonial Architecture in India – (late 18th to early 20th century):
- Colonial culture reflecting in the architecture of India, Emphasis on the buildings of Kolkata, Goa, Delhi & Mumbai.
- Portuguese-Goa, Dutch-Coromandel, Malabar, French-Pondicherry
- Birth of Indo Sarcenic Architecture- Lutyen's Delhi

UNIT II: 8 lectures
- Modern architecture: 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 van deRohe) /Artist and their works such as (Basically to learn the difference of Architecture style between all)
- 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

UNIT III : 8 lectures
- (Postmodern Architecture)
- (Architecture of early 19th and late 20th century): Architects Philosophies & their works
- American architecture
- Birth of American Skyscrapers
- Introduction to Chinese Architecture style.

UNIT IV: 8 lectures
- (Brief Introduction to various styles)
- Constructivism DE –Constructivism (Examples of various Architects works)
- Biomimetic-Gherkin Building, London
- Parametricism

Text Books

1. Cruickshank, D., Fletcher, B., Saint A., "Banister Fletcher's - A History of Architecture", Architectural Press.

Reference Books/Materials

1. Snyder, J and Catanese, A, "Introduction to Architecture", McGraw-Hill,
2. Farrelly, Lorraine, "The Fundamentals of Architecture", Ava Publishing
3. Voordt and Wegen, "Architecture in Use", Architectural Press,
4. Smithies, K.W., "Principles of Design in Architecture", Van Nostrand Reinhold Co,
5. Roger H. Clark and Michael Pause, "Precedents in Architecture",Van Nostrand Reinhold Co.
6. Parmar, V. S., "Design Fundamentals in Architecture", Somaiya Publications Pvt. Ltd.

Web References:

1. http://en.wikipedia.org/wiki/Architectural_theory
2. http://www.britannica.com/EBchecked/topic/32876/architecture/31858/Theory-of-architecture
3. http://www.greatbuildings.com

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc	Attendance	End term examinations
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	The course is designed to arouse in the student a sense of curiosity and to sharpen his powers of observation.	PO1, PO7
CO2	To understand the chronological study of the world architecture starting with development of civilizations in context of location, climate, socio-cultural, historical, economic and political influences.	PO2,PO4
CO3	Understanding of the periods in terms of their context of location, climate as well as the geographical, cultural, historical, economic and political influences of the time.	PO3, PO4
CO4	Understanding architecture of the period as a solution to the need or demands of the society.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			2				2					
CO2			3				2					
CO3			3				2					
CO4			3				2					
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR329A	**HOUSING**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding basics of housing				
Co-requisites	Application of Housing Policies and programmes.				

Course Objectives

1. To understand the housing fundamentals, policies programmes, housing process & design.
2. To study & design of housing schemes with defined parameters.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Acquire knowledge of concept of housing.
CO2. Acquire knowledge of housing policies and programmes
CO3. Acquire knowledge of housing standards for design.
CO4. Acquire knowledge housing finance.

Catalog Description

This course imparts the basic concepts of housing fundamentals, policies programmes, housing process & design.

Course Content

UNIT I: Introduction to housing: 8 lectures

- 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
- Formal and informal housing
- Housing characteristics and situation

UNIT II: Policies & Programmes : 8 lectures

- Housing in 5 year plans
- National Housing policies
- National housing schemes and programmes
- Elements of housing policy
- Housing surveys

- Housing agencies

UNIT III: Housing standards and design: 8 lectures
- Housing typology
- Residential gross and net density
- Understanding of FAR, FSI, Ground coverage and other development controls
- Housing standards, and basic principles of formulating standards
- Desirable and minimum design standards
- Form and structure of housing as shaped by socio-economic & physical parameters: location, topography, development controls, climate etc.
- Community and neighbourhood factors
- Latest trends of Market

UNIT IV: Housing Finance: 8 lectures
- Finance agencies
- Obstacles in financing
- Banking and non-banking institutions for financing

Text Books

1. Rangwala, Town Planning, Charotar publishing House, Anand.

Reference Books/Materials

1. Chiara Joseph De et al (1995). Time saver standards for housing and residential development. McGraw Hill, New York
2. Correa, C. (1999) Housing and urbanization, Urban Design Research Institute, Mumbai.
3. Mehta, M. and Mehta, D. (1989) Metropolitan housing market. Sage Publications, New Delhi
4. 4. Housing, Compilation of housing Related Topics for AITP examination, Instt of Town Planners.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term examinations
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Acquire knowledge of concept of housing.	PO1, PO4,PO7
CO2	Acquire knowledge of housing policies and programmes	PO4, PO7

CO3	Acquire knowledge of housing standards for design.	PO1,PO3, PO4
CO4	Acquire knowledge housing finance.	PO3, PO4, PO7

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			**2**							**2**		
CO2			**3**				**3**			**3**		
CO3			**3**				**3**			**3**		
CO4			**3**				**3**			**3**		
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR323B	**COMPUTER APPLICATION IN ARCHITECTURE-III**	**L**	**T**	**P**	**S**	**C**
Version 2.0		**0**	**0**	**4**	**0**	**2**
Pre-requisites/Exposure	Learning softwares					
Co-requisites	Drawing skills					

Course Objectives

1. To develop or upgrade an understanding about Autodesk Revit Architecture, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Learn drafting software Revit
CO2. Able to create good quality drawings in 3D Software's
CO3. Understand use and application software's for making presentation drawings

Catalog Description

Empowering students to use computers as 3D modelling tool and to familiarize realistic rendering and presentation techniques using computers

Course Content

Unit I. Getting Started Revit Architecture
Introduction, Modifying the view, Common tasks, System options, File locations, Spelling options, Settings, Keyboard shortcuts, Levels and grids, Zooming, Steering wheels.

Unit II. Building the Model and Modify

Walls, Doors, Windows, Components, Architectural columns, Roofs, Ceilings, Floors, Openings, Model text, Model lines, Compound structure, Sloped surfaces, Stairs, Ramps, Railings, Adding and modify curtain wall. Attaching wall to roof, Modifying the entry deck, Modifying the roofs.

Unit III. Presentation
Dimensions, Keynotes, Tags, Symbols, Adding legend views, Creating a detail callout, Adding filled and masking regions, Using detail components, Creating sheet, Sheet properties

Reference Books/Materials

1. Autodesk Revit Architecture 2012: No Experience required – Eric WinG
2. Mastering Autodesk Revit Architecture 2012 – James Vandezande, Phil Read, Edd

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Learn drafting software Revit	PO1
CO2	Able to create good quality drawings in 3D Software's	PO3, PO6
CO3	Understand use and application software's for making presentation drawings	PO7,PSO1, PSO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**			**2**				**1**				
CO2	**3**			**2**				**2**				
CO3	**2**			**2**				**3**				
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APCE315A	STRUCTURAL DESIGN-V	L	T	S	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Observation and Interest in the subject				
Co-requisites	Starting with putting limits in the allowable (working) stresses in various materials to achieve indirect safety factors, the design process slowly evolved within last few decades to more explicit consideration of different load and capacity factors				

Course Objectives

1. The basic objective is to produce a structure capable of resisting all applied loads without failure and excessive deformations during its anticipated life.
2. The course curriculum deals with the study of various design aspects of pre-stressed concrete and design of stair case.
3. The students will learn the analysis and design of singly and doubly reinforced beam by limit state method and working stress method.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Understand design philosophies, basic elements of structures.
CO2. Understand reinforcing details and concreting.
CO3. Understand Basic principles of working stress and limit state methods.
CO4. Understand Design of domes, shells and folded plates.

Catalog Description

Students will evaluate the effect of the environment on service life performance, properties and failure modes of concrete structure. Designing of different structural components with their practical application.

Course Content

UNIT I: 8 lectures

- Limit state method
- Concept of Limit state design
- characteristics strength of steel & concrete
- Design values,
- Loads & loading conditions
- Limit state of collapse & serviceability
- Limit state method vs working stress method, Building code.
- Theory & design by Limit state method, of
- singly reinforced,
- Doubly-reinforced
- L & T beams

UNIT II: 8 lectures

- Pre stressed concrete
- Elements, Principles and systems,

- loss of pre stress,
- analysis of pre stresses and
- design of beam, circular tanks & pipes

UNIT III: 8 lectures
- Design & detailing of Stairs
- With stair slab spanning horizontally
- With stair slab spanning vertically
- Distribution of loading on staircase
- Design of doglegged stairs
- Design of stairs with quarter space landing

UNIT IV: 8 lectures
- Domes, shells & folded plates
- Theory & design
- Stresses in spherical domes
- Stresses in domes due to Universally distributed load
- Stresses in domes due to concentrated load at crown, combined UDL & concentrated loads and wind loads

Text book [TB]:

1. BIS (2000) Indian Standard Code of Practice for Plain and Reinforced Concrete I.S: 456, Bureau of Indian Standards.
2. Punmia, B. C., Jain, A. K., and Jain, A. K. (1992) Reinforced concrete structures, Vol. I, Firewall Media, New Delhi.
3. Singh, H. (2008) Design of Reinforced concrete structures for Architects, Abhishek Publications, Chandigarh.
4. Mallick, S. K. and Gupta, A. P. (1980) Reinforced Concrete, Oxford & IBH publishing company Pvt. Ltd. New Delhi.
5. Shetty, M. S. (2008) Concrete Technology, S. Chand Limited.
6. Neville A. M. (2012) Properties of Concrete, Prentice Hall
7. Mehta, P. K. and Moterio, P. J. M. (2005) Concrete: Microstructure and properties, McGraw-Hill Professional
8. Dayaratnam P. (1983) Reinforced Concrete Design, M. Primlani.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand design philosophies, basic elements of structures.	PO1, PSO2

CO2	Understand reinforcing details and concreting.	PO1, PO3
CO3	Understand Basic principles of working stress and limit state methods.	PO3, PO4
CO4	Understand Design of domes, shells and folded plates.	PO1 ,PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**								**1**		**1**	
CO2			**1**						**2**			
CO3			**2**						**3**			
CO4			**3**						**3**			**1**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APCE317A	**ESTIMATING, COSTING & SPECIFICATIONS**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Implementation in practise				

Course Objectives

1. To initiate the students into theory and practice of estimation and quantity surveying.
2. To develop the understanding of specification writing.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understanding of storing & handling of different types of materials

CO2. Knowledge about Estimate of building components, interior, plumbing & electrification installation

CO3. Acquire Knowledge about detailed estimates & schedule of rates

CO4. Analyze different types of contracts, tender document for building

CO5. Acquiring information on the process of tendering, price rise mechanism and award of tenders

Catalog Description

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.

Course Content

Unit I. Specifications (Materials) : 8 lectures

Introduction, importance and scope. Types of specifications, Correct form and sequence of clauses for writing specifications. Study and uses of standard specifications viz; drafted by C.P.W.D. Writing detailed specifications for various building materials e.g. Bricks, Aggregates (fine & coarse), Cement, Reinforcement, Timber, Glass and Paints.

Unit II. Specification (Items of works) : 8 lectures
Writing detailed specifications for various items of work e.g. Earthwork in foundation, Cement concrete, Reinforcement cement concrete work, Brick work in cement mortar, Damp proof course, Wood works (door & windows), Glazing, Plastering (cement & sand), Flooring (cement concrete & tiles), Distempering (dry & oil bound), Painting on wood & iron work, Water proof cement painting, Brick bat coba terracing.

Unit III. Estimation : 8 lectures
Introduction, Importance & scope. Types of Estimates – Preliminary, Plinth area, Cubical content, Approximate quantity, Detailed / Item rate method estimates. Method of Estimation – Separate / individual wall, Centre line methods of estimation.

Unit IV. Estimation (Exercises) : 8 lectures
Exercises in estimation using different methods, for small or medium size buildings.

Unit V. Rate Analysis
Labour out turns and norms of consumption of basic materials. Principles of analysis of rates, Market / DSR rates of labour and materials. Exercises in rate analysis of various items of work mentioned in Module – 2.

Unit VI. Accounting Procedures
Introduction to P.W.D accounts procedure, measurement book, daily labour, muster roll, stores, stock, and issue of material from stock, indent form, impress account, cash book, and mode of payment.

Reference Books/Materials

1. Dutta, B. N. (2003) Estimating and Costing, UBS Publishers
2. Birdie, G. S. Estimating and Costing
3. Chakraborthi, M. Estimation, Costing and Specifications, Laxmi Publications
4. Kohli, D.D and Kohli, R.C. (2004) A Text Book of Estimating and Costing, S.Chand & Company Ltd.
5. Brook, Martin. (2004) Estimating and Tendering for Construction Work, 3rd edition, Elsevier.
6. Ashworth, A. (1999) Cost studies of buildings, Pearson Higher Education

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understanding of storing & handling of different types of materials	PO7
CO2	Knowledge about Estimate of building components, interior, plumbing & electrification installation	PSO2, PSO3
CO3	Acquire Knowledge about detailed estimates & schedule of rates	PO3
CO4	Analyze different types of contracts, tender document for building	PSO5
CO5	Acquiring information on the process of tendering, price rise mechanism and award of tenders	PO5,PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			**1**							**1**		
CO2			**1**						**2**	**2**		
CO3			**3**							**3**		
CO4			**3**							**3**		**2**
CO5			**2**								**3**	**2**
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APEE321A	**BUILDING SERVICES-II (ELECTRICAL & LIGHTING)**	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Understanding services				
Co-requisites	Implementation in design				

Course Objectives

1. To understand the electrical system in domestic and multistoried buildings including lighting, fixtures and fittings, and cabling.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand science behind Lighting.
CO2. Learn to apply prediction methods to assess the functional requirements of buildings.
CO3. Gain knowledge of optimum lighting solutions.
CO4. Able to perform basic room lighting measurements.

CO5. Learn drawing representation details for construction drawings for services

Catalog Description

This course imparts the basic concepts of electrical system in domestic and multistoried buildings including lighting, fixtures and fittings, and cabling.

Course Content

UNIT I: 8 lectures
Introduction to engineering services for buildings
Electrical Services: sources of electrical energy supplied to buildings
Electricity generation, transmission and distribution.
Instruments for measurement, metering
Electricity Authority, Act, rules and regulations

UNIT II: 8 lectures
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

UNIT III: 8 lectures
Electrical lighting
Integration of Electrical lighting with day lighting, sensors
Instruments for measurement lux meters
Type of lamps and luminaries, lighting density and efficiency
Outdoor lighting, Specialized lighting like art galleries etc.

UNIT IV: 8 lectures
Graphical symbols electrical systems
Plug load calculation of a small building
Electrical drawing of a small building

Reference Books/Materials

1. Raina K. B. & Bhattacharya S. K. (2007) Electrical Design, Estimating and Costing, New Age International Publishers, New Delhi.
2. Dagostino, F. R. (1978) Mechanical and Electrical Systems in Construction in Architecture, Reston Publishing Company, Prentice Hill Co., Virgenia.
3. Egan, D. M. (1983) Concepts in Architectural Lighting, McGraw Hill Book Company.
4. Flynn, J. E. et. al (1992) Architectural Interior Systems: Lighting, Acoustics and Air conditioning, Van Nostrand Reinhold
5. NBO (1966) Hand book for Building Engineers, National Buildings Organisation, New Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand science behind Lighting.	PO3, PO4,PO7
CO2	Learn to apply prediction methods to assess the functional requirements of buildings.	PO3,PO4, PO7
CO3	Gain knowledge of optimum lighting solutions.	PO1,PO3, PO4, PO7
CO4	Able to perform basic room lighting measurements.	PO3, PO4, PO7
CO5	Learn drawing representation details for construction drawings for services	PO1, PO2, PO4, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**											
CO2	**3**	**2**	**3**	**1**				**2**		**3**		
CO3	**2**			**2**	**2**				**2**	**3**		**3**
CO4	**3**		**3**	**3**			**3**		**1**	**2**		
CO5	**3**	**3**	**1**	**3**			**3**	**3**	**3**	**2**		
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

SEMESTER VI

APAR318A	ARCHITECTURAL DESIGN-V	L	T	P	C
Version 1.0		0	0	10	10
Pre-requisites/Exposure	Basic Designing				
Co-requisites	Creativity				

Course Objectives

1. Understanding of the design complexities and contradictions to resolve architectural design problems for Housing of different typologies and public buildings.
2. How to design the built environment of Housing/ other public building in urban context/areas.
3. Characteristics of a public building.
4. Understanding the significance of building design in line with local building regulations.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Design for multiple groups of users with due consideration to site, climate services & bye laws.

CO2. Able to gauge the role of density, mixed land use, ground coverage and developmental control needs for the design of housing

CO3. Learn application of basic structure forms in relation to space and materials

CO4. Derive a design process and design solution for a public building/ Housing

Catalog Description

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 dynamics of public buildings; activities of visitors and regular users. Providing for daily/regular, monthly, annual events and activities. Relating space and individual; human scale and urban scale. Societal aspirations for aesthetics and form. Role of climate, building services, construction methods, bye-laws, codes (NBC etc.) on building and site design. Exercises on studies for grouping of activities in a public building. Design (form and space) for multi activity public facility like District Collectorate office, Degree College, Residential School (navodayavidyalaya), corporation office, shopping complex, dharamshala, inns, motels, budget hotels, etc. in small and medium towns.

Course Content

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.

All portfolio to include two drawings showing construction system, structure, materials and services.

Reference Books/Materials

1. Time-Saver Standards for Building Types
2. Architectural Standard Ernst Peter Neufert Architects Data
3. Time-Saver Standards for Architectural Design Data

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Design for multiple groups of users with due consideration to site, climate services & bye laws.	PO1
CO2	Able to gauge the role of density, mixed land use, ground coverage and developmental control needs for the design	PO2, PO3

	of housing	
CO3	Learn application of basic structure forms in relation to space and materials	PO4
CO4	Derive a design process and design solution for a public building/ Housing	PO5, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1	**2**	**2**	**2**	**2**			**1**	**1**	**2**			**1**
CO2	**2**	**3**	**2**	**2**			**2**	**1**				**1**
CO3	**3**	**2**		**1**			**3**	**2**				**1**
CO4			**3**	**2**			**4**	**3**	**2**	**2**	**2**	**2**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR320A	**BUILDING CONSTRUCTION & MATERIALS-VI**	**L**	**T**	**P**	**C**
Version 1.0		**0**	**0**	**5**	**5**
Pre-requisites/Exposure	Detailing				
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.				

Course Objectives

1. To understand the use of some new building materials in building works.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Focus on various building materials and construction techniques based on the performing standards and codes.

CO2. Understand latest trends in practice and usage of new technology/ materials.

CO3. Learn from procuring materials to the manufacturing of products in different industries.

CO4. Understand the constituents, defects, classifications, treatments, preservations and uses of traditional building materials

CO5. Understand the use of building materials in joinery details and complex constructions with higher load capacities.

Catalog Description

To introduce and familiarize the students with constituents, manufacturing process / availability, properties / characteristics, defects, classifications, treatments, preservation and uses of traditional building materials used in construction.

To acquaint the students to building materials such as glass, aluminium, etc. with construction techniques for the use of these materials in building works.

Course Content

UNIT I
M A T E R I A L S: Nonferrous- Aluminum
CONSTRUCTION: Sandwich panels, Aluminum Composite panel- Cladding, partitions, false ceiling

UNIT II
M A T E R I A L S: Glass
C O N S T R U C T I O N: Curtain Glazing, Structural Glazing

UNIT III
M A T E R I A L S: Stone
C O N S T R U C T I O N: Dry stone cladding

UNIT IV
C O N S T R U C T I O N:
Roofs & Trusses contd….:
Construction of domes, vaults and shell roofs;
R.C.C. (Formwork & Laying):
Beams, Columns, Lintel, column grid and frame construction. Slabs-simply supported & cantilevered, flat slab construction, etc.
Note: Assignments could be in the form of market surveys for building materials and study of latest building materials in the building construction industry. Students are also required to do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

Reference Books/Materials

1. Foster, Stroud Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. Singh, Gurucharan Building Construction Engineering, Standard Book House, New Delhi.
3. McKay, W. B. Building Construction (Metric), Longman, London, vol. 1 to 5.
4. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
5. Barry, R Construction of Buildings, London, vol. 1 to 5.
6. Punmia, B. C. Building Construction, Delhi.

WEB REFERENCES:

1. http://en.wikipedia.org/wiki/Building_material
2. www.bmtpc.org/pubs/book12.pdf
3. http://www.habitattechnologygroup.org/

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Focus on various building materials and construction techniques based on the performing standards and codes.	PO4,PO7
CO2	Understand latest trends in practice and usage of new technology/ materials.	PO4,PO7
CO3	Learn from procuring materials to the manufacturing of products in different industries.	PO7
CO4	Understand the constituents, defects, classifications, treatments, preservations and uses of traditional building materials	PO3, PO5, PO7
CO5	Understand the use of building materials in joinery details and complex constructions with higher load capacities.	PO1, PO2, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**			**3**			**3**					**3**
CO2		**2**	**2**	**3**	**2**		**3**			**2**		**3**
CO3			**3**			**2**						**3**
CO4		**2**	**3**					**2**			**3**	
CO5	**2**			**3**	**2**				**2**			
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR336A	**TOWN PLANNING**	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Knowledge of cities, basic design				
Co-requisites	Logical thinking				

Course Objectives

1. Students will have a clear understanding of city and town planning.
2. Understand relevance of different kinds of planning done throughout the years by different planners.
3. The student starts to understand the evolution of cities, materials, concepts etc.
4. Students will 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.
5. Introduction to elementary art and science of town planning including traffic and transportation planning.

6. To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understanding 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.

CO2. Understanding planning principles globally and historically equipped with necessary information on town planning theories, principles, techniques and methodologies.

CO3. Understanding the profession of Planning and the various processes/ scales/stages involved.

CO4. Able to analyze pattern of Urban Growth and System of Cities and apply UDPFI and TCPO guide lines.

Catalog Description

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.

Course Content

UNIT I: Introduction to Principles and Techniques: 8 lectures

- Definition and vocabulary of Town Planning and Regional Planning
- Town planning and architecture, role of a town Planner, Elements and planning principal of city plan.
- Evolution of town planning in India: pre-independence and post-independence

UNIT II: Town planning Terminology, Planning Process & Standards: 8 lectures

- Land use, Concept of F.A.R. and Density, Zoning and Subdivision Regulations, Master Plan.
- Introduction about Professional Bodies in planning profession such as T.C.P.O. and I.T.P.I. etc. 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.
- Planning Process & Standards Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.
- Introduction to Town Planning Schemes, Development Plan and Regional Plan.
- Town planning surveys (Physical, social and Economical, Aesthetic Surveys), Preparation of MASTER PLAN for old and new towns, Planning Standards.

UNIT III: Planning Concepts and Evolution: 8 lectures

- Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broadacre), Garden city (Letchworth), Radburn Theory (Radburn) and Neighborhood planning.

- Planning Theories & Models – Theories by Le Corbusier, Sir Pattrick Geddes, Sir Ebenezer Howard, C. A.Doxiadis, Clarence Perry and Lewis Mumford. – their relevance to Indian conditions.

UNIT IV: Roads and traffic studies Modern Transportation systems: 8 lectures

- 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.
- Shapes of plan in accordance to road networks.
- New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.

UNIT V: Modern approach in Planning: 8 lectures

- Modern approach in Planning Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)

TEXT BOOK:

1. Rangwala, S. C. and Others Town Planning, Charotar Pub. House, Anand.
2. G.K.Hiraskar, Town Planning

REFERENCE BOOKS

1. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van Nostrand Reinhold company.
2. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
3. Kevin Lynch -Image of City.
4. Sir Ebenezer Howard- Tomorrow – Peaceful Path To Social Reforms.
5. URDPFI Guidelines for Planning by TCPO.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc	Attendance	End term exams
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understanding 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.	PO1
CO2	Understanding planning principles globally and historically equipped with necessary information on town	PO2

	planning theories, principles, techniques and methodologies.	
CO3	Understanding the profession of Planning and the various processes/ scales/stages involved.	PO4
CO4	Able to analyze pattern of Urban Growth and System of Cities and apply UDPFI and TCPO guide lines.	PO5, PO6

Programme and Course Mapping												
CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PSO 1**	**PSO 2**	**PSO3**	**PSO4**	**PSO5**
CO1			**3**				**3**					
CO2				**3**			**3**					
CO3			**3**			**2**	**3**			**2**		**3**
CO4		**2**			**2**	**2**	**3**					**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR310A	**WORKING DRAWING & BUILDING BYELAWS**	**L**	**T**	**S**	**P**	**C**
Version 1.0		**0**	**0**	**5**	**0**	**5**
Pre-requisites/Exposure	Understanding basics					
Co-requisites	Drawing skills, implementation in practise					

Course Objectives

1. To understand and making drawing/ details necessary for final execution of a project.
2. To integrate all services and structure system in the working drawing project.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. 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

CO2. Understanding of details at various steps from inception to completion of the project from site visit of construction site

CO3. Understanding of building regulations, National Building Code to enhance knowledge of them apart from studio exercises

CO4. Familiarize with norms on exterior and interior spaces, considerations in FAR and guidelines for open green areas

CO5. To instill the proper definitions for every construction step from plinth, habitable rooms, kitchens and so on for various building typologies

Catalog Description

To introduce Working drawings and their significance in the construction of buildings. To teach students the essential components of working drawings, notations, drawing standards,

strengthen the students' knowledge about preparing working drawings for various building elements.

Course Content

Unit I. Working Drawings
Making complete set of working drawings for the residence or any other project designed by the student. The drawings to incorporate all necessary information complete with schedule and all specifications. The Working
Drawings to include:
1. Site plan.
2. Foundation layout with details of foundations and D.PC.
3. Ground floor Plan.
4. First Floor Plan.
5. Terrace Plan
6. Sections
7. Elevations.

Unit II. Services Drawings
Making complete set of servicesdrawings for the above said project. The drawings to incorporate services details complete with schedule and all specifications. The Services Drawings to include:
1. Electrical Layout.
2. Plumbing Layout.
3. Sanitary Layout.
4. Drainage Layout.
5. Rain Water Disposal / Harvesting Layout and Details.
6. Toilet details.
7. Kitchen / Pantry Details.

Unit III. Working Details
Making complete set of working details for the above said project. The drawings to incorporate details complete with schedule and all specifications.
The Working Details to include:
1. Doors and Windows Drawings and Details.
2. Staircase Details including railings.
3. Details of Grills,Parapet or railings.
4. Typical wall section showing foundation, DPC, skirting, sill, lintel, slab
and terracing details.

Unit IV. Finishing Drawings
Making complete set of finishing drawings for the above said project. The drawings to incorporate finishing details complete with schedule and all specifications. The Finishing Details to include:
1. Doors and Windows Frame and Shutter details.
2. Flooring & Skirting pattern and fixing details.
3. Dado / Wall tile pattern and fixing details.
4. Wall Cladding pattern and fixing details.
5. Plaster Pattern with Colour schemes.

Reference Books/Materials

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction
2. Quality Assessment System.
3. Jefferis, A. and Madsen, D.A. (2005). Architectural Drafting and Design. 5th Ed. New York :
4. Thomson Delmar Learning.
5. Jeong, K-Y. (2010) Architecture Annual. Seoul: Archiworld Co.
6. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria: The Images Publishing group.
7. Osamu, A. W., Linde, R. M. and Bakhoum, N. R. (2011). The professional practice of

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relanship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	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	PO7
CO2	Understanding of details at various steps from inception to completion of the project from site visit of construction site	PSO2, PSO3
CO3	Understanding of building regulations, National Building Code to enhance knowledge of them apart from studio exercises	PO3
CO4	Familiarize with norms on exterior and interior spaces, considerations in FAR and guidelines for open green areas	PSO5
CO5	To instill the proper definitions for every construction step from plinth, habitable rooms, kitchens and so on for various building typologies	PO5,PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**2**	**2**	**2**	**2**			**3**	**2**	**3**	**1**	**2**	**3**
CO2	**2**	**3**	**2**	**3**	**1**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
CO3	**3**	**3**	**2**	**3**		**2**	**3**	**3**	**3**	**3**	**3**	**3**
CO4	**2**	**2**	**2**	**3**		**2**	**3**	**2**	**3**	**2**	**2**	**3**
CO5	**3**	**2**	**3**	**3**		**2**	**3**	**2**	**2**	**3**	**3**	**3**
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APCE332A	STRUCTURAL DESIGN-VI	L	T	S	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Basics of Steel Structures and Mechanics				
Co-requisites	Understanding of different steels structures and their connections				

Course Objectives

1. To introduce the students to the fundamentals of steel design with emphasis on the design of connections – Bolted, Riveted and welded. In addition, student will learn how to analyse, and design tension members and compression members in steel structures and plated beams according to the IS building code requirements.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Understand properties of steel and rolled steel sections.
CO2. Understand load carrying capacity of various connections
CO3. Better understanding of Tension Members and Compression Members.
CO4. Better understanding of supported, unsupported and plated beams.

Catalog Description

The course deals with design of steel structures using "Limit State Design Method". The design methodology is based on the latest Indian Standard Code of Practice for general construction (IS 800:2007). The subject covers all the necessary components such as material specifications, connections and elementary design of structural members for designing industrial steel structures.

Course Content

UNIT I: 8 lectures
- Structural Properties of steel and use of steel as a structural material.
- Classification of rolled steel sections and their properties.

UNIT II: 8 lectures
- Riveted, Bolted & Pinned connection.
- Welded connections.

UNIT III: 8 lectures
- Design of Tension members.
- Design of compression members, lacing & bracing

UNIT IV: 8 lectures
- Analysis and Design of simple Beams & Plated Beams.

TEXTBOOK

Punmia, B. C., Jain, A. K. & Jain, A. K., Comprehensive Design of Steel Structures, Laxmi Publications (P) Ltd., New Delhi.

REFERENCE BOOKS:

1. BIS (1984) Indian Standard Code of Practice for General Construction in Steel IS : 800.
2. Duggal, S. K. Design of Steel Structures, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Singh, H. Analysis & Design of Steel Structures for Architects, Abhishek Publications, Chandigarh.
4. Arya, A. S. & Ajmani, J. L. Design of Steel Structures, Nem Chand & Bros., Roorkee.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand properties of steel and rolled steel sections.	PO1
CO2	Understand load carrying capacity of various connections	PO3
CO3	Better understanding of Tension Members and Compression Members.	PSO2, PO4
CO4	Better understanding of supported, unsupported and plated beams.	PSO2, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**1**								**1**		**1**	
CO2			**1**						**2**			
CO3			**2**						**3**			
CO4			**3**						**3**			**1**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR328A	BUILDING SERVICES III (ACOUSTICS)	L	T	P	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding services				
Co-requisites	Implementation in design				

Course Objectives

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.

Course Outcomes

With the successful completion of the course student should be able to

CO1. Understand the basics of acoustics
CO2. Develop capability to apply the fundamentals of acoustics in the design of building
CO3. Communicate with technical accuracy in a professional and an academic environment

Catalog Description

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

Course Content

UNIT I: 8 lectures
Acoustics

- Introduction to the study of acoustics, basic terminology, sound and distance – inverse square law; absorption of sound, sound absorption co-efficient.
- Reverberation time, Sabines' formula, various sound absorbing materials. Behavior of sound in enclosed spaces, Acoustical defects
- Noise and its types – outdoor and indoor noise, air born noise, structure borne noise, impact noise.
- Noise control at neighborhood and city level.

UNIT II: 8 lectures

- Acoustical design for halls used for drama, music, speech, cinema theatres and open air theatres.
- Acoustical materials and constructional measures of noise control, insulation of machinery, sound insulation.

UNIT III: 8 lectures
Fire Fighting & 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

UNIT IV: 8 lectures

- Fire resisting materials, fire resistant rating
- Concepts in passive fire protection and control – including design of escape routes, pressurization and compartmentation, etc.
- Active fire control using portable extinguishers. Basic concepts in fixed fire fighting installations.
- Automatic fire detection and alarm systems
- Fire preventive techniques, fire protection equipments

Text Books

1. Michaeal Ermann, Architectural Acoustics Illustrated, Wiley.
2. Koenigsberger, O.H; Manual of Tropical Housing and Building: Universities Press, 2010.

Reference Books

1. Catalogues of leading Audio equipment's companies
2. Egan, Architectural Acoustics
3. Kandaswamy, Architectural Acoustics and Noise Control
4. J.E. Moore, Design for Good Acoustics and Noise Control.
5. National Building Code 2005 • Templeton, D., Acoustics in the Built Environment.
6. A.B. Wood, A Text book of sound. • Yarwood, T.M., Acoustics.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term examinations
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand the basics of acoustics	PO1, PO2
CO2	To Develop capability to apply the fundamentals of acoustics in the design of building	PO2, PO3
CO3	To Communicate with technical accuracy in a professional and an academic environment	PO3, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**1**	**-**	**-**	**-**
CO2	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**1**	**-**
CO3	**3**	**2**	**2**	**2**	**3**	**-**	**3**	**-**	**1**	**2**	**1**	**-**
CO4												
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR334A	**AIR CONDITIONING & MECHANICAL SERVICES**	L	T	P	C
Version 1.0		2	0	0	2
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Implementation in design				

Course Objectives

1. To appreciate how buildings can be made more comfortable by adding mechanical systems like artificial ventilation, air conditioning and conveyor systems.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Elementary knowledge of building services: air-conditioning inside buildings.
CO2. Understand methods of air conditioning.
CO3. Understanding of elevators and escalators.
CO4. Understand working of elevators and escalators.

Catalog Description

This course imparts the basic concepts of environment and climate. It enables them to design and enhance a site according to the location, climate and needs of the client. The course introduces the basic concepts about human comfort, ways of achieving it, solar geometry- its implementation in designing buildings as per orientation, shading devices-designing, wind movement patterns around buildings, etc.

Course Content

UNIT I: 8 lectures

- 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 psychometric 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.

UNIT II: 8 lectures
- 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

UNIT III: 8 lectures
- Elevators (Lifts) and escalators
- Brief history-types of Elevators like traction, hydraulic etc. Double decker, 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.

UNIT IV: 8 lectures
- 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
- Introduction to working of escalator and design, escalators location, equipment

Reference Books/Materials

1. Grondzik, WT, Kwok, AG, Stein, B, Reynolds, JS Mechanical and Electrical Equipment for Buildings, Wiley.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Elementary knowledge of building services: air-conditioning inside buildings.	PO3, PO4, PO7
CO2	Understand methods of air conditioning.	PO3, PO4, PO7
CO3	Understanding of elevators and escalators.	PO3, PO4, PO7
CO4	Understand working of elevators and escalators.	PO3, PO4, PO7

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**1**	**-**	**-**	**-**
CO2	**3**	**2**	**1**	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**1**	**-**
CO3	**3**	**2**	**2**	**2**	**3**	**-**	**3**	**-**	**1**	**2**	**1**	**-**
CO4	**3**	**2**	**3**	**3**	**3**	**-**	**3**	**3**	**1**	**2**	**1**	**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR338A	**HUMAN SETTLEMENT**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Logical thinking				

Course Objectives

1. To study the Evolution and Growth of Human Settlements
2. To expose students to the development of Human Settlements in the Indian Context
3. To Critically analyse learning's from development of informal and formal Human Settlements
4. To discuss new and emerging concepts, methods and tools to face new challenges in built environment in Developing countries

Course Outcomes

On completion of this course, the students will be able to

CO1. To generate an understanding about the development of civilizations
CO2. To understand impact of civilization on Habitat.
CO3. Understanding of the periods in terms of their context of location and climate.
CO4. Understanding of the periods in terms of socio-cultural, historical, economic and political influences of the time.
CO5. Understanding the need or demands of the society.

Catalog Description

Focus shall be on learning from growth and development of traditional human settlements.
Aspects affecting their evolution and socio-cultural and other related aspects.
Learning through case studies and literature studies along with relevant site visits shall be preferable.

Course Content

Unit I. Evolution and Development of Human Settlements: 8 lectures

- Origin and Growth of Human Settlements, River Banks as carriers to growth of Human Settlements; River valley Settlements: Greek, Roman, Medieval, Renaissance and Modern.

Unit II. Human Settlements in India: 8 lectures

- Human Settlements in India since the ancient to medieval and Modern periods. Factor affecting their development and extinction: Socio- Cultural, Disasters and Environmental Aspects.

Unit III. Study and Analysis of Informal and Formal Settlements: 8 lectures

- Detailed Analysis of selected informal and formal human settlements in the world and India for deriving learnings for contemporary usage especially in the context of efficient management of Resources, Solid Waste Management, Sustainability and Preservation of Cultural Practices.

Unit IV. Establish criteria for contemporary Sustainable human settlements: 8 lectures

- A critical evaluation and discussion of new emerging concepts methods and tools, and cases like Masdar City, Auroville for upcoming challenges in human settlements for developing countries.

Reference Books/Materials

1. Water Conservation Techniques in Traditional Human Settlements by Pietro Laureano.
2. Human Settlements: The Environmental Challenge. A compendium of United Nations papers prepared for the Stockholm conference on Human Environment 1972.
3. The Evolution of Human Settlements from Pleistocene Origins to Anthropocene Prospects by Bowen, William M., Gleeson, Robert E.
4. History of human settlements and urban design from the early ages to the end of the 19th century (Council of Planning Librarians. Exchange bibliography) Unknown Binding – 1969 by Gideon Golany
5. Evolution of human settlements in India by S.P. Chatterjee
6. Human Settlements and Planning for Ecological Sustainability: The Case of Mexico City by Keith Pezzoli John Friedmann.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc	Attendance	End term exams
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To generate an understanding about the development of civilizations	PO3
CO2	To understand impact of civilization on Habitat	PO7
CO3	Understanding of the periods in terms of their context of location and climate	PS05
CO4	Understanding of the periods in terms of socio-cultural, historical, economic and political influences of the time	PO5,PO6
CO5	Understanding the need or demands of the society	PSO5

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			**3**				**2**			**2**		**3**
CO2			**3**				**2**			**2**		**3**
CO3			**3**				**2**			**2**		**3**
CO4			**3**				**2**			**2**		**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

SEMESTER VII

APAR419A	ARCHITECTURAL DESIGN-VI	L	T	S	C
Version 1.0		0	0	10	10
Pre-requisites/Exposure	Conceptualization and functioning of Buildings				
Co-requisites	Integration of Services, Structural and Construction systems				

Course Objectives

1. To enable the students to apply the knowledge learnt in the previous semesters in architectural design, construction and building services.
2. To sensitize the students to space-specific contextual factors in designing.
3. To sensitize the students to the special needs of the differently abled people, suffering from various types of physical limitations, as they negotiate the built environment.
4. To integrate structural, construction and services with design of buildings.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Understand Service based Design projects like Hospitals, Hotels, Airports, Transportation Hubs, and Commercial Complexes.

CO2. Create Portfolios which include presentation drawings, construction systems, materials and services.

CO3. Create Architectural models of structural forms and important aspects of functionality.

CO4. Apply all bye laws including fire safety norms for the building.

Catalog Description

Students are expected to understand structure forms in relation to space and materials and integrate structural and construction 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’.

Course Content

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.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand Service based Design projects like Hospitals, Hotels, Airports, Transportation Hubs, and Commercial Complexes.	PO1, PO2, PO3, PO4
CO2	Create Portfolios which include presentation drawings, construction systems, materials and services.	PO1, PO2
CO3	Create Architectural models of structural forms and important aspects of functionality.	PSO1, PSO2 PO1
CO4	Apply all bye laws including fire safety norms for the building.	PO1

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											
CO2	**3**											
CO3			**2**									
CO4		**2**						**2**				
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR421A	BUILDING CONSTRUCTION AND MATERIALS -VII	L	T	P	S	C
Version 2.0		0	0	0	5	5
Pre-requisites/Exposure	Detailing					
Co-requisites	Observation, drawing skills, maintaining journals for construction materials.					

Course Objectives

1. To introduce and familiarize the students with advanced and speedy building techniques.
2. The understanding for the system to be adopted for the construction of large span structures.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand Prefabrication/ Precast Techniques
CO2. Modern construction systems and techniques used in large scale buildings and other architectural projects.
CO3. Understand design and use of innovative & low-cost construction techniques.

Catalog Description
To introduce to large span components/ Techniques and construction details.

Course Content

UNIT I
Prefabrication: Systems – open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.

UNIT II
Pre-stressed Concrete: Introduction, methods of pre-stressing and their application to large space structures.

UNIT III
Speedy Construction: Mivan technology, Ciporex construction, Dry walling, Dryconstruction techniques

UNIT IV
Innovative and low cost construction techniques-
Techniques using recycled waste materials like PET bottles, glass bottles, wooden planks, cardboards, etc.
Techniques using bamboo, coir, glass fibre, polymers, flyash etc.

Note: Assignments could be in the form of market surveys for building materials and study of latest building materials in the building construction industry. Students are also required to

do case studies of architectural and interior projects where the above-mentioned materials have been innovatively used.

Reference Books:

1. Foster, Stroud Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.
2. Singh, Gurucharan Building Construction Engineering, Standard Book House, New Delhi.
3. McKay, W. B. Building Construction (Metric), Longman, London, vol. 1 to 5.
4. Prabhu, Balagopal T. S. Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
5. Barry, R Construction of Buildings, London, vol. 1 to 5.
6. Punmia, B. C. Building Construction, Delhi.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term Studio Exam	End Term External Jury
Weightage (%)	20	30	20	30

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand Prefabrication/ Precast Techniques	PO1,PO2
CO2	Modern construction systems and techniques used in large scale buildings and other architectural projects.	PO2, PO3
CO3	Understand design and use of innovative & low-cost construction techniques	PO2,P04

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**			**3**			**3**					**3**
CO2		**2**	**2**	**3**	**2**		**3**			**2**		**3**
CO3			**3**			**2**						**3**
CO4		**2**	**3**					**2**			**3**	
CO5	**2**			**3**	**2**				**2**			
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR431A	PROFESSIONAL PRACTICE & OFFICE MANAGEMENT	L	T	P	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Logical thinking				

Course Objectives

1. To introduce the understanding of Architect office management & legal understanding of various Architects Act of 1972 with professionalism in field of Architecture relating to various practical aspects with field visit & tour.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understand his role, responsibilities and code of conduct as an architect
CO2. Develop an understanding of the role
CO3. Learns how to setup and run office.

Catalog Description

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

Course Content

UNIT 1: 8 lectures

- Role of Professional Bodies:
- IIA -The Indian Institute of Architects, its working constitution and byelaws, categories of membership, election categories
- 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

UNIT 2: 8 lectures

- 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.

UNIT 3: 8 lectures

- Arbitration: Arbitration, Arbitrator, Umpire, Nature, of arbitration, Appointment,Conduct,

- Powers, and duties of arbitrators and umpires; Procedure of arbitration and preparation of awards.

UNIT 4: 8 lectures

- Office management: Architectural office, architect, contractor, client relationships, Office correspondence, filing and record keeping, Human resource management.

Reference Books

1. Council of Architecture Website :coa.gov.in
2. Publications of Council of Architecture-Architects (Professional conduct) Regulations; 1989.
3. Madhav Deobhakta, Architectural Practice in India
4. Architects Act; 1972.
5. Roshan Namavati, Professional Practice

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understand his role, responsibilities and code of conduct as an architect	PO1, PO3
CO2	To Develop an understanding of the role	PO3, PO4
CO3	To Learns how to setup and run office.	PO3, PO4

Programme and Course Mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1					**3**						**2**	**3**
CO2					**2**	**3**						**3**
CO3							**3**					**3**
CO4												**3**
CO5												
CO6												
CO7												

1=lightly mapped 2= moderately mapped 3=strongly mapped

APEE425A	PROJECT CONSTRUCTION MANAGEMENT	L	T	P	C
Version 1.0		**2**	**0**	**0**	**2**
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Logical thinking				

Course Objectives

1. To establish an understanding of how construction industry operates including the project life cycle and participants involved.
2. To introduce the principles of project management and its functions.
3. To provide the students with essentials of construction management including procurement, planning, estimating, and scheduling.
4. To familiarize students with measuring and managing performance in construction.
5. To present and discuss some tools to improve performance at project and organizational level.
6. To increase the awareness of students on the emerging issues and advanced processes in construction
7. Introduction & definition of Project construction management
8. Project functions, planning process.
9. Project work breakdown, Modeling and analyzing networks and work scheduling process.
10. Bar charts and Mile stone charts. Network analysis fundamentals, CPM Network analysis procedure. PERT - Network, Time estimates, Probability Distribution, Critical Path,
11. Slack and Probability of achieving completion date.
12. Project cost analysis - Cost versus time, Contracting the Network etc.
13. Resource Allocation - Resource Smoothing and Resource Leveling. Updating the network based on the project progress.
14. Computer applications in construction management – using MS Projects software for project planning, scheduling and control.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Able to identify engineering properties of aggregate.
CO2. Able to identify the grade & properties of bitumen
CO3. Able to know various hierarchical levels of transport planning.
CO4. Able to analyse and use standard and locally available matter for roads.
CO5. Learning to employ computer applications in construction management using MS Projects based on project progress.

Catalog Description

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.

Course Content

UNIT I: 8 lectures
Introduction & definition of Project construction management
Project functions, planning process.
Project work breakdown, Modelling and analyzing networks and work scheduling process.

UNIT II: 8 lectures
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.

UNIT III: 8 lectures
Resource Allocation - Resource Smoothing and Resource Levelling. Updating the network based on the project progress.

UNIT IV: 8 lectures
Computer applications in construction management – using MS Projects software for project planning, scheduling and control.

Text Books

1. Col. Prof Harbhajan Singh, "Construction Project Management", Abhishek Publications, Chandigarh, 2009
2. Dr B.C Punmia, Building Construction

Reference Books/Materials

1. Srinath, L.S., "PERT and CPM - Principles and Applications", Affiliated East - West Press Pvt. Ltd., New Delhi, 1989.
2. Stevens, James. D., "Techniques for Construction Network Scheduling", McGraw - Hill Publishing Company, New York, 1990.
3. Mukhopadhyay,S.P., "Project Management for Architects and Civil Engineers", Firma KLM Pvt. Ltd., Calcutta, 1981

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Able to identify engineering properties of aggregate.	PO3, PO4,PO7
CO2	Able to identify the grade & properties of bitumen	PO3,PO4, PO7
CO3	Able to know various hierarchical levels of transport planning.	PO3, PO4, PO7
CO4	Able to analyse and use standard and locally available matter for roads.	PO3, PO4, PO5, PO7
CO5	Learning to employ computer applications in construction management using MS Projects based on project progress.	PO3, PO4, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1		**2**		**2**	**1**		**1**		**3**		**3**	
CO2				**2**	**1**		**1**				**3**	
CO3	**3**		**3**	**2**	**1**		**1**				**3**	
CO4			**3**				**1**				**3**	
CO5			**3**			**2**	**1**				**3**	
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR427A	**ELECTIVE-I (Site Planning & Landscape Design)**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**1**	**0**	**3**
Pre-requisites/Exposure	Basic Designing				
Co-requisites	Implementation in design				

Course Objectives

1. Students will have a clear understanding of the term site planning and landscaping.
2. Understand relevance of site planning and landscape.
3. Insight into the profession of Landscape Architect and the agencies involved.
4. Enhancing insight into the process of site planning and landscaping and the different models and tools used in it.

Course Outcomes

On completion of this course, the students will be able to

CO1. Understand site planning, landscape design and its relevance in Architecture.

CO2. Understand the movement of Landscape architecture globally and historically

CO3. Understand the profession of landscape Architect and various processes/ stages involved.

CO4. Understand typical problems and addressing those in landscape design, all the stakeholders involved. Learn about different landscape architects also.

Catalog Description

This course imparts the basic concepts of site planning and landscape design. It enables them to design and enhance a site according to the location, climate and needs of the client. The course of site planning and landscape design helps the students in understanding local and international styles of landscaping and tools which help in dealing with different kinds of concepts. The course introduces the basic concepts about different types of gardens, cultures, trees, tools, site planning models, geology, soil and different kinds of architects and landscape designers and how they have dealt with different sites.

Course Content

Unit I: 12 lectures

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.

Unit II: 12 lectures

- Site plan preparation, site and program analysis, conceptualization, master plan drawings and section graphics.

Unit III: 12 lectures

- 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.

Unit IV: 12 lectures

- 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.
- 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.

Text Books

1. Thomas H Russ, Site Planning and Design Handbook,2009, McGraw Hill, New York

Reference Books/Materials

1. Lynch Kevin, Hack Garry, Site Planning, The MIT press, 1984
2. Elizabeth Boults, Chip Sullivan, Illustrated History of Landscape Design, 2010, John Wiley & Sons, Inc.
3. James A. Lagro Jr., Site Analysis, John Wiley & Sons, Inc., 2013
4. Thames & Hudson, Tropical & Subtropical Trees - a worldwide encyclopaedic guide, Margaret Barwick Publishers, 2004
5. Nancy Rottle & Ken Yocom, Basics-- Landscape Architecture 02 -- Ecological Design, Ava Publishing SA, 2010
6. John O. Simonds and Barry W. Starke, Landscape Architecture , A manual of Environmental Planning & Design, McGraw-Hill, 2006

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc	Attendance	End term exams
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understanding site planning and landscape design in context of architecture.	PO1
CO2	Understanding how landscaping design has loved globally and historically	PO2
CO3	Understanding the profession of a landscape architect and the various stages involved.	PO4
CO4	Understanding the problems of landscape architecture.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**2**		**3**	**2**			**3**			**3**		**2**
CO2	**2**		**3**	**2**			**3**			**3**		**2**
CO3			**3**	**3**			**3**			**3**		**2**
CO4			**3**	**3**			**3**			**3**		**2**
CO5			**3**	**3**			**3**			**3**		**2**
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR513A	ELECTIVE-II (Interior Design)	L	T	P	C
Version 1.0		2	1	0	3
Pre-requisites/Exposure	Basic knowledge of design				
Co-requisites	Creativity				

Course Objectives

1. To understand relevance of Interior design in the field.
2. To develop understanding about Interior design, its principles and elements in any space.
3. To understand Vastu shashtra , a cosmic science to see, its integration in any project
4. To get an insight about famous Interior designer works and their philosophy

Course Outcomes

On completion of this course, the students will be able to

CO1. Gaze relevance of the subject in the field and various future prospects.

CO2. Understand interior design principles and elements and their application in any space.

CO3. Understand importance of Vastu shashtra in Interior projects and able to apply them in any space.

CO4. Appreciate famous interior designer's work and their philosophy to get more insight about the subject

Catalog Description

The course imparts an understanding of basic principles and elements of interior design of any space and the material used within. The idea shall 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 overall scheme of it. 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 of any space.

Course Content

Unit I: 12 lectures

- Definition of Interior design, Role of an Interior designer and future prospectus.
- Understanding various spaces like living spaces, retail spaces, work spaces, public spaces, transient spaces etc. with respect to Interior design. Material exploration for space making elements like wall, floor, ceiling

Unit II: 12 lectures

- Interior space design with focus on furniture, day light and artificial light, indoor plants and material usage to understand overall impact of above mentioned elements on any space.

Unit III: 12 lectures

- Works of great masters in the field and their philosophies, modern trends of interior design focus on furniture design, color application and automation of fixtures in order to save energy.

Unit IV: 12 lectures

- Definition of Vastu shashtra, its basic principles and its application in any interior space.

Please note: 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.

Reference Books/Materials

1. Kasu A Ahmed 2005,Inside Design ,6TH Edition, Om Publishers
2. Joseph Dechiara , Julius Panero , Martin Zelnik,Time-Saver Standards for Interior Design and Space Planning, II Edition, McGraw Hill Education
3. Francis D. K. Ching , Architectural Graphics 2009, 5th Edition ,Wiley
4. Premavathy Seethe & Raman Parveen Pannu ,Interior Design & Decoration CBS Publishers & Distributors Pvt. Ltd, 2005. Francis D. K. Ching , Corky Binggeli, Interior Design Illustrated 2012 John Wiley & Sons; 3rd Revised edition edition

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Continuous Assessment test	Mid-term examinations	Quizzes/Tutorials/ Assignment etc	Attendance	End term exams
Weightage (%)	10	20	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To gaze relevance of the subject in the field and various future prospects.	all
CO2	To understand interior design principles and elements and their application in any space.	PO1, PO4, PO7, PSO1, PSO3, PSO5
CO3	Understand importance of Vastu-shashtra in Interior projects and able to apply them in a space.	PO1, PO4, PO7, PSO5
CO4	To get an insight about famous Interior designer works and their philosophy	PO1, PO2, PO7, PSO2, PSO3

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**						**3**					
CO2		**3**					**3**					
CO3			**3**				**3**					**3**
CO4				**3**		**3**	**3**			**3**		**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR519A	**ELECTIVE-II (PARAMETRIC DESIGN)**	**L**	**S**	**T**	**P**	**C**
Version 1.0		**1**	**0**	**2**	**0**	**3**
Pre-requisites/Exposure	Learning softwares					
Co-requisites	Drawing skills enhancement					

Course Objectives

1. To understand the recent development of parametric design in architecture both as a discourse and as a tool
2. To provide a brief yet systematic conceptual framework to parametric design in contemporary architectural practices
3. To develop in students' basic skills in using parametric tools such as Grasshopper

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Understanding different elements of Parametric Design
CO2. Knowledge about Geometric Modeling
CO3. Acquire Knowledge about Parametric Modeling Techniques and Tools
CO4. Learning softwares like Rhino, Grasshopper or equivalent
CO5. Acquiring information on the process of Digital Fabrication
CO6. Learning plugins for simulation

Catalog Description

This course aims to prepare students to modeling geometry through scripted development of parametric schemes for architecture applications — that is, to introduce students to basic scripting with a focus on algorithms relating to form making and to reinforce and extend basic concepts of parametric modeling

Course Content

Unit I. Elements of Parametric Design and Design Patterns: 10 lectures

- Introduction to Parametric design, Historical development of parametric design,The structure of parametric design processes, their characteristics and reusable parametric design approaches

Unit II. Fundamental Concepts of Geometric Modeling: 10 lectures

- Spatial coordinates, Projections, Boolean operations, Formal transformations, Freeform surface creation, Surface development and deformations aimed at architecture applications, Discretization and meshing, Digital prototyping and

geometry reconstruction. Concepts in computational geometry applied to parametric architectural geometry modeling.

Unit III. Parametric Modeling Techniques and Tools: 10 lectures

- Introduction of tools for model design parametrically to illustrate the construction of geometrical relationships among complex shapes. Focus on hands-on techniques that can be applied to the design process, to extend the efficiency and productivity of work during the process.
- Use of softwares like Rhino, Grasshopper or equivalent

Unit IV. Digital Fabrication: 9 lectures

- Using 3D digital modeling to efficiently produce components without the need for 2D representation.

Unit V. Parametric Design & Environment: 9 lectures

- Use of Ladybird and honeybee plugins for simulation.

Reference Books/Materials

1. Gips, James. "Computer implementation of shape grammars." In NSF/MIT workshop on shape computation, vol.55, p. 56. Cambridge, MA: Massachusetts Institute of Technology, 1999.
2. Piker, Daniel. "Kangaroo: form finding with computational physics." Architectural Design 83, no. 2 (2013): 136-137.
3. Ingels, Bjarke. Hot to cold: an odyssey of architectural adaptation. No. 72: 504 72: MedioAmbiente. BIG Bjarke Ingels Group., 2015.
4. Schumacher, Patrik. "Parametricism: A new global style for architecture and urban design." Architectural Design 79, no. 4 (2009): 14-23.
5. Sakamoto, Tomoko, ed. From control to design: parametric/algorithmic architecture. Actar-D, 2008.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/Tutorials/ Assignment 1	Attendance	End term exams
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Understanding different elements of Parametric Design	PO1
CO2	Knowledge about Geometric Modeling	PO3,PO7
CO3	Acquire Knowledge about Parametric Modeling Techniques and Tools	PO6
CO4	Learning softwares like Rhino, Grasshopper or equivalent	PO2,PSO3
CO5	Acquiring information on the process of Digital Fabrication	PO4,PSO5
CO6	Learning plugins for simulation	PO5

SEMESTER VIII

APAR402A	PROFESSIONAL TRAINING	L	T	P	C
Version 1.0		0	0	0	18
Pre-requisites/Exposure	Practical learning				
Co-requisites	Designing, site and drawing coordination				

Course Objectives

1. To offer students an opportunity to work in an architect's office and get acquainted with the demands of the profession.
2. Improve communication and analytical skills for handling the assigned task.
3. Able to create portfolio which include two sets of drawings showing construction system and materials, services and architectural presentation drawings.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Practical Training which is to be undertaken with an architect registered with the Council of Architecture.

CO2. The student will perform duties under an architect with minimum professional experience of ten years le to gauge the role of density, mixed land use, ground coverage and developmental control needs for the design of housing.

CO3. 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.

CO4. The duration will be of 22 weeks of inducting and discharging of duties by the student

CO5. An exposure to the processes and challenges of designing within constraints of time is learnt.

Catalog Description

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

Course Content

The 22 week 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

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	End Term Internal Jury	End Term External Jury
Weightage (%)	50	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Practical Training which is to be undertaken with an architect registered with the Council of Architecture.	PO1
CO2	The student will perform duties under an architect with minimum professional experience of ten years le to gauge the role of density, mixed land use, ground coverage and developmental control needs for the design of housing.	PO2, PO3
CO3	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.	PO4
CO4	The duration will be of 22 weeks of inducting and discharging of duties by the student	PO5, PO6
CO5	An exposure to the processes and challenges of designing within constraints of time is learnt.	PO5, P07

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1		**2**	**3**	**3**	**2**	**3**	**3**	**2**				**2**
CO2		**2**		**3**	**3**	**3**	**2**			**2**	**2**	**2**
CO3		**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**2**		**2**
CO4					**3**		**3**					**3**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

SEMESTER IX

APAR521A	URBAN DESIGN	L	T	P	C
Version 1.0		0	0	10	10
Pre-requisites/Exposure	Designing				
Co-requisites	Creativity				

Course Objectives

1. Understanding design as a process of problem identification, space standards, formulation of requirements, evolution of design criteria and development of design of buildings in urban context, phasing and development
2. Understanding relationship of buildings amongst themselves and with a given environment
3. Incorporating the agenda of building bye laws, structure, site planning and landscape and services within existing context

Course Outcomes

On successful completion of this course, the students have capability to

CO1. Learn to formulate a vision
CO2. Formulate a suitable alternative development paradigm.
CO3. Able to do documentation of urban area
CO4. Able to do analysis of urban area
CO5. Find out urban issues through detailed site analysis
CO6. Address the urban issues that have been identified through urban design intervention
CO7. Understand the need of the people and propose the development which will amalgamate/ merge with the existing fabric of the area

Catalog Description

To introduce urban design as a professional discipline situated at the interface between architecture, landscape architecture and urban planning; to sensitize the students about the concept of public realm, understanding of the city as a three dimensional entity and perception of spaces at multiple scales; familiarize with the implementation processes through various statutory and non-statutory guidelines.

Course Content

Introduction to Urban Design

Unit I. Introduction and Scope

- Relationship between Architecture, Urban Design and Urban Planning; Brief review of the evolution of the urban design as a discipline, basic principles and theories.
- Broad understanding of urban forms and spaces at various spatial scales through examples from historic cities

Unit II. Typologies and Procedures

- Concepts of public and private realm; understanding different types and procedures of urban design interventions their scale relationships; constraints and challenges of urban design in democratic versus authoritarian settings

Unit III. Elements of Urban Design

- Understanding the city as a three-dimensional element; Urban form as determined by interplay of masses, voids, order, scale, harmony, symmetry, colour and texture; Organization of spaces and their articulation in the form of squares, streets, vistas and focal points; Concept of public open space; Image of the city and its components such as edges, paths, landmarks, street features

Unit IV. Urban Design and Sustainability

- Sustainability concept; Relationship of urban design with economic, environmental and social sustainability; Urban renewal and urban sprawl; Concepts of Transit Oriented Development, Compact City, Healthy City and Walkable City

Unit V. Urban Design Implementation

- Urban design and its control; Institutional arrangements for design and planning, their roles, powers and limitations; Types of planning instruments, structure plans, master plans and local area plans and zoning guidelines; Design communication and role of public participation.

Design Stages

- Introduction
- Understanding the importance of 'context' and built urban environment in design and lessons to be learnt in contextual insertions.
- Study and Analysis
- Examining an existing urban environment for establishing parameters that influence contextual insertion within that fabri
- Design Proposal
- Design of multi-utility buildings /campus / complexes incorporating the constraints derived from the context it is placed in

Suggested Studio Exercises

- Study of a given urban fabric with underlying context
- Urban Intervention Projects: Design of buildings / building complexes in specific urban contexts such as heritage zones, near existing and within built environments
- Development of projects containing group of buildings with multiplicity of constraints such as relationship of land uses, space, architectural character, circulation, movement landscape and buildings
- The exercises such as redevelopment and urban improvement projects shall be generated after understanding the existing physical, socio-cultural, economic and political context surrounding activities etc

Approach

- Design methodology shall take precedence over design
- Model of existing site and context shall be prerequisite for design insertions
- Part of project may be done in groups to develop teamwork and multi-faceted approach to design

Reference Books/Materials

1. Architecture Today
2. Concept to the manifest

3. Projects of various Architects of similar nature

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Learn to formulate a vision	PO1
CO2	Formulate a suitable alternative development paradigm	PO2, PO3
CO3	Able to do documentation of urban area	PO4
CO4	Able to do analysis of urban area	PO5, PO6
CO5	Find out urban issues through detailed site analysis.	PO3, PO7
CO6	Address the urban issues that have been identified through urban design intervention.	PO3, PO7
CO7	Understand the need of the people and propose the development which will amalgamate/ merge with the existing fabric of the area.	PSO5

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**											
CO2			**2**									
CO3		**3**						**3**				
CO4		**3**										
CO5						**3**				**3**		
CO6							**3**					
CO7					**3**							**3**
1=lightly mapped			2= moderately mapped				3=strongly mapped					

APAR519A	**DISSERTATION**	**L**	**T**	**S**	**C**
Version 1.0		**0**	**0**	**6**	**6**
Pre-requisites/Exposure	Basic knowledge of research				
Co-requisites	Communication skills				

Course Objectives

1. 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.

2. They start understanding the subject by investigating relevant case studies, data collection and the existing literature which can be from book or web.
3. Then they are expected to present their research/ data orally and graphically.
4. This will help them to improve their analytical and presentation skills.

Course Outcomes

On completion of this course, the students will be able to

CO1. Present data (conceptual, historical, analytical, and comparative or in any other area related to Architecture & habitat) at all stages during the entire semester.

CO2. Identification of an appropriate and focused research topic reflecting social and technological needs of the day.

CO3. Formulate synopsis including objectives, scope of work, methodology of work, case studies to be undertaken, site selection culminating in broad functional requirements.

CO4. An investigation of the topic using an analysis of existing literature, case studies and other data sources.

CO5. Develop understanding of the research topic

CO6. Able to do find out conclusions from the research

CO7. Ability to carry out independent viewpoint in interpretation and analysis.

CO8. Present the submission for all stages in print and digital mode.

Catalog Description

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.

Course Content

The dissertation shall entail the following:

• Identification of an appropriate and focused research topic reflecting social and technological needs of the day.

• Formulate synopsis including objectives, scope of work, methodology of work, case studies to be undertaken, site selection culminating in broad functional requirements.

• An investigation of the topic using an analysis of existing literature, case studies and other data sources.

• To develop understanding of the research topic.

• Conclusions from the research

The dissertation shall be based on empirical study, field work, and textual analysis in the field of urban and rural planning. It should demonstrate candidate's capacity for analysis and judgment as also her/his ability to carry out independent viewpoint in interpretation.

The dissertation shall present an orderly & critical exposition of existing knowledge of the subject or shall embody results of original interpretation and analysis & demonstrate the capacity of the candidate to do independent research work. While writing the dissertation, the

candidate shall lay out clearly the work done by her/him independently and the sources from which she/he has obtained other information.
The dissertation shall be well structured document with clear objectives, well-argued and appropriate conclusions indicating an appropriate level of expertise. The submission format for all stages shall be print and digital. Seminars in related areas to the dissertation topic (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.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid term Jury	End term Internal Jury	End term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Present data (conceptual, historical, analytical, and comparative or in any other area related to Architecture & habitat) at all stages during the entire semester.	PO1
CO2	Identification of an appropriate and focused research topic reflecting social and technological needs of the day.	PO2
CO3	Formulate synopsis including objectives, scope of work, methodology of work, case studies to be undertaken, site selection culminating in broad functional requirements.	PO4
CO4	An investigation of the topic using an analysis of existing literature, case studies and other data sources.	PO5, PO6
CO5	Develop understanding of the research topic	PO1
CO6	Able to do find out conclusions from the research	PO2
CO7	Ability to carry out independent viewpoint in interpretation and analysis.	PO4
CO8	Present the submission for all stages in print and digital mode.	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			**3**									**1**
CO2				**3**								**1**
CO3					**3**	**3**	**3**					**2**
CO4				**3**		**3**						**3**
CO5							**3**					**3**
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR407A	ELECTIVE-III (ARCHITECTURAL CONSERVATION)	L	T	S	C
Version 1.0		**2**	**1**	**0**	**3**
Pre-requisites/Exposure	Historical Context and significance of Buildings				
Co-requisites	Integration of legislation, approaches, materials to intervene in historical precincts				

Course Objectives

1. To bring in an awareness of the value of natural and historical heritage and sensitize students to the issues of conservation.
2. It is an initiation course for students who might wish to take up conservation as a specialization in future.
3. 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.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. Have knowledge about different aspects involved in sustainable integrated conservation.

CO2. Understand the full range of conservation tools, incentives, legislation and rules.

CO3. Able to make wise decisions with respect to conservation strategies and interventions.

Catalog Description

Students understand the full range of conservation 'tools' and 'incentives' to use them as means for achieving satisfactory conservation outcomes and make wise decisions with respect to conservation strategies and interventions.
Students are introduced to the multidisciplinary nature of conservation, so as to ensure development of 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.

Course Content

UNIT I: 12 lectures

- Definition of conservation and its socially accepted meanings, objectives.
- Theories, Principles and concepts of conservation and its application. –
- Legislation in conservation.

UNIT II: 12 lectures

- History of conservation movement in the world and Indian response to the movement.

- History of Indian conservation movement. –
- Study through various examples in world on same.

UNIT III: 12 lectures

- Causes of Decay in Cultural property, External causes of Decay, Biological & Botanical causes, Natural disasters & Man made causes of decay, Remedies for these decay.
- The context of inspecting historic building – Inventory – Initial inspections of buildings – continuing Documentation, norms for grading and enlisting.

UNIT IV: 12 lectures

- Actual conservation techniques for relevant building materials. Some specifications & instruction about parts of buildings. Such as foundations walls, chhajjas, wall tops, roofs & terraces with various examples of conservation practiced globally.
- Discuss work of conservation architects - Research, analysis, presentation

Text book [TB]:

1. Sir Bernard M. Feilden; Conservation of Historic Buildings, Architectural Press, London.
2. Sir Bernard M. Feilden; Guidelines for conservation; Architectural Press, London.

Reference book(s) [RB]:

1. A.G. K. Menon & B. K. Thapar; Heritage Zones
2. Xavier Greffe; Managing our Cultural Property; Aryan Book International, New Delhi. Robert Pickard; Policy involved in Heritage Conservation;
3. Conservation in India: Architecture + Design; A Journal for the Indian Architect, Vol VI No 1, Nov Dec 1989.
4. William Dalrymple; City of Djinns; Bloomsbury Publishing India, New Delhi; 2017.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Class Test 1	Presentation 1	Class Test 2	Presentation 2	Attendance	End Term Exam
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	Knowledge about different aspects involved in sustainable integrated conservation.	PO3, PO4
CO2	Understand the full range of conservation tools, incentives, legislation and rules.	PO1, PSO2
CO3	Able to make wise decisions with respect to conservation strategies and interventions.	PO1, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**				**2**							
CO2		**3**								**3**		
CO3			**3**									**2**
CO4				**3**			**2**					**2**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped					3=strongly mapped				

APAR413A	**ELECTIVE-II (SUSTAINABLE ARCHITECTURE)**	**L**	**T**	**P**	**C**
Version 1.0		**2**	**1**	**0**	**3**
Pre-requisites/Exposure	Understanding basics				
Co-requisites	Logical thinking				

Course Objectives

1. 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
2. Understanding of Buildings context using Passive design features
3. Better understanding of techniques of Sustainable tools

Course Outcomes

On successful completion of this course, the students have capability to

CO1. To have understanding the various principles of Sustainable Architecture
CO2. To enhance l thinking to correlate various techniques of sustainability.
CO3. To Enhancing deep insight of Building contexts.

Catalog Description

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

Course Content

UNIT I : 12 lectures

- Brief introduction of Sustainable Development & Architecture
- Definitions, Principles, Challenges and responses.
- Millennium Development Goals
- Culture lifestyle and sustainability – Overview of Indian Culture and Ancient cultures of the world in context of reverence of nature and ecological systems.

UNIT-II: 12 lectures

- Sustainable Architecture

- Definitions and Principles
- Environmental Impact of Buildings
- Sustainable design priorities
- Cultural and economic aspects
- Basics of Lifecycle Design
- Selected Examples of sustainable Architecture- Vernacular, Historical and ContemporaryBuildingS

UNIT-III: 12 lectures

- Energy Conservation through design of built forms- passive design strategies for energy consumption.
- (Examples of current building projects)

UNIT-IV: 12 lectures

- Introduction to Low Impact Design Strategies
- Available sustainability measuring tools in World and India. (Overview)- LEED, GRIHA & IGBC, .ECBC

Text Books

1. Koenigsberger, O.H , Ingersoll, T.G. < Mayhew, A Szokolay, S.V. , 1973. Manual of Tropical Housing and BUilding Part1. Climatic Design, Orient Longman Pvt.Ltd.
2. Arvind Krishnan & Others – Climate Responsive Architecture, Tata Mcgraw –Hill New Delhi 2001

Reference Books

1. Mili Majunder, Teri – Energy – Efficient Bldg. in India – Thomson Press, New Delhi – 2001
2. J.K Nayak & Others , Energy Systems Energy Group,- Isa Annal Of Passive Solar Architecture.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	TEST 1	TEST 2	Quizzes/Tutorials/ Assignment 1	Quizzes/ Tutorials/ Assignment 2	Attendance	End term examinations
Weightage (%)	10	10	10	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To have understanding the various principles of Sustainable Architecture	PO1, PO3

CO2	To Enhance l thinking to correlate various techniques of sustainability.	PO3, PO4
CO3	To Enhancing deep insight of Building contexts.	PO3, PO4

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**2**						**3**					**1**
CO2				**3**						**2**		**2**
CO3			**2**							**2**		**3**
CO4	**2**			**2**		**2**	**3**			**2**		**2**
CO5												
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					

SEMESTER X

APAR520A	ARCHITECTURAL THESIS	L	T	S	C
Version 1.0		**0**	**0**	**10**	**18**
Pre-requisites/Exposure	Completion of All Design Studios till Semester VIII, Urban Design, Professional Practice				
Co-requisites	Integration of Services, Structural and Construction systems with Design				

Course Objectives

1. To understand the context and validate the need for a particular topic/ on-going project as Thesis topic.
2. To independently understand and analyse the design brief, site conditions, bye laws, context and limitations of the design project and propose a concept design
3. To enable the students to apply the knowledge learnt in the previous semesters in architectural design, construction and building services.
4. To sensitize the students to space-specific contextual factors in designing.
5. To sensitize the students to the special needs of the differently abled people, suffering from various types of physical limitations, as they negotiate the built environment.

Course Outcomes

On successful completion of this course, the students have capability to:

CO1. To independently understand and analyse the design brief, site conditions, bye laws, context and limitations of the design project and propose a concept design.

CO2. Understand the process of presenting an architectural project in totality with full set of drawings, model, research work and details explaining the background study, design brief, context and culmination of the entire research and design process.

CO3. Create Architectural models of structural forms and important aspects of functionality.

CO4. Apply all bye laws including fire safety norms for the building.

CO5. To independently complete the graduation project and transition into professional practice smoothly.

Catalog Description

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.

Course Content

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 l shalfurther 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 models.

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination/Jury

Examination Scheme:

Components	Internal Jury	External Jury
Weightage (%)	50	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs

	Course Outcomes (COs)	Mapped Program Outcomes
CO1	To independently understand and analyse the design brief, site conditions, bye laws, context and limitations of the design project and propose a concept design.	PO1, PO2, PO3, PO4
CO2	Understand the process of presenting an architectural project in totality with full set of drawings, model, research work and details explaining the background study, design brief, context and culmination of the entire research and design process.	PO1, PO2
CO3	Create Architectural models of structural forms and important aspects of functionality.	PSO1, PSO2 PO1
CO4	Apply all bye laws including fire safety norms for the building.	PO1
CO5	To independently complete the graduation project and transition into professional practice smoothly.	PO4, PSO4, PSO5

Programme and Course Mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	**3**			**3**				**3**				
CO2	**3**			**3**					**2**	**3**		**3**
CO3		**3**	**3**	**3**						**3**	**2**	**3**
CO4				**3**	**2**					**3**		**3**
CO5						**3**	**3**				**2**	**3**
CO6												
CO7												

1=lightly mapped 2= moderately mapped 3=strongly mapped

APAR522B	SEMINAR	L	T	S	P	C
Version 2.0		0	0	5	0	5
Pre-requisites/Exposure	Research and development					
Co-requisites	Logical thinking					

Course Objectives

1. To understanding basic principles of any research with special reference to architectural research and applications.
2. To write a technical paper of about 6000 words with original input.

Course Outcomes

On successful completion of this course, the students have capability to

CO1. The students will know how to analytically look and assess a site and a topic

CO2. The students will learn how to do research based on the basic research methodology

CO3. The students visit the site and learn the practicalities of the same

CO4. By the end of the semester, students are expected to submit a paper of approximately 6000 words

CO5. Students must adhere to Standard referencing conventions and technical writing norms

Catalog Description

This shall be the outcome of a logical research on a topic related to any aspect of Architecture and allied subjects. It is expected that the students will demonstrate effective oral presentation in a hall of audience, as well as structured writing.

Approach

Students may choose a topic related to theory / philosophy / current issues related to architecture and allied subjects. The topics must be vetted by the subject teacher/s. The emphasis must be on critical understanding, logical reasoning, structured argument / discussion about the topic chosen.

Unit I. Introduction

- Learning the formulation of research question or hypothesis

Unit II. Writing a technical research paper

- Writing a paper of 6000 words in following stages:
- Formulation of an original research issue by ascertaining the gaps in research
- Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope,
- Methodology.
- Structuring the body of the paper in detail
- Ascertaining Primary and Secondary Sources
- Referencing in Harvard Style
- Utilizing the sources to reach to the desired objectives
- Editing the paper.
- Students are encouraged to get their research papers published in indexed journals.

Reference Books/Materials

1. Raman Meenakshi and Sharma Sangeeta, “Technical Communications – Principles and Practices”, Oxford UniversityPress, New Delhi

2. Kate L.Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination
Examination Scheme:

Components	Mid Term Jury	End Term Internal Jury	End Term External Jury
Weightage (%)	20	30	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Program Outcomes
CO1	The students will know how to analytically look and assess a site and a topic	PO3, PO7
CO2	The students will learn how to do research based on the basic research methodology	PO4, PO7
CO3	The students visit the site and learn the practicalities of the same	PO1, PO5
CO4	By the end of the semester, students are expected to submit a paper of approximately 6000 words	PO4, PO6
CO5	Students must adhere to Standard referencing conventions and technical writing norms	PO5, PO6

Programme and Course Mapping												
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1			**3**	**2**	**3**		**3**				**1**	
CO2			**3**	**2**			**3**				**1**	
CO3			**3**	**2**		**2**	**3**				**1**	
CO4				**3**		**3**	**3**				**3**	**3**
CO5				**3**	**3**						**3**	**3**
CO6												
CO7												
1=lightly mapped			2= moderately mapped				3=strongly mapped					