ANNA UNIVERSITY, CHENNAI
AFFILIATED INSTITUTIONS
B.ARCH.
REGULATIONS – 2017
CHOICE BASED CREDIT SYSTEM
I & II SEMESTERS CURRICULA AND SYLLABI

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

Bachelor of Architecture curriculum is designed to prepare the graduates having aptitude and knowledge

1. To facilitate a successful professional career.
2. To imbibe a strong foundation in Humanities and Sciences, Engineering Sciences and Architectural Design Skills.
3. To appreciate the theories and practices in the field of Architecture and design.
4. To update themselves abreast of new developments in the field of architecture through life-long learning.
5. To emulate and inspire high ethical values in professional practice.

PROGRAMME OUTCOME (PO):

1) Ability to gain knowledge of Humanities, Sciences, Engineering Sciences and Architecture.
2) Ability to understand elements of Architecture and apply basic principles in Architectural Design.
3) Ability to identify social, economical environmental and cultural issues that have bearing on the Architectural Design Process.
4) Ability to analyze and apply theoretical knowledge to achieve Architectural Design solutions.
5) Ability to understand ethical and professional responsibilities.
6) Ability to review, comprehend and report technological developments in the profession of architecture and construction.
7) Ability to understand real life situation of Architectural Practice.
8) Ability to communicate effectively and work in interdisciplinary groups.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOME:

A broad relation between the programme objectives and the outcome is given in the following table

PEO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
1						√	√	√
2	√		√	√				
3		√	√	√	√			
4						√	√	√
5					√		√	√

		COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
YEAR I	SEMESTER I	History of Architecture and Culture I			√					
		Mathematics	√							
		Architectural Drawing I	√							
		Art Studio	√							
		Communication English						√		
		Basic Design		√						
		COURSE TITLE	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**
YEAR I	SEMESTER II	Theory of Architecture				√				
		Mechanics of Structures I	√							
		Architectural Drawing II	√							
		Building Materials and Construction I				√		√		
		Model Making and Architectural Delineation		√					√	
		Architectural Design I		√						√

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SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P/S	C
THEORY								
1.	AR8101	History of Architecture and Culture I	HS	3	3	0	0	3
2.	MA8102	Mathematics	BS	4	2	2	0	3
THEORY CUM STUDIO								
3.	AR8121	Architectural Drawing I	ES	5	1	0	4	3
4.	HS8121	Communication English	PAEC	4	2	0	2	3
STUDIO								
5.	AR8111	Art Studio	HS	6	0	0	6	3
6.	AR8112	Basic Design	PC	12	0	0	12	6
			TOTAL	**34**	**8**	**2**	**24**	**21**

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P/S	C
THEORY								
1.	AR8201	Theory of Architecture	PC	3	3	0	0	3
2.	AR8202	Mechanics of Structures I	ES	4	2	2	0	3
THEORY CUM STUDIO								
3.	AR8221	Architectural Drawing II	ES	5	1	0	4	3
4.	AR8222	Building Materials and Construction I	PC	5	1	0	4	3
STUDIO								
5.	AR8211	Model Making and Architectural Delineation	PC	6	0	0	6	3
6.	AR8212	Architectural Design I	PC	12	0	0	12	6
			TOTAL	**35**	**7**	**2**	**26**	**21**

AR8101 HISTORY OF ARCHITECTURE AND CULTURE I

L	T	P/S	C
3	0	0	3

OBJECTIVES:

- To inform about the development of architecture in the Ancient Western World and the cultural and contextual determinants that produced that architecture.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate.
- To gain knowledge of the development of architectural form with reference to Technology, Style and Character in the prehistoric world, Ancient Egypt, West Asia, Greece , Rome, Medieval times and Renaissance period.

UNIT I WISDOM OF THE ANCIENTS THRO RIVER VALLEY CIVILIZATION 07

Response to culture and context in building shelter in the Neolithic period- R. Nile and the architecture of Egypt with relevant examples – Urban form in the Indus Valley and the Tigris and Euphrates basin and relevant examples of architecture.

UNIT II CLASSICAL WORLD 10

Landscape and culture of Greece –Greek character – Greek polis and democracy – Domestic architecture– Evolution of the Greek temple and the building of the Acropolis –Public architecture: Theatre and Agora- optical illusions in architecture- City Planning.

Roman history: Republic and Empire –Religion, culture, lifestyle - Roman character – Roman urban planning –architecture as imperial propaganda: forums and basilicas – structural forms: materials and techniques of construction spanning large spaces with relevant examples - domestic architecture.

UNIT III EARLY CHRISTIANITY AND CHRISTIAN KINGDOMS 10

Birth and spread of Christianity – transformation of the Roman Empire – early Christian worship and burial. Church planning – Basilica concept and Centralized plan concept with relevant examples in the West and in the Byzantine.

The Carolingian Renaissance – Feudalism and rural manorial life – Papacy – Monasticism – Craft and merchant guilds. Medieval domestic architecture – Romanesque churches with relevant examples in Europe – Development of vaulting.

UNIT IV THE AGE OF CHURCH BUILDING 08

Development of Gothic architecture Church plan, structural developments in France and England with using relevant examples of church architecture in Europe – wooden roofed churches.

UNIT V IDEA OF RE-BIRTH AND RENAISSANCE IN EUROPE 10

Idea of rebirth and revival – Humanism –Development of thought – Reformation- the Renaissance patron – Urbanism Renaissance architecture: Brunelleschi and rationally ordered space – ideal form and the centrally planned church using relevant examples– palace and villa architecture with relevant examples – Mannerist architecture- The Renaissance in transition – works of Michelangelo; Sir Christopher Wren, Andrea Palladio, Inigo Jones- Baroque and palace building in France.

TOTAL: 45 PERIODS

OUTCOMES:

- An understanding about the spatial and stylistic qualities associated with architecture.
- An Understanding of architecture as an outcome of various social, political and economic upheavals, and as a response to the cultural and context.

TEXTBOOKS:

1. Sir Banister Fletcher, A History of Architecture, CBS Publications (Indian Edition), 20th Edition 2002.
2. Spiro Kostof – A History of Architecture – Setting and Rituals, Oxford University Press, London, 1986.
3. Francis D.K. Ching et al; A global history of Architecture; John Wiley's sons, 2nd edition 2010.

REFERENCES:

1. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Westview press, 3rd revised edition; 2014.
2. S. Lloyd and H.W. Muller, Ancient Architecture: History of World Architecture – Series, Phaidon Press, London, 2004.
3. Gosta, E. Samdstrom, Man the Builder, McGraw Hill Book Company, New York, 1970.
4. Bussagh; Marco; Understanding Architecture; I.B.Tauris & co. Ltd; 2005.

MA8102	MATHEMATICS	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- Identifying practical problems to obtain solutions involving trigonometric and exponential functions.
- Studying the properties of lines and planes in space, along with sphere and providing a tool too.
- Understand 3D material.
- Understand functions of more than one variable, along with differentiation under integral sign.
- Solving differential equation of certain type.
- Analyzing data collection and interpretation of results using statistical tools.

UNIT I TRIGONOMETRY AND MENSURATION 12

Trigonometric (sine, cosine and tan functions) and exponential functions, De-Moiver's theorem. Area of plane figures, computation of volume of solid figures.

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY 12

Direction cosines and ratio's – Angle between two lines – Equations of a plane – Equations of a straight line – Coplanar lines – Shortest distance between skew lines – Sphere – Tangent plane – Plane section of a sphere.

UNIT III INTEGRATION AND FUNCTIONS OF TWO VARIABLES 12

Integration of rational, trigonometric and irrational functions, properties of definite integrals, Reductions formulae for trigonometric functions, Taylor's Theorem - Maxima and Minima (Simple Problems).

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS 12

Linear equations of second order with constant coefficients – Simultaneous first order linear equations with constant coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form.

UNIT V BASIC STATISTICS AND PROBABILITY 12

The arithmetic mean, median, mode, standard deviation and variance - Regression and correlation - Elementary probability - Laws of addition and multiplication of probabilities - Conditional probability – Independent events.

TOTAL: 60 PERIODS

OUTCOMES:

- The aim of the course is to develop the skills of the students in architecture. The students will be trained on the basis of the topics of Mathematics necessary for effective understanding of architecture subjects. At the end of the course, the students would have an understanding of the appropriate role of the mathematical concepts learnt.

TEXTBOOKS:

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition, 2011.

REFERENCES:

1. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
2. Ramana B.V., "Higher Engineering Mathematics", Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2010.
3. Greenberg M.D., "Advanced Engineering Mathematics", Pearson Education, New Delhi, 2nd Edition, 5th Reprint, 2009.
4. Gupta S.C and Kapoor V.K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 9th Edition,1996.

AR8121	ARCHITECTURAL DRAWING I	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To understand drawing as a medium to visualize and communicate design ideas.
- To understand the concepts of Architectural Drawing with the introduction of drafting fundamentals.
- To understand the language of Architectural representations through Architectural Drawing systems.
- To introduce the basics of measured drawing.

UNIT I GEOMETRICAL DRAWING: INTRODUCTION TO DRAFTING 10

Introduction to fundamentals of drawing/ drafting: Construction of lines, line value, line types, lettering, dimensioning, representation, format for presentation, use of scales etc. Construction of lines and angles, construction of triangles, circles, tangents, curves and conic sections.

UNIT II PLANE GEOMETRY AND SOLID GEOMETRY 20

Construction and development of planar surface – square, rectangle, polygon etc. Introduction of multi- view projection – projection of points, lines and planes. Multi- view projection of solids – cube, prism, pyramids, cones, cylinders etc. Sections of solids, true shape of solids.

UNIT III ARCHITECTURAL DRAWING SYSTEMS 10

Communicating Architectural Design Ideas from Concept to Construction - Case studies of Architect's Sketches translated as Drawing systems – Types of Projection systems and Pictorial systems – Types of Pictorial systems such as Multi view, Para line and Perspective drawings.

UNIT IV MULTIVIEW AND PARALINE DRAWINGS 15

Principles of Orthographic views – Reading multi view drawings - Representing materials in Architectural Design and Construction drawings – Drafting of Building Components in Plans – Elevations – Sections through Case studies of Architects' drawings – Construction of Para line drawings – Isometric and Axonometric.

UNIT V MEASURED DRAWING 20

Introduction to fundamentals of measured drawing, format for presentation methods - Techniques of measuring buildings and their details –Measured drawing of simple objects like furniture, ornamentation, measured drawing of building components like column, door, window, cornice, etc. isometric projections of simple construction details of the building components.

TOTAL: 75 PERIODS

OUTCOMES:

- Understanding on the concepts of architectural drawing as well as representation skills is imparted.
- Understanding on the building representation in 2D and 3D among students in addition to preparation of measured drawing.

TEXTBOOKS:

1. I.H.Moris, Geometrical Drawing for Art Students; Universities Press 2012.
2. Francis D. K. Ching, "Architectural Graphics", John Wiley and Sons, 2009.

REFERENCES:

1. Francis D.K.Ching with Steven P.Juroszek, "Design Drawing" John Wiley & Sons, Inc. Second edition, reprint 2012.
2. Fraser Reekie, Reekie's, "Architectural Drawing", Edward Arnold, 1995.
3. Scidler & Korte; Hand drawings for Designers - Communications ideas through area graphics; Four child books NY; 2012.

HS8121	COMMUNICATION ENGLISH	L	T	P/S	C
		2	0	2	3

OBJECTIVES: The English Language Course for students of architecture would,

- Enhance their communication skills in English by developing their listening, speaking, reading and writing skills.
- Develop their speaking skills with specific reference to prospective/actual clients, suppliers, business partners and colleagues.
- Enhance their reading particularly, rules and regulations, catalogues, architecture journals and textbooks.
- Develop their writing skills especially writing emails, proposals and reports.

UNIT I INTRODUCTION 10

Listening- short talks, interviews and discussions from various media Speaking-negotiating meaning, convincing people- describing places- Reading- texts on architecture-Writing-process descriptions -Vocabulary Development-Abbreviations and Acronyms. Grammar-Suitable tenses to write descriptions and describe.

UNIT II SPEAKING, READING AND WRITING 10

Listening –listen to talks for specific information- Speaking- Speaking- preparing a presentation using the computer, participating in small group discussion- Reading- lengthy articles related to architecture and construction Writing- writing formal emails **,** vocabulary-appropriate words to describe topics in architecture, Grammar- suitable grammar for writing a report.

UNIT III DESCRIPTIVE PRESENTATION 10

Listening- Descriptions of place, conversations and answering questions, Speaking- making a power point presentation on a given topic, Reading- architecture manuals, Writing- writing a report, writing essays-descriptive essays, Vocabulary- adjectives of comparison, Grammar-collocations.

UNIT IV ANALYTICAL PRESENTATION 15

Listening- TED talks, Speaking- participating in group discussions, Reading- reading and interpreting visual information, Writing- writing analytical essays and argumentative**,** Vocabulary- suitable words to be used in analytical and argumentative essays, Grammar-subject-verb agreement.

UNIT V PROJECT PROPOSAL PRESENTATION 15

Listening- ink talks and longer talks, Speaking- talking about one's project proposal, Reading- reading essays on construction, buildings, different schools of architecture, Writing-writing proposals, Vocabulary- related vocabulary, Grammar- Cohesive devices.

TOTAL: 60 PERIODS

OUTCOMES:

- Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
- Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for method of presentation.
- Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
- Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.

TEXTBOOKS:

1. English for Architects and civil Engineers - Sharon Hendenreich Springer, 2014 ISBN 978-3-658-030-63- (e-book).
2. www.cambridgescholars.com
3. www.robertdwatkins.com/Englishworkbook.pdf
4. arkenglish.

REFERENCES:

1. Chris Mounsey: **Essays and Dissertation** (Oxford University Press) February 2005.
2. Sidney Greenbaum: **The Oxford English Grammar** (Oxford University Press) March 2005.
3. Krishna Mohan and Meera Banerji: **Developing Communication Skills** (Mac Millan india Ltd)[2000].
4. Krishna Mohan and Meenakshi Raman: **Effective English Communication** (Tata Mc-Graw Hill)[2000].

AR8111 **ART STUDIO** **L T P/S C**
0 0 6 3

OBJECTIVES:

- To develop presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials.
- To familiarize the students with the various mediums and techniques of art through which artistic expression can be achieved
- To involve students in a series of exercises which will look at graphic and abstract representations of art
- To sensitize students to the grammar of visual perception by involving them in a series of free hand exercises to understand form, proportion, scale, figure ground etc.,

UNIT I BASICS OF DRAWING 15

Introduction to Drawing through various period of History - Seeing (Observation / Proposition / Scale / Texture through study of still life and natural objects), Visualizing (Memory Drawing / Exploratory Drawing), Expressing (Qualities of Lines / Drawing tools and Quality of Expressions – Pen, Pencil, Charcoal, Marker) – Abstraction and communication (Sketching and Free hand perspective Drawing)

UNIT II DRAWING FROM OBSERVATION 15

The processes of seeing, Imagining and Representing - Observations on Line and Shape - Observation on Tone and Texture - Observations on Form and Structure - Observations on Space and Depth - Sketching Exercises related to the contents specified above.

UNIT III GRAPHIC DESIGN 15

Introduction to history of Graphic Design – Visual perception theory (Gestalts) – Principle of Compositions – Colour Theory – Type Design and Typography (Layouts / Format / Calligraphy) – Environmental Graphics (Signage / Logo / enhancing the built environment) – Exercises in environmental graphic design, color and composition

UNIT IV PAINTING 15

Introduction to Art / Artists' / Movements and Styles before and after industrial revolution and its implication on design and architecture – Mediums, Techniques and Tools (Water colours / Posters / Acrylic / Inks / Brushes / Knives / Mixed Media) - Exercises using various techniques and mediums

UNIT V CULTURE - CRAFT - TECHNOLOGY 30

Understanding Culture and Craft – Understanding Craft and Technology – Material exploration (Wood / Metal / Clay / Printing) - to be Explored as Workshop Modules - Print Making / Wood Carving / Clay Sculpting / Casting / Sheet Metal etc.,

TOTAL: 90 PERIODS

OUTCOMES

- The students are exposed to various mediums, techniques and tools.
- The students gain mastery in sketching, visualizing and expression through manual drawing.
- Sensitized to culture, craft and context.
- Skill Development in Handling Materials and in Making Products.

REQUIRED READINGS

1. Webb, Frank, "The Artist guide to Composition", David & Charles, U.K., 1994.
2. Ching Francis, "Drawing a Creative Process", Van Nostrand Reinhold, New York, 1990.
3. Alan Swann, "Graphic Design School", Harper Collins, 1991.
4. Envisioning Architecture – an analysis of drawing , Iain Fraser & Rod Henmi, 1991

REFERENCES

1. Moivahuntly, “The artist drawing book”, David & Charles, U.K., 1994.
2. Arundell (Jan) Exploring sculpture, Mills and Boon, London/Charles, T. Brand Ford Company, U.S.A.
3. The art of drawing trees, heads, colours, mixing, drawing, landscape and painting, water colour oil colour, etc. – The Grumbacher Library Books, New York, 1996.
4. Caldwell peter, “Pen and Ink Sketching”, B.T. Bats ford Ltd., London, 1995.

AR8112	BASIC DESIGN	L	T	P/S	C
		0	0	12	6

OBJECTIVES:

- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises that will develop originality, expression, skill and creative thinking.
- To involve students in a number of exercises to understand the grammar of Design and Visual composition.
- To enable the understanding of 3D Composition by involving students in a number of exercises which will help generation of a form from a two dimensional / abstract idea.
- To understand architecture as a craft, of making and of putting together.
- To sensitize students to materials both planar and plastics and Processes involved in working with them.
- To draw inspiration and clues from nature.
- To introduce Drawing as an analytical tool.
- To introduce students to History of Design and craft.

CONTENT:

Introduction to Spatial Design, Form and Structures through Basic Design – Elements of Design: Properties, qualities and characteristics of point, line, direction shape, form, colour and texture – Principles of Design: Scale, Proportion, Balance, Harmony, Rhythm and Contrast. – Concepts of Visual perception – Material and processes.

The course shall be conducted by giving a number of exercises in the form of Design studios, Seminars and Creative workshops that are aimed at teaching the following:

- Elements and Principles of Visual Composition and Pattern making.
- Exploring Colour theories and their application in a Visual composition.
- Study of texture and schemes of texture both applied and stimulated and their application.
- Material and Form / Structures – Nature based enquiry into form both Linear and Planar, fluid and plastic forms using simple material like Mount Board, metal foil, box boards, wire string, thermocol, clay, plaster of Paris etc.
- Study of Solids and voids to evolve sculptural forms and spaces using specific process oriented methods like casting, mouldings etc.,
- Analytical appraisal of an iconic Design like a rietvelt chair, Eames chair etc., for form, function, visual characteristics, ergonomics etc. /evolution of a craft.
- Analytical appraisal of building form in terms of visual character, form and function, play of light and shade, solids and voids, colors and texture.

TOTAL: 180 PERIODS

OUTCOMES:

- An understanding of the qualities of different elements as well as their composite fusions.
- An ability to engage and combine the elements of design in spontaneous as well as intentional ways in order to create desired qualities and effects.
- Development of required skills – observation / analysis / abstractions / interpretation / representations / expressions through models and drawings.
- Understanding by making.

TEXTBOOKS:

1. Owen Cappleman & Michael Jack Jordon, Foundations in Architecture: An Annotated Anthology of Beginning Design Project, Van Nostrand Reinhold New York, 1993.
2. Charles Wallschlacgerm & Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, McGraw Hill, New York 1992.

REFERENCES:

1. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1973.
2. Francis D. K. Ching - Architecture - Form Space and Order Van Nostrand Reinhold Co., (Canada), 1979.
3. Elda Fezei, Henry Moore, Hamlyn, London, New York, Sydney, Toronto, 1972.
4. C. Lawrence Bunchy - Acrylic for Sculpture and Design, 450, West 33rd Street, New York, N.Y. 10001, 1972.
5. Exner. V, Pressel. D, Basics Spatial Design, Birkhanser, 2009.

AR8201	THEORY OF ARCHITECTURE	L	T	P/S	C
		3	0	0	3

OBJECTIVES:

- To understand that architecture is a dynamic interface between man and his environment: through its constituent aspects and elements.
- To understand the various principles of architectural design, with which the above objective is attained.
- To understand that architecture is communicative medium involving aspects of expression and experience.
- To understand the various possibilities of approaching architectural design, through examples from historical and contemporary examples.

UNIT I ARCHITECTURE - ITS ELEMENTS 9

Defining Architecture; an overview of the complexities of various layers and factors involved in Architecture. - Architecture as an organic entity and its components - function, form, structure, skin, material, circulation, character etc. - Architecture as a building entity and its elements - floor, walls, columns, roof, openings, stairs, etc; - their definition, evolution, attributes and spatial roles - Form/space making and its elements - points, lines, planes and volume; Various configuration of these elements in space making.

UNIT II NATURE AND MAN - ARCHITECTURE AS AN INTERFACE 9

Nature - its five basic elements - earth (material, site, vegetation etc), water (rain, humidity etc), fire (light, temperature, radiation), wind (ventilation), sky (space); The dynamic interactions between elements of nature and elements of architecture - Human being - the five basic senses - their role in perception of built environment - vision (light, color, views etc), hearing (sound, noise, silence), tactility (texture, thermal and physical feeling), smell, spiritual. --- The Functional, psychological and aesthetic relevance in architecture - The demonstration of architecture as an experiential interface between human senses and his environment --- explained with relevant Architectural examples. Case studies of relevant architectural examples and exercises.

UNIT III ARCHITECTURAL DESIGN - ITS PRINCIPLES 9

Introduction to Design; A brief overview of design and its principles in other fields. (Arts, crafts, nature etc); Architectural design - its tools (elements), objectives (experience and expression) and means (principles) - Principles of Design - proportion, scale, order, repetition, rhythm, harmony, balance, emphasis, hierarchy, symmetry, axis, datum etc; Application of design principles at various levels - site level, building level and detail level - Evolution of architectural form - Basic 3d forms, Transformation of form, principles involved - space, spatial relationships and spatial organization, principles involved. --- Relevant examples from modern and traditional architecture. Case studies of relevant modern and traditional architectural examples and exercises.

UNIT IV EXPRESSION AND EXPERIENCE IN ARCHITECTURE 9

Architecture as an expressive medium, semiotics involved in various elements, aspects, and principles of architecture; Examples of spatial narratives - Experiencing architecture - Aspects influencing the experience and expression - place, people, society, culture, history, tradition, time etc. Case studies through works of architects.

UNIT V CONCEPTS IN ARCHITECTURE 9

Conceptualizing architecture, various approaches - Understanding Concepts behind the various architectural manifestations in relevant traditional, historical, vernacular examples - Understanding Concepts, ideas, philosophy behind the works of few architects choosing from the modern, post modern and contemporary periods in the context of the West and India.

TOTAL: 45 PERIODS

OUTCOMES:

- A thorough understanding on the definition of architecture; elements of architectures of form.
- An exposure to the principles of architecture and applications of the same in buildings and spaces.
- An understanding the meaning of character and style of buildings with examples.
- An exposure to students on ideologies and philosophies of architectures of contemporary.
- An exposure to analysis and experience of architecture through case studies and architects through examples.

TEXTBOOKS:

1. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, Analysing Architecture, Routledge, London, 2003.
3. Yatin Pandya, "Elements Of Space Making", Mapin Publishing Pvt. Ltd, 2014.
4. V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi, 1997 - 3rd edition.

REFERENCES:

1. Eri J. Jenkins; Drawn to Design - Analyzing Architecture through Free Hand Drawing; BV GMbH Basel; 2013. (available in an EPVB ebook edition)
2. McCarter & Pallasmaa; Understating Architecture - A Prime on Architecture as Experience; Phaidon Press; 2012.
3. Clark and Pause; Precedents in Architecture - Analytic Diagrams, Formative Ideas & Parts; Wiley; 2012.
4. Juhani Pallasmaa; the Eyes of the skin: Architecture & the senses;Wiley 3rd edition; 2012.

AR8202	MECHANICS OF STRUCTURES I	L	T	P/S	C
		2	2	0	3

OBJECTIVES:

- To make students aware of how structural resolutions are important in realization of architectural design concept. At this stage, students shall be exposed to forces, moments, and resolution of forces.
- To make the students understand basic properties of solids and sections which influence their behavior under the effect of various types of forces.

UNIT I FORCES AND STRUCTURAL SYSTEMS 16

Principles of statics- Forces and their effects-Types of force systems - Resultant of concurrent and parallel forces--Lami's theorem- principle of moments -Varignon's theorem - principle of equilibrium –Types of supports and loadings –Determination of reactions for simply supported beams - simple problems.

UNIT II ANANLYSIS OF PLANE TRUSSES 12

Analysis of plane trusses **-** Introduction to Determinate and Indeterminate plane trusses - Analysis of simply supported and cantilevered trusses by method of joints and method of sections.

UNIT III PROPERTIES OF SECTION 12

Properties of section -Centroid- Moment of Inertia - Section modulus – Radius of gyration - Theorem of perpendicular axis - Theorem of parallel axis –simple problems.

UNIT IV ELASTIC PROPERTIES OF SOLIDS 10

Elastic properties of solids –concept of stress and strain –deformation of axially loaded simple bars-types of stresses- Concept of axial and volumetric stresses and strains. (excluding composite bar).

UNIT V ELASTIC CONSTANTS 10

Elastic constants –Elastic Modulus-Shear Modulus- Bulk Modulus-Poisson's ratio - Relation between elastic constants - Application to problems.

TOTAL: 60 PERIODS

OUTCOMES:

- Apply the concepts of action of forces on a body and should be able to apply the equilibrium concepts.
- Students are taught basic geometric properties and the behavior of materials under effect of forces.

TEXTBOOKS:

1. R.K.Bansal – A text book on Engineering Mechanics, Lakshmi Publications, Delhi, 2005.
2. R.K.Bansal – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

REFERENCES:

1. P.C.Punmia, Strength of Materials and Theory of Structures; Vol. I, Lakshmi Publications, Delhi 1994.
2. S. Ramamrutham, Strength of Materials – Dhanpatrai & Sons, Delhi, 1990.
3. W.A.Nash, Strength of Materials – Schaums Series – McGraw Hill Book Company, 1989.
4. R.K. Rajput – Strength of Materials, S. Chand & Company Ltd. New Delhi 1996.

AR8221	ARCHITECTURAL DRAWING II	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To involve students in a number of exercises that will help them develop the skill of representation in advance drawing techniques involving perspective and sciography.
- To involve students in a number of exercises that will help to understand the measured drawing method to document buildings of architectural interest using simple and advance techniques of representation.

UNIT I PERSPECTIVE METHODS 15

Introduction to the concept of perspective drawing. One point and two point perspective of simple geometrical shapes like cube, prism, combination of shapes using picture plane method and measuring point method. Introduction to three point perspective.

UNIT II PERSPECTIVE: BUILDING INTERIOR 10

Construction of one, two and three-point perspective grids - Construction of one and two point perspective of building interiors. Understanding the basic human proportion and scale. Adding of human figures, planters, furniture etc. in an interior perspective scene. Basic applications of shade and shadows and rendering techniques.

UNIT III PERSPECTIVE: BUILDING EXTERIOR 15

Principles of shade and shadow – construction of shadow of simple geometrical shapes – construction of sciography on building, shadows of architectural elements.
Introduction to short cut perspective method. Construction of one, two and three point perspective of building exterior. Adding of human figures, trees etc., Application of light and shadow and rendering techniques of building materials.

UNIT IV MEASURED DRAWING: HISTORIC DOCUMENT STUDY 20

Documentation and drawing of a simple historic building along with the relevant study of the building based on its history, morphology and context. Measured drawing using pen and ink rendering technique.

UNIT V MEASURED DRAWING: BUILDING DOCUMENTATION 15

Complete documentation of a building of special interest in terms of building construction, architectural excellence or technology using photographs, tapes etc. Measured drawing of plans, elevations, sections, isometric projections of building details etc. using pen and ink rendering technique.

TOTAL: 75 PERIODS

OUTCOMES:

- Ability to construct the 3d views and perspective drawings of the buildings.
- Understanding of advanced documentation and measured drawing techniques.

TEXTBOOKS:

1. Francis D. K. Ching; Design Drawing; John Wiley & Sons; 2010
2. Rerdow Yee; Architecture Drawing - A Visual Compendium of Types & Methods; John Wiley & Sons; 2012

REFERENCES:

1. John Montague; Basic Perspective Drawing - A Visual Approach; John Wiley & Sons; 5th edition 2010.
2. Mo Zell; The Architecture Drawing Course - Understand the principles & master the practices; Thames & Hudson; 2014

AR8222	BUILDING MATERIALS AND CONSTRUCTION I	L	T	P/S	C
		1	0	4	3

OBJECTIVES:

- To have an understanding of the properties, characteristics, strength and application of naturally occurring building materials such as Stone, Bamboo, Lime and Mud.
- To study the principles of designing components of load bearing structures – foundation, plinth, wall, openings etc. with naturally occurring building materials.

UNIT I BUILDING MATERIALS 10

Introduction to Building materials – Naturally occurring building materials such as Stone, Bamboo, Lime and Mud – Characteristics and Applications

UNIT II BUILDING COMPONENTS – 01 – FOUNDATIONS 20

Introduction to Building Components – Foundations – Foundations suitable for construction with stone, bamboo, lime and mud – Exercises on Foundations in History and Today's context.

UNIT III BUILDING COMPONENTS – 02 - WALLS 20

Introduction to Building Components – Walls – Walls suitable for construction with stone, bamboo, lime and mud – Exercises on Walls in History and Today's context.

UNIT IV BUILDING COMPONENTS – 03 – OPENINGS / FENESTRATIONS 15

Introduction to Building Components – Openings – Openings/Fenestrations suitable for construction with stone, bamboo, lime and mud – Exercises on Openings / Fenestrations in History and Today's context.

UNIT V FINISHES 10

Introduction to Finishes – Paints, Plastering, Glazes and Varnishes – Exercises on different finishes in History and Today's context for building components with stone, bamboo, lime and mud – Market survey of Paints, Plastering materials, Glazes and Varnishes.

TOTAL: 75 PERIODS

OUTCOMES:

- Students learn construction details using naturally occurring building materials such as stone, bamboo, mud and lime through drawing as well as doing a literature or live case study. Students are to submit drawing plates comprising of technical plan, elevation and section along with sketches and details showing method of construction.

TEXTBOOKS:

1. Arora S.P. and Bindra S.P., "Text book of Building Construction", Dhanpat Rai & Sons, New Delhi, 2012.
2. Klans Dukeeberg, Bambus – Bamboo, Karl Kramer Verlag Stuttgart Germany, 2000.
3. National Building Code Of India 2005- Part 6 Structural Design- Section 3 Timber and Bamboo.
4. Francis D.K. Ching, Building Construction Illustrated John Wiley & Sons 2000.

REFERENCES:

1. Ghanshyam Pandya, M.P. Ranjan, Nilam Iyer Bamboo and Cane Crafts of Northeast India; National Institute of Design (2004).
2. Don A. Watson Construction Materials and Processes McGraw Hill 1972.
3. WB Mckay Building construction, Vol 1,2, Longman UK 1981.
4. Barry, The Construction of Buildings; Affiliated East West press put Ltd New Delhi 1999.

AR8211	**MODEL MAKING AND ARCHITECTURAL DELINEATION**	**L**	**T**	**P/S**	**C**
		0	**0**	**6**	**3**

OBJECTIVES:

- To introduce students to analytical and illustrative drawing techniques as tools in the materialization and expression of thoughts.
- To introduce model making as a generative process, a tool in Design generation.
- To inculcate the dynamic act of constructing in thinking process.
- To understand the challenges of proper craftsmanship.

UNIT I LINE, RENDER AND MIXED MEDIA 16

Free hand sketching in architectural representation- pen, charcoal, ink, water colour, paints, mixed media, collages, lino cutting, print making as tools.

UNIT II DIAGRAMMING 18

Conceptual sketches - Plan, section, elevation, perspectives, isometric / oblique projections, axonometric /parallel projection, photography and montage as techniques in Architectural delineation from study till presentation.

Unit I & II can be explored by way of assignments that require study, analysis, documentation with weightage given to representational expression and techniques.

UNIT III DESIGN PROCESSES AND MODEL MAKING TECHNIQUES 18

Generative / geometry, fractals, parametrics / material explorations (both in traditional materials like mount, foam, thermacoel, clay, plaster of Paris, paper Mache, wood and new age materials like polystyrene, Aerocon blocks, plastics, meshes, and processes like carpentry, casting, moulding, welding ,laser cutting etc.

Unit III can be explored with exercises that involve research through a process for example nature to structure and the evolution of a structural system that can be fabricated to scale.

UNIT IV PRESENTATION MODELS 18

Exploration in varying scales of models through instruction in techniques- Residential to urban - Historic / Contemporary buildings - Exercises involving topography, textures, landscapes, human elements etc.

UNIT V STUDY MODELS AS A TOOL IN ARCHITECTURAL DESIGN PROCESS 20

Exploration of the physical model as a tool through all phases of architectural design process, ranging from conceptual to specific design solutions- This Unit will integrate with the Architectural Design course in this semester.

TOTAL: 90 PERIODS

OUTCOMES:

- Exploration of conventional and less conventional techniques of representation in an attempt to creative visualization and to understand drawings as vehicles of thinking.
- Versatility in making models ranging from study to presentation and in varying scales and materials.

TEXTBOOKS:

1. Mo Zell – The Architectural Design course, Understand the Principles and Master The Practices, Thames, and Hudson, 2008.
2. Neil Bingham – 100 Year of Architectural Drawings 1900 – 2000, Laurence King, 2013
3. Robert. W Gill – Rendering with Pen + Ink - Thames, and Hudson – 2007.
4. Leon Krier Drawing for Architecture – Michael God well - 2007

REFERENCES:

1. Marco Frascari - Eleven Exercises in the art of Architectural Drawing, Routledge, 2011
2. Natascha Meuser, Construction and manual Architectural Drawings, DOM Publisher, 2012
3. Rendow Yee, Architectural Drawing A visual Compendium of Types and Methods, Wiley, 2013
4. David Dernie, Architectural Drawing, Laurence King, 2010.
5. Lorraine Farrelly, Representational Techniques, AVA, 2011.

AR8212	**ARCHITECTURAL DESIGN I**	**L**	**T**	**P/S**	**C**
		0	**0**	**12**	**6**

OBJECTIVES:

- To enable the conceptualization of form, space and structure through creative thinking and to initiate architectural design process deriving from first principles.
- To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.
- To involve students in a small scale building project(s) which will sensitize them to intelligent planning that is responsive to the environmental context.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts and architectural program.
- To engage in discussion and analytical thinking by the conduct of seminars/ workshops.
- To enable the presentation of concepts through various modes and techniques that will move constantly between 2D representation and 3D modeling.

CONTENT:

Scale and Complexity: projects involving small span, single space, single use spaces with simple movement, predominantly horizontal, as well as simple function public buildings of small scale; passive energy.

Areas of focus/ concern:

- Architectural form and space.
- Aesthetic and psychological experience of form and space in terms of scale, colour, light, texture, etc.
- Function and need: user requirements, anthropometrics, space standards, circulation.
- Image and symbolism.

Typology/ project: bedroom, bathroom, kitchen, shop, exhibition pavilion, children's environment, snack bar, residence, petrol bunk, fire station.

TOTAL: 180 PERIODS

OUTCOMES:

- The students shall understand the basic functional aspect of designing simple building type and its relevant spatial organization.
- The students shall be learn to reciprocate and sensitize the design/concept to the environment and the design skill of the project.

TEXTBOOKS:

1. Joseph De Chiara, Michael J Crosbie, Time Saver Standards for Building Types, McGraw Hill Education; 4th edition, 2014..
2. Joseph De Chiara, Julius Panero, Martin Zelnik, Time Saver Standards for Interior Design and Space Planning, McGraw Hill 2011.
3. Ernst Neuferts Architects Data, Blackwell 2012.
4. Ramsey et al, Architectural Graphic Standards, Wiley 2008.

REFERENCES:

1. Will Jones; Architects Sketch books; Thames & Hudson; 2011.
2. Sam F.Miller, Design Process: A Primer for Architectural and Interior Design, VNR; 1995.