ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

B.ARCH.

REGULATIONS – 2017

CHOICE BASED CREDIT SYSTEM

I & II SEMESTERS CURRICULA AND SYLLABI

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.	MA8101	Mathematics	BS	4	2	2	0	3
THEORY CUM STUDIO								
3.	AR8111	Architectural Drawing I	ES	5	1	0	4	3
4.	HS8111	Communication English	PAEC	4	2	0	2	3
STUDIO								
5.	AR8112	Art Studio	HS	6	0	0	6	3
6.	AR8113	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.	AR8211	Architectural Drawing II	ES	5	1	0	4	3
4.	AR8212	Building Materials and Construction I	PC	5	1	0	4	3
STUDIO								
5.	AR8213	Model Making and Architectural Delineation	PC	6	0	0	6	3
6.	AR8214	Architectural Design I	PC	12	0	0	12	6
			TOTAL	**35**	**7**	**2**	**26**	**21**

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.

AR8211	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

AR8212	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.

AR8213 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.

AR8214	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.