

GALGOTIAS UNIVERSITY

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COURSE BOOK School of Architecture -2020 Volume-I



Curriculum and syllabus
for School of Architecture

1. Bachelor of Architecture2



(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

Program: Bachelor of Architecture

Scheme: 2020-2021

Vision

To be known globally as a premier School of Architecture for design, innovation, creativity, holistic education and trans-disciplinary research.

Mission

M1: Develop competencies in field of Architecture through Project Based Learning teaching process

M2: Establish state-of-the-art facilities for design and simulation

M3: Prepares architectural graduates to actively participate in the contemporary milieu, encourage and anticipate paradigm shifts, and respond to change

M4: Employ an aesthetic approach to develop sustainable ethical solutions for societal concerns

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates will:

PEO 1: Engage in resilient professional entrepreneurship activities to enhance their own stature.

PEO 2: Contribute to the society or Work as acknowledged leader in a team employed in industry/ organisations in context of global built environment.

PEO 3: Pursue higher education and research in architecture and allied specializations.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Architecture Graduates will be able to:

PSO 1 Human psychology and Philosophy: Interpret human behavior and mental processes, including perception, cognition and emotion by understanding real time architecture project

PSO 2 Indian Traditions and Culture: Amalgamate basic concepts of Indian values and ethics with contemporary techniques to form modern social fabric

PROGRAMME OUTCOMES

Architecture Graduates will be able to:

- i. **Architectural knowledge:** Interpreted the knowledge of Design parameters, mathematical analysis, construction technology, architectural fundamentals and latest development in various field for the solution of complex architectural design problems.
- ii. **Problem analysis:** Identify, formulate, review research literature and analysis of complex architectural problems reaching substantiated conclusions using first principles of basic design, users comfort concerns, climate oriented solutions, and architectural services.
- iii. **Design/development of solutions:** Design solutions for complex architectural problems and design system components or processes that meet the specified user and environmental needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental issues.
- iv. **Conduct investigations of complex problems:** Integrate research-based knowledge and research methods including experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- v. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern analytical tools and simulation of complex architectural activities with an understanding of the limitations.
- vi. **The architect and society:** Evaluate contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional architectural practice.
- vii. **Environment and sustainability:** Elaborate the impact of the professional architectural solutions in societal and environmental contexts, demonstrate the knowledge and need for sustainable development.
- viii. **Ethics:** Integrate ethical principles and commitment to professional ethics, responsibilities and norms of the architectural practice.
- ix. **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
- x. **Communication:** Communicate effectively on complex architectural activities with the architectural and allied community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
- xi. **Project management and finance:** Synthesize knowledge and understanding of the architectural and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- xii. **Life-long learning:** Relate to the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of environmental, social, economic, and technological changes.

Curriculum

Year :	First						Semester					I
MODU LE Code	Name of the Module	Teaching Scheme					Cred its	Practical				Tota l Mar ks
		L	T	P	Tota l Hou rs	Total Hours per Week coeffi ent		IA			Practi cal VIVA 4	
								Practi cal VIVA 1	Practi cal VIVA 2	Practi cal VIVA 3		
ARMO100 1	INTRODUCTI ON TO ARCHITECT URE	0	0	50	50	3	2	15	15	20	50	100
ARMO100 2	PRODUCT ANALYSIS	0	0	15 0	150	9.5	6	15	15	20	50	100
ARMO100 3	LANGUAGE OF ARCHITECT URE	0	0	15 0	150	9.5	6	15	15	20	50	100
ARMO100 4	ART AND ARCHITECT URE	0	0	50	50	3	2	15	15	20	50	100
TOTAL					400	25	16					400

Year :	First						Semester					II
MODU LE Code	Name of the Module	Teaching Scheme					Cred its	Practical				Tota l Mar ks
		L	T	P	Tota l Hou rs	Total Hours per Week coeffi ent		IA			Practi cal VIVA 4	
								Practi cal VIVA 1	Practi cal VIVA 2	Practi cal VIVA 3		
ARMO1 005	UNIVERSAL DESIGN	0	0	50	50	3	2	15	15	20	50	100
ARMO1 006	MOMENTS	0	0	15 0	150	8	6	15	15	20	50	100
ARMO1 007	CONTEXT	0	0	15 0	150	8	6	15	15	20	50	100
ARMO1 008	ARBORATU M	0	0	50	50	3	2	15	15	20	50	100
ARMO1 009	SCIOGRAPH Y	0	0	50	50	3	2	15	15	20	50	100

SCHOOL OF ARCHITECTURE

								Practical IA			Practical ETE	
ARTR1001	Architectural Internship-I Winter (2week)	-	-	-	-	-	2	50			50	100
TOTAL					450	25	20					600

Year :	SECOND						Semester					III
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical VIVA 4	
								Practical VIVA 1	Practical VIVA 2	Practical VIVA 3		
ARMO2001	LARGE SPAN	0	0	50	50	3	2	15	15	20	50	100
ARMO2002	SOCIOLOGY	0	0	50	50	3	2	15	15	20	50	100
ARMO2003	PAVILION	0	0	150	150	8	6	15	15	20	50	100
ARMO2004	REINFORCED CEMENT CONCRETE	0	0	150	150	8	6	15	15	20	50	100
ARMO2005	RENDER	0	0	50	50	3	2	15	15	20	50	100
								Practical IA			Practical ETE	
ARTR2001	Architectural Internship-2 (3week)	-	-	-	-	-	3	50			50	100
TOTAL					450	25	21					600

Year :	SECOND						Semester					IV
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical VIVA 4	
								Practical VIVA 1	Practical VIVA 2	Practical VIVA 3		
ARMO2006	VERNACULAR	0	0	50	50	3	2	15	15	20	50	100
ARMO2007	M17 - STEEL	0	0	50	50	3	2	15	15	20	50	100

SCHOOL OF ARCHITECTURE

ARMO2008	DECODING PATTERN	0	0	150	150	8	6	15	15	20	50	100
ARMO2009	CLIMATE RESPONSIVE ARCHITECTURE	0	0	150	150	8	6	15	15	20	50	100
ARMO2010	FACADE	0	0	50	50	3	2	15	15	20	50	100
								Practical IA			Practical ETE	
ARTR2002	Architectural Internship-3 (2week)	-	-	-	-	-	2	50			50	100
TOTAL					450	25	20					600

Year :	THIRD						Semester					V
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical VIVA 4	
								Practical VIVA 1	Practical VIVA 2	Practical VIVA 3		
ARMO3001	COGENT	0	0	50	50	3	2	15	15	20	50	100
ARMO3002	COGENT2	0	0	50	50	3	2	15	15	20	50	100
ARMO3003	DIONYSIA	0	0	150	150	8	6	15	15	20	50	100
ARMO3004	DECOR	0	0	150	150	8	6	15	15	20	50	100
ARMO3005	BIM	0	0	50	50	3	2	15	15	20	50	100
								Practical IA			Practical ETE	
ARTR3001	Architectural Internship-4 (3week)	-	-	-	-	-	3	50			50	100
TOTAL					450	25	21					600

Year :	THIRD						Semester					VI
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical VIVA 4	
								Practical VIVA 1	Practical VIVA 2	Practical VIVA 3		

SCHOOL OF ARCHITECTURE

ARMO3006	PREFAB	0	0	50	50	3	2	15	15	20	50	100
ARMO3007	TALL BUILDING	0	0	50	50	3	2	15	15	20	50	100
ARMO3008	NEIGHBORHOOD	0	0	150	150	8	6	15	15	20	50	100
ARMO3009	AGORA	0	0	150	150	8	6	15	15	20	50	100
ARMO3010	MANAGEMENT	0	0	50	50	3	2	15	15	20	50	100
								Practical IA			Practical ETE	
ARTR3002	Architectural Internship-5 (2week)	-	-	-	-	-	2	50			50	100
TOTAL					450	25	20					600

Year :	FOURTH						Semester					VII
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical VIVA 4	
								Practical VIVA 1	Practical VIVA 2	Practical VIVA 3		
ARMO4001	RESURGENCE	0	0	50	50	3	2	15	15	20	50	100
ARMO4002	OCULAR	0	0	50	50	3	2	15	15	20	50	100
ARMO4003	HOSPITALITY	0	0	150	150	8	6	15	15	20	50	100
ARMO4004	HEALTH CARE	0	0	150	150	8	6	15	15	20	50	100
ARMO4005	PERCEPTION	0	0	50	50	3	2	15	15	20	50	100
TOTAL					450	25	18					500

Year :	FOURTH						Semester					VIII
MODULE Code	Name of the Module	Teaching Scheme					Credits	Practical				Total Marks
		L	T	P	Total Hours	Total Hours per Week coefficient		IA			Practical ETE	
								Practical IA				

SCHOOL OF ARCHITECTURE

ARMO4006	Professional training (22week)	-	-	-	-	-	22	50			50	100
TOTAL					0	0	22					100

Year :	FIFTH						Semester					IX
MODU LE Code	Name of the Module	Teaching Scheme					Cred its	Practical				Tota l Mar ks
		L	T	P	Tota l Hou rs	Total Hours per Week coeffi ent		IA			Practi cal VIVA 4	
								Practi cal VIVA 1	Practi cal VIVA 2	Practi cal VIVA 3		
ARMO5001	AMENABLE	0	0	50	50	3	2	15	15	20	50	100
ARMO5002	smart cities	0	0	50	50	3	2	15	15	20	50	100
ARMO5003	Urban Design	0	0	150	150	8	6	15	15	20	50	100
ARMO5004	Mixed use development	0	0	150	150	8	6	15	15	20	50	100
ARMO5005	SPRAWL	0	0	50	50	3	2	15	15	20	50	100
TOTAL					450	25	18					500

Year :	FIFTH						Semester					X
MODU LE Code	Name of the Module	Teaching Scheme					Cred its	Practical				Tota l Mar ks
		L	T	P	Tota l Hou rs	Total Hours per Week coeffi ent		IA			Practi cal VIVA 4	
								Practi cal VIVA 1	Practi cal VIVA 2	Practi cal VIVA 3		
ARMO5006	ARCHITECTURAL THESIS	0	0	600	650	25	26	15	15	20	50	100
TOTAL					650	25	26					100

List of Electives

Elective-1 (OCULAR)

Sl No	Module Code	Name of the Electives					Assessment Pattern
			L	T	P	C	
1	ARMO4002	Product Design*1			50	2	As per module
2	ARMO4002	Art Appreciation*1			50	2	
3	ARMO4002	Interior Design*1			50	2	
4	ARMO4002	Photography*1			50	2	
5	ARMO4002	Architectural Façade*1			50	2	
6	ARMO4002	Visual Communication*1			50	2	

Elective-2 (PERCEPTION)

Sl No	Course Code	Name of the Elective					Assessment Pattern
			L	T	P	C	
1	ARMO4005	Low Cost Architecture*2			50	2	As per module
2	ARMO4005	Architectural Journalism*2			50	2	
3	ARMO4005	Architectural Conservation*2			50	2	
4	ARMO4005	Achitectural Pedagogy *2			50	2	
5	ARMO4005	Futuristic Architecture *2			50	2	

Elective-3 (AMENABLE)

Sl No	Course Code	Name of the Elective					Assessment Pattern
			L	T	P	C	
1	ARMO5001	Disaster Mitigation & Management*3			50	2	As per module
2	ARMO5001	Sustainable Cities & Energy Compliance*3			50	2	
3	ARMO5001	Environmental Impact Assessment *3			50	2	
4	ARMO5001	Earthquake Resistant Structure *3			50	2	
5	ARMO5001	Intelligent Buildings *3			50	2	
6	ARMO5001	Energy Concious Architecture *3			50	2	

Elective-4 (SPRAWL)

		Name of the Elective			Assessment Pattern
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Sl No	Course Code		L	T	P	C	As per module
1	ARMO5002	Tranport Planning*4			50	2	
2	ARMO5002	Urban & Regional Planning*4			50	2	

Detailed Syllabus

Name of The Course	M1: INTRODUCTION TO ARCHITECTURE			
Course Code	ARMO 1001			
Prerequisite	Sketching techniques, Importance of Architecture			
Co-requisite	Human settlement			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Unlearn the traditional classroom system and get acquainted to Project Based Learning
2. Learning graphical representation of everyday experience
3. Understanding professional ethics and values

Course Outcomes

CO1	Create an piece of art
CO2	Appraise architecture profession
CO3	Correlate various courses in architecture pedagogy
CO4	Demonstrate hand eye Coordination through sketches
CO5	Value role of human settlement in history

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1001: Introduction to Architecture 15 Hours
Introduction to Architecture Profession, Roles, Responsibilities and Liabilities of an Architect and other professionals in the building and construction field. Architects Act-CoA, I.I.A, NASA.A brief summary of Architecture; its various definitions, associated aspects/dimensions, approaches through different ages and factors affecting architecture of a region. Relationship between basic design and

architectural design, understanding of space, form, order and design.

BARC 1001: Building Construction

10 Hours

Introduction to commonly used building terminology, tools, materials and elements of a building from foundation to roof (Stepped footing & strip foundations, Plinth, DPC, Flooring, Walls, Door, Window, Sill, Lintel, Column, Beam, Slab, Parapet, Terracing.

BARC 1001: Building Structures-I
8 Hours

Introduction of structural systems: Behavior of structural components, How we choose materials. How different materials behaves. How the shape, stability, durability of a structure has role on structure and how the factors varies as per the structural design.

Introduction of Vectors, Resultant and vectors, Components of vectors
Moment of Inertia, Centre of gravity. Types of loads, Moment, Torsion, Shear.

BARC1004 History of Architecture-I
7 Hours

Introduction to History of Architecture
Role of history in Architecture, Evolution of human habitat in History

Prehistoric Age

Introducing concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization with examples from Carnac and Stonehenge.

In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.

BARC1006 Architectural Graphics-I
4 Hours

Introduction to Art and graphics, its role and significance, basic Sketching techniques and line drawing, charcoal studies. Expression of Ideas and Concepts through visual communication. Using tools for graphics and architecture- setting up of parallel bar and drafting table.

Introduction to technical drawing, drawing equipment, Drafting and quality of lines with pencil, Basic Geometry- Construction of planes, curves, circles tangent and regular polygons, Free hand and mechanical lettering- Free hand drawing and lettering for titles, line work with the use of Drawing Instruments.	
BARC1007 Communication	6
Hours	
Orientation to course and program, the system of education, assigning faculty mentors, assessing individual qualities, identification of fears, strength and weakness Inculcating human values and professional ethics, behavior towards faculty, staff and peers. Introduction teaching pedagogy- Syllabus, curriculum, Project Based Learning (PBL) and Outcome Based Education (OBE). Story writing to capture themes and images.	

Suggested Reading

- 1) Ching, Francis D. K. “Architecture: Form, Space and Order”, John Wiley and Sons Inc.
- 2) Lidwell, William, Holden, Kestina, Butler, Jill, “Universal Principles of Design”, Rockport – Publications, Massachussets
- 3) “The History of Architecture” by Sir Bannister Fletcher
- 4) Building Construction & Materials, S.C. Rangwala
- 5) Robert W. Gill, Rendering with Pen and Ink, Thames & Hudson; 1984

Name of The Course	M2:Product Analysis			
Course Code	ARMO 1002			
Prerequisite	Use of drawing instrument			
Co-requisite	Design by using elements, Sketching skills and techniques			
Anti-requisite				
	L	T	P	C
			150	6

COURSE OBJECTIVES

1. Linework, lettering, Autocad, google sketchup,

2. Composition in 2D and 3D
3. Introduction to technical drawing and print.

Course Outcomes

CO1	Appraise different types of structural forces
CO2	Appraise the correlation between human measurements and surrounding
CO3	Develop basic comm. Skills and sense of composition and design
CO4	Create object with Movement function
CO5	Apply Elements of Design

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1001 Architectural Design-I	75
Hours	
Unit-I: Elements of Design	
Introduction to elements of Design like point, line, shape, form, texture, color; their definitions and expression quality. Application of elements in architectural design through the use of line, plane, solid and voids and application of texture, color, etc. Exercises like logo, cover page, greeting card, mural design etc. to be considered. Application of design elements in 2D and 3D compositions. Exercises of 3D compositions to be introduced Model making workshop –Basic 3-D geometric forms	
Unit-II: Design Aspects- Ergonomics	
Basic Ergonomics and anthropometrics, human body measurements, human functions and their implications for product and space requirements	
Unit-III: Product Analysis	
Functional product analysis, user body dimensions, ease of use, comfort, material and aesthetics. Analysis of mechanical objects with movements – folding chair, tape dispenser, spectacles, compass, player, stapler, Pencil Sharpener with rotating handle, lock, wooden toys for kid, fountain pen, spray bottle etc. Redesigning product based on the findings	

BARC 1002 Building Construction-I 20 Hours
Understanding role of building elements Understanding construction built form & building practice Paradigms: load bearing structures, frame structures Study of Simple buildings from foundation to roof Building construction drawing practices and conventions Building details models
BARC1003 Building Structure-I 20 Hours
How the structural behavior of different materials vary as per Ductility, Brittleness, Malleability Toughness, Hardness. Load-displacement behavior of a structure. How ductile and brittle materials behaves in Tension, Compression, Shear. Stress-strain relationship of materials, Young's modulus, Shear Modulus, Bulk modulus, Poisson's ratio, Hooke's law. Stress, Strain Curves for different materials in compressive and tensile loading. Nominal and True Curve. How the stress strain behavior varies for different materials. Limit of proportionality, Elastic limit, Elastic and Plastic behavior of material. Yielding of material. Ultimate stress, fracture
BARC1006 Architectural Graphics-I 28 Hours
Freehand Drawing Drawing trees, Humans and furniture, 2D compositions using elements of Design, composition in color media. Indoor and outdoor sketching in pencil, crayon, colours, charcoal and ink. Color Fundamentals Perception of color and light, related definitions like hue, value, intensity, color wheel, color theory, color schemes, effect of color in architecture, color symbolism. Basic technical Drawing and Lettering Introduction to basics- introduction to subject and drawing equipment, Drafting and quality of lines with pencil, Basic Geometry- Construction of planes, curves, circles tangent and regular polygons, Free hand and mechanical lettering-

Free hand drawing and lettering for titles, line work with the use of Drawing Instruments. Scale and Dimensioning Types and uses of scales: Plain, diagonal, comparative, and scale of chords, Scales used in architecture, Reducing and enlarging scales, Representative fraction, Dimensioning of lines and plane figures, Measuring and drawing to scale the following: furniture items, rooms, doors and windows, etc.
BARC1007 Communication 7 Hours
Communication: Need for effective communication, process of communication, The Seven Cs of Effective Communication - Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness; Barriers to communication - miscommunication, physical noise; Overcoming measures Essentials of Grammar: Sentence structure; Sentence formation, Use of appropriate diction, Tenses, articles and prepositions; English Phonetics: International phonetic alphabets - Production of sounds, Classification of consonant and vowel sounds.

Suggested Reading

- 1) I.H. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004..
- 2) Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964..
- 3) N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India.
- 4) Punmia P. C., "Strength of Materials & Mechanics of Structures"
- 5) Khurmi R. S., "Strength of Materials"

Name of The Course	M 3: Language of Architecture
Course Code	ARMO 1003
Prerequisite	Design elements, Building terminology

Co-requisite	Architectural terminology, Presentation Techniques			
Anti-requisite				
	L	T	P	C
			150	6

COURSE OBJECTIVES

1. Developing concepts
2. Understandings- sense of space
3. Meaning of walls (Enclosure)
4. Establishing boundaries
5. Introduction to natural materials

Course Outcomes

CO1	Apply basic architectural terminologies in speech and writing
CO2	Appraise painting on the principles of design
CO3	Appraise building form on the basis of solids, voids, shades and shadows
CO4	Create forms using clay and pottery
CO5	Participate in debates and group discussion

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC 1001: Architectural Design-I 45 Hours
. Principles of Design and its role in expression (architectural expression) Introduction to principles of organization/composition Repetition, Variety, Radiation, Rhythm, Gradation, Emphasis & Subordination, Proportion, Harmony, , Balance.
Exercises like logo, cover page, greeting card, mural design etc. to be considered. Application of design elements in 2D and 3D compositions. Exercises of 3D compositions to be introduced

Model making workshop –Basic 3-D geometric forms

BARC1002: Building Construction-V 20 Hours

Unit 1 Construction Process and Components:
 1. Introduction to various components of a load-bearing structure
 2. Sub-structure: Introduction to various methods, materials, tools and equipment used in Excavation; Foundation and Plinth.
 3. Superstructure: Walls; Floors; Roofs (flat, sloping and vaults); Openings in walls- lintels (flat, corbelled, arched); sills; staircase; sun-shading devices.
 To be explained through Section of a building sheet work and site visit to a live site.

Unit 2 Building Materials:
 Mud, Earth, fly ash, burnt brick- Manufacture, Classification, preparation and usage- Sectional Model of Hut using Mud as primary material

BARC 1003: Building Structures-V 18 Hours

Creep, Fatigue, Stress Relaxation. Post elastic strain.
 Understanding the applications of Different types of loading conditions and load combinations.
 Introduction of beam element. Behavior of internal hinge.
 Classifications of beams according to their loadings and support condition.
 Application of loads on Beam. Support reactions. Static equilibrium conditions, Determinate and Indeterminate structures.
 Concepts and working principles of Different types of supports. How hinge supports, roller, fixed support works.

BARC1006 Architectural Graphics-I 26 Hours

Measuring and drawing to scale the following: furniture items, rooms, doors and windows, etc.

FreeHand Drawing
 Basic rendering and drawing techniques to depict textures: Scribbling, stippling, shading, hatching, doodling. Rendering 3D objects, still life sketching

<p>Orthographic Projections Introduction to orthographic projections - Planes of Projections, First angle projections, Drawing of lines, basic geometrical shapes in different positions, Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions, construction of plan, elevation and section of 3D objects and projections in various positions. Surface Development Surface development of solids and sectional solids- Study of development of surfaces, drawing of unfolded surfaces of right solids like Cubes, Prisms, Cylinders; drawing the development of the lateral surface of a pyramid & Cone.</p>
<p>BARC1004 History of Architecture-I 19 Hours</p>
<p>Ancient River Valley Civilizations Nile, Indus, Tigris and Euphrates Rivers (Mesopotamia), yellow River(Chinese)</p>
<p>BARC1005 Computer Application in Architecture-I 12 Hours</p>
<p>MS Office - MS Word Create a document that can be used by previous versions of word, Saving Options. Create a document - Open a new document and start typing, Start a document from a template, Delete a document, Add a heading, Adjust the spaces between lines or Paragraphs, Insert a page break, Insert a picture or clip art, Insert or create a table, Headers, Footers, and Page numbers, Create a table of contents, Apply themes to Word documents, Add a cover page. Read documents in Word - Read a document, Mark up a document, Find or look up words and phrases, Turn on or off - full screen reading view.</p> <p>MS Office – MS Excel - Getting Started with Excel - Create a workbook, Enter data in a worksheet, Format a worksheet, Format numbers in a worksheet, Print a worksheet, Create an Excel table, Filter data by using an auto filter, Sort data by using an auto filter, Apply conditional formatting, Apply data validation, Create a formula, Use a function in a formula, Chart your</p>

<p>data, Create a macro, Create a pivot table report, Activate and use an add-in Keyboard shortcuts in Excel 2010 - Keyboard access to the ribbon, CTRL combination shortcut keys, Function keys, Other useful shortcut keys.</p> <p>MS Office – MS Power point - Create a basic Power Point presentation - Name and create a new presentation, Open a presentation, Save a presentation, Insert a new slide, Add, Rearrange and delete slides, Add text to a slide, Apply a template to your presentation, Apply a theme to add color and style to your presentation, Insert a picture or clip art and insert content or insert a screenshot, Add, Change, or Delete shapes, Create a smart art graphic, Add slide numbers, Page numbers, Date and time, Create a hyperlink, Deliver and distribute your presentation, View a slide show and View your speaker notes privately, while delivering a presentation on multiple monitors, Print out a presentation, Tips for creating an effective presentation</p>
<p>BARC1007 Communication 12 Hours</p>
<p>English Grammar Simple Grammar – using appropriate words, filling of blanks, completing of sentences, active and passive voice, correcting mistakes in texts. Use of proverbs, metaphors and punctuation. Comprehension Reading and listening comprehension, to develop the ability to read and listen with understanding and draw reasoned conclusions. Art of notes taking from spoken and written English. Comprehension of lectures and speeches to locate key points.</p> <p>Writing Skills: Letter writing - Formal, informal and demi-official letters; Business letters - quotations, supply orders, complaints, sales, adjustment letters, etc.; Resume writing: Difference between bio-data, CV and resume, Cover letter, Application for job.</p> <p>Soft skills: Classification of soft skills, soft skills for personality development & career growth; Capturing audience, Tone, Behavior and telephone etiquette - Good practice when making</p>

and receiving a call; Becoming a good leader and team-player, Personal SWOT analysis.

Suggested Reading

- 1) I.H. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004..
- 2) Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964..
- 3) N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India.
- 4) Punmia P. C., “Strength of Materials & Mechanics of Structures”
- 5) Khurmi R. S., “Strength of Materials

Name of The Course	M 4: Art and Architecture			
Course Code	ARMO 1004			
Prerequisite	Knowledge of measurement and scale, Basic 2d			
Co-requisite	2D software, Exposure of building typology			
Anti-requisite				
	L	T	P	C
			50	2

COURSE OBJECTIVES

1. Scale, Properties w.r.t Human Dimensions(Users),Adult/Child(Gender)
2. Understanding of ergonomics – to design furniture
3. Structures till equilibrium, loads
4. Presentation using (CAD, Sketchup, Photoshop)
5. Sketching perspective and isometric

Course Outcomes

CO1	Apply 2D orthographic projections
CO2	Create a 2D composition in color medium

CO3	Create a 3D composition using Google Sketch up.
CO4	Demonstrate better hand eye Coordination through line drawings using manual drafting
CO5	Follow Gestalt theory of visual perception

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1001: Architectural Design-1 15 Hours
Unit-I: Design Aspects- Ergonomics Understanding the human body in space Activities and their relationship with spaces Scales and proportions Developing a language vocabulary, visualization Exposure to architecture, Exposure to architects and their works Buildings, practices, site visits, meeting architects Additive, Dimensional, Subtractive - exercises primarily through 3-D models of simple geometrics
BARC1003 Building Structures-I
Cantilever beams, Deflection in Cantilever beams. Concentrated loads. Analysis of support reactions for simply supported beams under concentrated loading. Distributed loads. Analysis of support reactions for simply supported beams subjected to uniformly distributed loading. . Solving problems for determining the support reaction values for beams subjected to combination of loading conditions.
BARC1006 Architectural Graphics-I
Orthographic Projections Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions, construction of plan, elevation and section of 3D objects and projections in various positions.
BARC1005 Computer Application in Architecture-I

AutoCAD 2D 2017 – How to Open new file, sheet sets, Drawing tools
 Sketch up 2016 – Tutorial on drawing 3d objects using sketchup
 Adobe in Design, Presentation methods, preparing raw drawings for laser cutting machines

Suggested Reading

1. “Design through Discovery”, M.E. Bevlin, Holt, Rinehart, and Winston.
2. “Drawing and Perceiving”, Douglas Cooper, John Wiley & Sons.
3. “Principles of Design in Architecture”, K.W. Smithies, Van Nostrand Reinhold.
4. “Architectural Drawing Masterclass”, Tom Porter, Charles Scribner's.
5. “Time-saver Standards for Architectural Design Data: The Reference of “Architectural Fundamentals”, Donald Watson, McGraw-Hill.
6. “Time Saver Standards for Building Types”, John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York.
7. “Architectural Graphic Standards”, Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons.
8. “Form Space & Order”, 4 th Ed., Francis DK Ching, John Wiley & Sons, New Jerse
9. “Design in Architecture”, Geoffrey Broadbent John Wiley and Sons, 1973.

Name of The Course	M6: Universal Design			
Course Code	ARMO 1006			
Prerequisite	Anthropometric, Human scale			
Co-requisite	Measuring drawing, Types of building material			
Anti-requisite				
	T	T	P	C
			50	2

Course Objectives

- 1) Early River Civilizations

- 2) Anthropometry-mono cellular- kitchen, living room, bathroom
- 3) Services- water supply

Course Outcomes

CO1	Analyze architecture of early river civilizations
CO2	Organize furniture layout for mono-cellular units such as kitchen, toilet, bedroom, living room
CO3	Analyze human activities on the basis of space requirement
CO4	Apply basic concepts of water supply for mono-cellular unit
CO5	Apply basic concepts of surveying and levelling in design of mono cellular units

Continuous Assessment Pattern

Practical IA			Practical	Total Marks
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	
15	15	20	50	100

Course Content:

BARC1009 Architectural Design-II 30 Hours
Unit-I: Architectural Design Aspects Basic anthropometrics, human functions and their implications for space requirements. Minimum and optimum areas for mono functions. User’s data, Movement and circulation diagrams. Spatial interpretations – various activities and their relationship with spaces.
Unit-II: Floor Space Layout Functional furniture layout, circulation, lighting and ventilation for spaces such as living/dining, kitchen, bedrooms, Architect’s office, Doctor’s clinic, Food parlor etc. Analysis of human activities on the basis of space requirement on 1:1 scale, chalk, new
Unit-III: Preliminary Architectural Design Design of mono-cellular-unit/structure on a level plane, designing of simple activity spaces, designing of multiple but simple activity spaces involving primarily horizontal circulation

<p>Note: The requirements pertaining to the handicapped and elderly people are to be addressed in design and detailing.</p>	
<p>BARC1012 History of Architecture-II 10 Hours</p>	
<p>Unit-I: Ancient River Valley Civilization: Egypt</p> <p>Landscape and culture of Ancient Egypt, History, Religious and funerary beliefs and practices, Monumentality tomb architecture: Evolution of the Pyramid from Mastaba, Great Pyramid of Cheops, and Gizeh etc.</p> <p>Unit-II: Ancient River Valley Civilization: Egypt</p> <p>Temple Architecture: Mortuary temples and cult temples, Temples of Ammon Ra, Karnak, Khons , Temple of Abu Simbel (Rock cut) etc.</p> <p>Unit-III: Ancient River Valley Civilization: Mesopotamia</p> <p>Urbanization in the Fertile Crescent: Sumerian, Babylonian, Assyrian and Persian culture, Evolution of city-states and their character, law and writing, Theocracy and architecture: Nineveh , Khorshabad, Marie, Babylon etc.</p> <p>Unit-IV: Ancient River Valley Civilization: Mesopotamia</p> <p>Evolution of Ziggurat: Ziggurat of Ur, Urnamu etc. Evolution of the Palaces: Palace of Sargon, Khorsabad, palace of Persepolis</p>	
<p>BARC1017 Building Services-I 3 Hours</p>	
<p>Unit-I: Water Supply Requirements Introduction to Water Supply; Water Requirement for different building types; storage, Storage and Distribution of Water - Different methods of water distribution boosting water, gravity and pressure distribution by storage tanks of individual buildings. Potable Water Standards, Domestic water demand, capacity of overhead tanks and calculation of water consumption.</p> <p>Unit-II: Water Distribution Systems</p>	

<p>Water distribution networks. Cold and hot water distribution within the building. Specifications and sketches of various plumbing fittings for buildings. Uses of valves, taps, and their different types. Layout of water supply lines in a domestic building.</p>
<p>BARC 1015 Surveying and Levelling 7 Hours</p>
<p>Unit-I: Introduction of Surveying</p> <p>Introduction of Surveying. Plans, maps. Horizontal and Vertical measurements. Type of instruments for linear and angular measurements. Chain surveying, Compass surveying, Theodolite, Tacheometry, Plane table surveying, Total stations, Dumpy level. Triangulation and traversing. Practical applications of surveying. Leveling, methods for leveling, reciprocal leveling, Rise and fall method, Height of the instrument method. Contour lines. Contour maps and necessity and guidelines for drawing contour maps</p>

Suggested Reading

1. “Design through Discovery”, M.E. Bevin, Holt, Rinehart, and Winston.
2. “Drawing and Perceiving”, Douglas Cooper, John Wiley & Sons.
3. “Principles of Design in Architecture”, K.W. Smithies, Van Nostrand Reinhold.
4. “Architectural Drawing Masterclass”, Tom Porter, Charles Scribner’s.
5. “Time-saver Standards for Architectural Design Data: The Reference of “Architectural Fundamentals”, Donald Watson, McGraw-Hill.
6. “Time Saver Standards for Building Types”, John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York.
7. “Architectural Graphic Standards”, Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons.
8. “Form Space & Order”, 4 th Ed., Francis DK Ching, John Wiley & Sons, New Jerse
9. “Design in Architecture”,Geoffrey Broadbent John Wiley and Sons, 1973.

Name of The Course	M7: Moment			
Course Code	ARMO 1007			
Prerequisite	Construction material and equipment			
Co-requisite	Basic knowledge of truss structure			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Natural Form, Kinetic Sculpture based on structures
2. Models and MCQs on History of Architecture

Course Outcomes

CO1	Categorize cement and its use in RCC Structures
CO2	Make models/sketches based on Roman History
CO3	Make models/sketches based on Greek History
CO4	Analyze a room using Structural kinetics
CO5	Visualize Load transfer and distribution in surrounding structures

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1010 Building Construction-II 22 Hours
<p>Unit I: Brick and Clay Products BRICKS: Manufacturing, Composition, Sizes, Properties and Classification of bricks, Tests for bricks. Introduction of Brickworks: masonry bonding & ornamental bonding, which will focus on: (types of Brick bonds: English, Flemish & Stretcher bond for both 230 mm & 115 mm brick wall, detail brick layout at corners, junctions and brick columns. Applicable IS Codes for Bricks. Load Bearing Structures using Modular units- Stabilized Earth, Brick, and Stone etc.</p>

BARC1012 History of Architecture-II 15 Hours
<p>Unit-I: Greek Architecture</p> <p>Classical orders and constituent elements of architecture - Column orders and the articulation of temples. Classification of temples, Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site. Study of importance- Acropolis, Agora, Temples, Theatres, Tombs and House forms.</p> <p>Unit-II: Roman Architecture</p> <p>Introduction to building types to correspond the complex social functions and structure. Concrete and construction of vaults and domes. Uses of classical orders in surface articulation. Study of important forums, Temples, Basilicas, Theatres, Amphitheatres, Circuses, Tombs, Triumphal arches, palaces, houses and villas</p>
BARC1011 Building Structures-II 8 Hours
<p>Unit-I: Introduction to cement concrete</p> <p>Introduction of Reinforced Cement Concrete. Role of Mix Design in Structural Analysis. Types of Cement and their uses. How we choose types of cement in RCC and PCC construction. Tests for Cement and concrete. Aggregate tests and size considerations Workability of a mixture,</p>
BARC1013 Computer Application in Architecture-II 8 Hours
<p>Google Sketch Up+ V-ray</p> <p>Google Sketch up 3D, Drawing & Measurement Tools, creation of geometrical shapes & forms, union and intersection of forms. Application of color& materials. Introduction to editing tools, modifying existing shapes and forms, 3D drawings with site and surroundings, Sciography & rendering in 3D drawings. Concept of camera and walkthrough.</p>

Suggested Reading

SCHOOL OF ARCHITECTURE

1. "Design through Discovery", M.E. Bevin, Holt, Rinehart, and Winston.
2. "Drawing and Perceiving", Douglas Cooper, John Wiley & Sons.
3. "Principles of Design in Architecture", K.W. Smithies, Van Nostrand Reinhold.
4. "Architectural Drawing Masterclass", Tom Porter, Charles Scribner's.
5. "Time-saver Standards for Architectural Design Data: The Reference of "Architectural Fundamentals", Donald Watson, McGraw-Hill.
6. "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York.
7. "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons.
8. "Form Space & Order", 4 th Ed., Francis DK Ching, John Wiley & Sons, New Jerse
9. "Design in Architecture", Geoffrey Broadbent John Wiley and Sons, 1973.
10. Punmia, B. C. (1993) Building Construction, Delhi.
11. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi
12. Relevant IS codes
13. Barry, R (1986) Construction of Buildings, London, vol. 1

Name of The Course	M8: Context			
Course Code	ARMO 1008			
Prerequisite	Circulation and Spaces, Anthropometric			
Co-requisite	Climate , Surveying, Construction techniques of brick			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

- 1) Understanding context w.r.t historic site.

- 2) Graphical representation of landscape and built form/space

Course Outcomes

CO1	Design a house with brick
CO2	Produce a measure drawings of a given building
CO3	Adapt their design to climatic considerations
CO4	Use surveying techniques and equipment to measure a building
CO5	Organize and plan a study trip

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1009 Architectural Design-I	45 Hours
Unit-I: Residence Design	
Design of a G+1 residence in Brick. Focus will be on the construction details, site and context and their relationship to the built environment. Introduction to element of site-planning and landscaping. Design of a group of buildings set in the context of the study with a focus on site and context. The design of the environment outside the building.	
Unit-II: Study Tour: 3-4 days study tour to a different climate zones to perform measured drawing/exhibition/photography/ documentation report	
BARC1010 Building Construction-II	23 Hours
Unit-I Construction Details for Brick Residence Construction Details for Brick Residence (Excluding doors and windows) - Foundation, Plinth, Walls, columns, Beam, Slab, Projections, Flooring, cavity wall, corbel, cornice, sill, lintel, parapet, drip course etc.	
Unit-II Arches:	

<p>Classification of Arches on the basis of geometrical shape, materials, construction techniques, viz. flat, segmental, semicircular, Tudor, circular, elliptical, semi-elliptical, Venetian, Florentine arches, etc. Illustration of terminology for arches, construction detailing and methods of centering.</p>		
<p>BARC1015 Surveying & Leveling 18 Hours</p>		
<p>Unit-I: Plane Surveying and Theodolite</p> <p>Introduction to plane surveying, conventional tape measurement, electronic distance measurement – Meridians, Azimuths and bearings – Theodolites – Temporary and permanent adjustment – Horizontal and Vertical angle measurements – Electronic total station.</p> <p>Unit-II: Leveling and Contouring</p> <p>Differential leveling, Longitudinal & cross section leveling, Refraction & curvature correction, Reciprocal leveling -Tachometry – Stadia tachometry, tangential tachometry & substance tachometry- Contouring.</p> <p>Unit-III: Calculation of Earthwork and GPS</p> <p>Area, volume calculation of earth work – Introduction to Global positioning system – GPS surveying methods.</p> <p>Unit-IV: Curve Surveying</p> <p>Definitions, designation of curve, elements of simple curve - Settings of simple circular curve, Compound and reverse curve- Transition curve – Introduction to vertical curves.</p> <p>Unit-V: Geodetic surveying</p> <p>Introduction to geodetic surveying, Triangulation surveying – Base line measurement & correction, Satellite station. Surveying adjustments – Principle of least square and adjustment of triangulation network.</p>		
BARC1017	Building	Services-I
10 Hours		

<p>Unit-I: Drainage Systems</p> <p>Basic principles of disposal of waste water from buildings. Systems of drainage – separate, combined and partially separate system, advantages and disadvantages of each system. Concept, design and detailing of rainwater harvesting systems. Study of sanitary fittings, washbasins, WC’s, bathtubs, sink, urinals, bidets, flushing cistern, traps etc. Proper location and ventilation of traps, intercepting chambers and inspection chambers.</p> <p>Unit-II: Sanitation- Sewerage</p> <p>Introduction, importance and purpose of sanitation, terminology and definitions; bacteria, invert, sewer, sewerage, refuse, collection and disposal of refuse. Man holes – drop manholes, manhole with intercepting trap, inspection chambers, self-cleansing velocity, drains on sloping sites, sub soil drainage, storm water disposal – catch basins, inlets, storm water regulators. Septic Tanks; Capacity calculations and Details of a Septic Tank, soak pit, soak well, design aspects, disposal of effluent. Systems of plumbing – single stack, one pipe, and one pipe partially ventilated, two pipe disposal of waste water from buildings.</p>	
BARC1011 Building Structures-II	9 Hours
<p>Factors affecting Workability. IS Code: 456, Code norms and uses of tables as per load carrying capacity of structural elements. Factor of safety in structural design. Distribution of load. Shear failure of Structures. How the dimension of elements varies with the load carrying capacity and material properties. RCC junctions.</p> <p>Factors affecting Workability. IS Code: 456, Code norms and uses of tables as per load carrying capacity of structural elements. Factor of safety in structural design. Distribution of load. Shear failure of Structures. How the dimension of elements varies with the load carrying capacity and material properties. RCC junctions.</p>	
BARC 1014 Architectural Graphics-II	

<p>BARC 1014 Architectural Graphics-II</p> <p>Unit-I Manual techniques for painting/colouring of Architectural Drawings Sketch using freehand techniques, Draw views demonstrating the play of light and shadows. Demonstrate use of various presentation mediums Techniques Colouring of architectural presentation drawings in various medium, Monochromatic shades, Shades and shadows in multi-colored drawings</p>	
<p>BARC1016 Climatology-I</p>	<p>25</p>
<p>Unit-I Introduction to Climatology</p> <p>Introduction to climatology, Relation to Architecture, Macro and Micro Climate, Climatic Zones. Climatic data- parameters- relevance to design of built environment. Describing climate-climate summary chart, solar geometry- sun path diagram, heating and cooling periods. Psychometric charts.</p> <p>Unit-II Thermal Comfort</p> <p>Thermal Comfort : Factors and Balance, Body's Mechanism of Heat Production and Loss, Methods of Heat Transfer, Comfort Scale, Effective Temperature, operative temperature, CET, Adaptive comfort.</p> <p>Unit-III Heat transfer in Buildings:</p> <p>Heat transfer in Buildings : Sol Air Temperature, Solar Gain Factor, Thermal Quantities: Temperature, Heat, Heat Flow Rate Specific Heat, Conductance, Resistance, Surface Conductance, U value, Periodic Heat Flow, Time Lag & decrement factor, Effect of Different Materials, Effect of Multilayered Bodies - Insulation/Cavity (ECOTECT software may be used). Ventilation: Principles of Ventilation in Buildings.</p>	

Suggested Reading

1. BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.
2. Foster, Stroud (1963) Mitchell's Advanced Building Construction, Allied Publishers Private Limited, Bombay.

3. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
4. Punmia, B. C. (1993) Building Construction, Delhi.
5. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi
6. Relevant IS codes
7. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
8. "Time-saver Standards for Architectural Design Data: The Reference of "Architectural Fundamentals", Donald Watson, McGraw-Hill.
9. "Architectural Graphic Standards", Charles George Ramsey, Harold Reeve Sleeper, Bruce Bassler John Wiley & Sons.

Name of The Course	M 9: Arboretum			
Course Code	ARMO 1009			
Prerequisite	Types of Brick bond, Basic knowledge of water supply			
Co-requisite	Carpentry tools and Joints, Timber Residence model			
Anti-requisite				
	L	T	P	C
			150	6

COURSE OBJECTIVES

1. Timber as material and joinery details
2. Basics of plan and elevation

Course Outcomes

CO1	Design a house with timber
CO2	Illustrate constructional details using timber and stone
CO3	Confirm to Indian tradition, crafts and culture
CO4	Produce digital rendering of residence
CO5	Develop understanding of the environment and related issues

Continuous Assessment Pattern

Practical IA		
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VIVA 1	VIVA 2	VIVA 3	Practical VIVA 4 (ETE)	Total Marks
15	15	20	50	100

Course Content:

BARC1009 Architectural Design-II	67 Hours
Unit-I: Residence Design in Timber	
To Design a G+1 Building using timber as primary material, including doors, windows, flooring, walls, roof etc. in timber. Foundation can be done in stone.	
BARC1010 Building Construction-II	30 Hours
Unit-I: Timber and wooden products	
Timber: Definition, obtaining timber from nature (Selection, Felling and Transportation), Conversion of timber, Seasoning, Storage, Defects in timber and its preservation. Use of different types of wood in various parts of building. Industrial timber: veneers, plywood, fiberboard, etc. Bamboo: Basic concepts to use it as a building material. Applicable IS Codes for Timber.	
Unit-II: Carpentry in workshop	
Timber Joinery; types of joints, lengthening and widening joints, common joints for various building and furniture works	
Types, Classification, Usage & the application of various tools & machinery used in the process.	
Unit-III: Wooden Doors and Windows	
Doors: Details of doors which will include Basic Doors (Battened /ledged/Braced door), Flush Doors (both solid & hollow core flush doors) & paneled Door (both single & double shutter panel doors – in timber, wire mesh & glazed panel door.)	
Windows: Types of window which will include Casement window, fully glazed window, Ventilator Simple & pivoted, Fixed Glass window, louvered window, corner and Bay window. Hardware related to wooden doors & windows. Design & Details of Casement window. Introduction to Carpentry tools & basic techniques	

of carpentry; sawing, cutting, planning, chiseling and finishing. Understanding of timber joinery in construction and basic wooden joints for doors, windows and furniture.	
BARC1011 Building Structures	9 Hours
Introduction of Axial members and struts. Load distribution behavior of a column element. Failure of axial compression members in crushing and buckling. Behavior of RCC slabs. How the thickness of RCC slabs varies. One way and two way slabs. Drop slabs. Load distribution on a slab element	
BARC1017 Building Services-I	12 Hours
Water supply and sanitation details to be prepared for the timber building design.	
BARC1013 Computer Application in Architecture-II	7Hours
Google Sketch Up+ V-ray	
Basics of Google Sketch up, Drawing & Measurement Tools, creation of geometrical shapes & forms, union and intersection of forms. Application of color& materials. Introduction to editing tools, modifying existing shapes and forms, 3D drawings with site and surroundings, sciography & rendering in 3D drawings. Concept of camera and walkthrough.	
BARC 2016 Climatology	25 Hours
Unit I - Architectural Design as a Response to Climate	
Tool for Design in All climatic Conditions of India- Microclimatic Factors: Landform, topography, vegetation type and pattern, water bodies, street widths and orientation, ground character. Plan form and elements, building orientation, roof form, fenestration pattern, orientation and configuration, controls like shading devices, design of shading devices using available software's. Walls, choice of materials, roof materials, external colors and textures, layouts and internal finishes. (Ecotect and sketch up software may be used).Solar Passive Heating	

and Cooling Systems, roof pond, trombe wall, green house, air flow, stack effect, wind tower, earth air tunnel. Examples of Vernacular architecture of different climatic zones may be used to illustrate the above design processes.

Suggested Reading

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. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
5. Punmia, B. C. (1993) Building Construction, Delhi.
6. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi
7. Relevant IS codes
8. Learn to Timber frame by Will Beemer
9. Timber Frame Construction by Jack A.Sobon Graphic Guide to Frame Construction Fourth Edition, Revised and Updated by Rob Thallon
10. Climatology by Robert V. Rohli, Anthony J. Vega

Name of The Course	M 10: Sciography			
Course Code	ARMO 1010			
Prerequisite	Any Design project and rendering techniques			
Co-requisite	Rendering And 3D software			
Anti-requisite				
	L	T	P	C
			50	2

COURSE OBJECTIVES

1. To study and learn live sketching (building perspectives) to produce illusions, 3D perspectives

2. Understanding light, shades, shadows and depth 3D forms to produce depth in drawings.
3. To compile the semester work in a portfolio format

Course Outcomes

CO1	Apply knowledge of sciography in architectural drawings
CO2	Create digital portfolio of academic work
CO3	Do a Presentation of academic work
CO4	Analyze light and shade through Charcoal study
CO5	Construct a scale model of a timber residence

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC1009 Architectural Design II	30 Hours
<p>Unit-I: Produce short articles about own work. Introduction Importance of architectural research and writing. Concept Writing Language, Impersonal and formal language, Elements of style, Techniques. Visual Communication: Gestalt law of composition, using grids, typography, color, texture in composition of work in portfolio</p> <p>Unit-II: Model of Timber Residence Construct a scale model of a timber Residence with the use of proper Material</p>	
BARC1014 Architectural Graphics-II	7 Hours
<p>Unit-I: One Point Perspective Purpose and use of perspectives, Anatomy of a perspective-cone of vision, station points, picture plane, eye level horizon line, ground line, vanishing point, etc., One point perspective of simple objects, combination of geometrical forms, One point perspective of Interiors, Perspective of</p>	

simple household furniture items. Building exterior and interior perspectives.

Unit-II: Two Point Perspective

Introduction to two point perspective, perspective of simple blocks. Preparation of Perspective by innovative methods like approximate method, Diagonal Method, Grid Method etc. Other innovative methods of perspective presentation. Introduction to shortcut methods in perspective drawing. Freehand perspective drawing.

Unit-III: Sciography

Principles of drawing shade and shadow with point source of light and light from Sun. Drawing exercises of sciography of simple objects on ground, simple building element (projections like sunshade) on walls. Sciography of complex and curvilinear elements on ground and on walls.

BARC1013 Computer Application in Architecture-II

3 Hours

Suggested Reading

- 1) Lam, W. M. C. (1986). Sun-lighting as Form-giver for Architecture. New York: Van Nostrand Reinhold.
- 2) Olgyay, A. and Olgyay, V. (1976). Solar Control and Shading Devices. New Jersey:
- 3) Rendering with Pen & Ink: Robert W. Gill
- 4) The Color Source Book for Graphic Designers: Sadao Nakamiva
- 5) Sciography, book by Robert Pratt
- 6) Sciography, or Radial Projection of Shadows (Classic Reprint) Hardcover

Name of The Course	M11: LARGE SPAN			
Course Code	ARMO 2001			
Prerequisite	Architects philosophy, Load bearing calculations			
Co-requisite	Structural system, Trusses			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To understand aspects of large spans w.r.t Trusses

2. Anatomy of trusses, to acquaint the students to usage of building materials such as Timber and Hardware, Damp Proofing Courses and Cement Concrete.

3. To familiarize the students with construction techniques for use of the above materials in building works. And joinery in carpentry

4. To familiarize the student with the basic building construction practices on site/yard

Course Outcomes

CO1	Apply the basic concepts of concrete as a construction material
CO2	Illustrate various structural systems
CO3	Compare various properties of concrete through testing
CO4	Make scale models of structural systems
CO5	Justify the role of structural system in architectural design

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC2001 Architectural Design-III 26 Hours

Unit I: Structural Systems in Architecture

Structural Systems in Architecture –Truss Components, Classification and application in Architecture, Long Span Trusses: Advantages and Use, Types form, Materials, Load transfer etc Space Frame: its Formation and Applications in Buildings,. Model making, truss design and analysis

BARC2002 Building Construction-III 4 Hours

Unit I: Types of wooden and steel trusses

Types of wooden and steel trusses, related terminology and their applicability for various uses.

Detailing of timber/ steel trussed roofs, Truss lighting (North lighting). Tubular steel trusses, north light glazing, roof covering/sheets and drainage details of trussed roofs

Timber trussed roof, king post, queen post, built up truss. Timber staircase, balcony and canopy

BARC2003 Building Structures-III 15 Hours

Unit - I: Trusses

Load Bearing and Timber Structures Structural design and illustrative detailing of load bearing structure; load bearing wall and its foundation, isolated columns and its foundation. Introduction to structural design of beams, columns, foundations, roof trusses, floors, staircases and balconies in timber. Their functions and inter-relationships through force diagram, joints and connections. Structural design of simple trusses, beams and columns in timber.
Elastic Theorum, Roof Trusses - Calculation of dead load, live load, wind load and earthquake load - Design of Joints – supports - members for pitched roof truss and purlins, IS codes for steel.

BARC2014 Architectural Graphics –III 5 Hours

Unit-I Philosophy of Art

Renaissance: Giotto, Leonardo da vinci, Michael Angelo
Baroque : Rambrandt
Realism : Rodin, Ingres
Impressionism: Monet, Renoir, Gauguin, Van gaugh
Fauvism: Matisse

- BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.
- Foster, Stroud (1963) Mitchell’s Advanced Building Construction, Allied Publishers Private Limited, Bombay

Name of The Course	M12: Sociology			
Course Code	ARMO 2002			
Prerequisite	Product Design, History of architecture			
Co-requisite	Psychology, Creativity, Innovation			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

- Depicting expression, context, spatial via built form and materials
- Relation between history and technology

Course Outcomes

CO1	Analyze social behavior changes in an urban village
CO2	Organize social field surveys
CO3	Create art work based on social issues
CO4	Predict attitude and social behavior
CO5	Experience team work and social behavior patterns

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Suggested Reading

- Neufert Architects’ Data
- Time Saver Standards for Building Types: Joseph De Chiara & John Hancock Callender
- Strength of Materials & mechanic of Structure : B.C.Punmia
- Structural Mechanics & Analysis, : V.S.Prasad
- Basic Structural Analysis : C.S.Reddy
- Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.

Course Content:

BARC2001: Architectural Design-III 18 Hours
Unit I: User oriented design, understanding client behavior levels, Field surveys, questionnaire preparation, poster making on social issues. Conduct Capacity building in a low income/rural settlement.
Unit II Art studio: Develop a hands on approach, skills of working with different materials and the ability to choose

an appropriate material as and when required for presentation or design purposes. Working with model making materials like thermocol, paper, wire etc. Basic workshop techniques for carpentry and joinery, sheet metal work, fabrication and foundry as an extension to Building Construction course.

BARC2003 Building Structure-III 8 Hours

Limit State RCC Design -1 Introduction to R.C.C. structure. Type of structures and structural framing, structural components like tie, stirrups, beams, arch, vault, dome etc. Rigid jointed, pin jointed, moment of resistance of homogenous beams of rectangular cross section under / over and balanced sections for various grades of concrete and types of steel bars. Design of shear, development length and anchor length. Structural design of columns (axially loaded, short and long columns, eccentric loaded), isolated column footings. Structural design of simply supported, continuous, cantilevered, doubly reinforced beams. Structural design of simply supported, continuous, cantilevered, one way slabs.

BARC2006 Sociology & Psychology

Unit I Introduction:

Nature, scope and utility of Sociology, relation between Sociology and society. Human Development Index, Essential elements of society, bio-social and socio-cultural systems. Rural and urban communities and their characteristics. Origin, growth and influence of cities. Definition of urbanization – patterns of life and influence of urbanization on rural life, urbanization process in India.

Unit II Introduction to Urbanization

Migration and its impact on urbanization, social problems of urbanization – problems relating to public health, public transport and public housing, sociological understanding of slums. Social surveys and Social research – principles of social research, scope of research, units of study, choice of research topics, sources of information, literature review – official and unofficial documents, library references, publication etc., Field survey – adoption of suitable techniques in

field research viz., Questionnaires, interview, case study etc., analysis and classification of data

Suggested Reading

1. Neufert Architects’ Data
2. Time Saver Standards for Building Types: Joseph De Chiara & John Hancock Callender
3. Strength of Materials & mechanic of Structure : B.C.Punmia
4. Structural Mechanics & Analysis, : V.S.Prasad
5. Basic Structural Analysis : C.S.Reddy
6. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
7. BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.
8. Foster, Stroud (1963) Mitchell’s Advanced Building Construction, Allied Publishers Private Limited, Bomba

Name of The Course	M13: PAVILION			
Course Code	ARMO 2003			
Prerequisite	Plumbing Services, Large span			
Co-requisite	Basic introduction of all services, structural system			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. Large span structure
2. Cement Concrete
3. Early Christian, Byzantine, Romanesque, Gothic Architecture

Course Outcomes

CO1	Apply basic concepts of electrical and lighting services
CO2	Apply basic concepts of firefighting services
CO3	Apply basic concepts of lift and escalators in a multipurpose halls
CO4	Illustrate early Christian to gothic architectural history
CO5	Create multipurpose hall on the basis of structural systems

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

<p>BARC2001 Architectural Design-III 44 HOURS</p> <p>Unit -I Large Span Structure</p> <p>Architectural Design Process- Predesign, Site Analysis and Concept. Design of a Large-span multipurpose hall with incorporation of building services. Preparation of Design brief, performing case study, detailed drawing of foundation and cladding. 3d Model of Skin section and cladding details or be prepared</p>
<p>BARC2002 Building Construction-III 26 HOURS</p> <p>Unit -I Introduction to cement</p> <p>Cement Concrete: mixing, Curing, Water Cement Ratio, Qualities and workability Concrete using special materials: Lime, fiber reinforced, polymer, fly ash, silica fume concrete, Temperature control, water proof concrete etc. Test for concrete to be performed in concrete testing lab Introduction to RC, principles of design of RC, properties of ingredients, types of concrete, different grades of concrete, different tests, and visit to RMC plant.</p> <p>Unit –II Construction Details</p> <p>Introduction to RC frame structures, types of RC foundations in frame structure Details of beams and columns of RC frame structure with in-fills Introduction to folded plate and form active structures</p> <p>Unit-III Wall Finishing Materials</p> <p>Introduction to internal & external wall finishing materials, their properties, use and methods of application. Types of mortar, plasters (smooth, rough, textured, grit-wash), cladding etc.</p>

<p>Construction Details of external stone cladding & internal wooden panelling.</p> <p>BARC2003 Building Structure-III 28 HOURS</p> <p>Limit State RCC Design -2 Structural design of T and L beams and other sections, slabs spanning in two directions, flat slab, Introduction to various structural forms, viz. vaults, domes, shells, coffer slabs, folded plates, with an understanding of structural behavior through force diagrams. Indian Standard codes for different types of loads, Introduction of foundation engineering, Soil-foundation relationship, Indian standard guidelines in different types of foundations.</p> <p>BARC2004 History of Architecture-III 25 HOURS</p> <p>Unit I - Early Christian Architecture & Byzantine Architecture :</p> <p>Development of early church and Roman basilica. Interiors of churches and the articulation of interiors to create spiritualized space. Study of Italian basilicas and churches. Centrality and interiors of both cross domed and cross in square plan churches. Study of Interior and Exterior of churches. Construction of domes over polygonal compartments through the use of pendentives.</p> <p>Unit II - Romanesque Architecture</p> <p>Massiveness and verticality of medieval churches combination of five towered structures and longitudinal basilica. Gradual integration of tower from early to later examples. Integration of centralized and longitudinal plans. Articulation of external wall like arcaded interiors resulting in dematerialization of exterior. Study of important cathedrals and churches from Italy and France.</p> <p>Unit III - Gothic Architecture</p> <p>Continued integration of centralized and longitudinal plans. Spatial and formal integration of Romanesque churches. Integration of wall and vault. Ribbed vault and the dissolution external wall to allow light. Sensitivity to light and use of stained glass for mysterious interiors. Need and development of different external buttressing.</p>
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Study of important cathedrals and churches in France.
BARC2005 Computer Application in Architecture-III 6 HOURS
Photoshop and 3d software
BARC2007 Building services II 16 HOURS
<p>Unit 1 Introduction to Electrical Services</p> <p>Terminology and architectural symbols (as per NBC/NEC) for electric installations in buildings. Need to generate and save electricity, transmission and distribution of electricity (single and three phases), procuring service connection. Familiarization to various lighting accessories, wires and cables, metering, distribution panels / boards etc. for single and three phase supply. Guidelines for installation of fittings.</p> <p>.Unit II - Introduction to Firefighting services:</p> <p>Fire triangle/tetrahedron. Classes of fire. Combustibility of materials and fire resistance. Causes and spread of fire. Building Plans, Drawings, and Schematics.</p> <p>Lifts & Escalators:</p> <p>Brief history-types of Elevators like traction, Hydraulic etc., Double-decker, sky lobby, lift lobby, lift interiors etc., Definition and components of Elevator in a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc., Service requirements: Quality of service, quantity of service, time, passenger handling capacity, space and physical requirements, machine room spaces and their typical layout. Escalators – Definition, Application, Capacity, Location and Arrangement in buildings. Space requirement, Conveyor belts-movement of passengers and goods.</p> <p>Unit III - Introduction to Lighting services:</p> <p>Importance of lighting – Lighting in interiors – importance, classification based on sources, uses,</p>

<p>illumination, factors to be considered in lighting for different areas of house.</p> <p>Artificial lighting - light sources, types and uses of light, specific factors in lighting – measurements of lighting and economy in lighting, Psychological aspects of light, Avoidance of glare – Glare its types and prevention</p>
BARC2014 Architectural Graphics –III 5 HOURS
<p>Unit- I : Philosophy of art :</p> <p>Cubism : Picasso, Henry Moore, Duchamp Expressionism Paul klee, Chagall Surrealism : Dalis</p>

Suggested Reading

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. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
5. Punmia, B. C. (1993) Building Construction, Delhi.
6. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi
7. Relevant IS codes
8. Structural Systems in Architecture”, Ahmet Hadrevic, Book Serj Publishing, South Karolina.
9. Structure System” by Heinoengel,
10. Modern Architecture since 1900 – W.J. Curtis.
11. Structural System for Tall Buildings, CTBUH, McGraw-Hill, Inc.
12. National Electrical Code.
13. Electrical Design estimating and costing, by Raina K.B. & Bhattacharya S.K; New Age International (P) Limited, New Delhi, 2004.

14. Handbook of Lighting Design by Rudiger Ganslandt & Harald Hofmann, Druckhaus Maack, Lüdenscheid, 1992.
15. The Building Systems Integration Handbook, R Rush, 1991, American Institute of Architects
- 16.

Name of The Course	M14: R.C.C			
Course Code	ARMO 2004			
Prerequisite	Building Materials, Basic intro of all the services			
Co-requisite	Construction Materials, Electrical Services			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. Building Bye laws and rule regulations
2. Reinforce cement concrete
3. Western Architecture

Course Outcomes

CO1	Illustrate Reinforced Cement Concrete construction techniques
CO2	Apply Reinforced Cement Concrete structural analysis to a residence
CO3	Design institutional building for children with RCC
CO4	Illustrate architectural historical concepts from renaissance period to rococo period
CO5	Apply basic concepts of soil mechanics

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC2001 Architectural Design-III 61 Hours
Unit-I Building By Laws and Regulations

Introduction to building bye laws and regulation, Need and relevance, General definitions such as building height, building line, FAR, Ground Coverage, Set Back Line. Role of various statutory bodies governing building works like development authorities, municipal corporations etc. Introduction to Master Plan and understanding various land uses and related terminology. Development Authority Familiarizing with Building Bye-laws through NBC & Local Development Authority, State Housing board, etc. Interpretation of the Bye Laws applicable to residence in plotted developments, Group Housings, Commercial Buildings, Educational Buildings and other Public Institutions. Other statutory controlling authorities e.g. Water, Electricity, Fire, Airport, Archaeology BIS Codes Introduction to various BIS codes in building industry

Unit-II Site Planning

Introduction to building types and Density typology, Key plan, depicting context and site surrounding, building access, parking regulations as per NBC, special considerations for differently abled people in site. Showing site circulation-vehicular and pedestrian. Hardscape and Softscape. ROW, road width, types of open spaces, street and road typology
Theme Based Design

Unit-III Institutional Building Design :

Design institutional building in RCC

**BARC2002 Building Construction-III
45 Hours**

Unit-I: Introduction to RCC and Building Components

Introduction to RCC; Types, Mixing, Curing, Water Cement Ratio, Properties and Workability. Use of RCC in buildings. Relevant IS Codes for RCC works and tests. RCC Admixtures.

Introduction to RCC Components of a Building; Foundation, Columns, Beams, Walls, Slab retaining walls, expansion joints in RCC

<p>etc;Types of RCC Foundations, related terminology & details.</p> <p>Unit-II: Staircase</p> <p>Introduction to Staircase; its definition and related terminology. Types of Staircases, construction methods of – Masonry staircase, Timber staircase, RCC staircase, Steel Staircase and composite staircase. Study of fire escape staircase in view of building materials & construction technology.</p> <p>Unit-III: Building Components & Details</p> <p>Typical Building Sections of a Two Storied load bearing brick masonry and RCC framed building illustrating basic building components together with special features like toilet, staircase and DPC details.</p>
<p>BARC2004 History of Architecture-III 25 Hours</p>
<p>Unit-I: Renaissance & Baroque Architecture</p> <p>Background and influences on Renaissance Architecture. Characteristics of Renaissance Architecture in general. Eg: St Andrea, Mantua and Palazzo Rucellai by Leon Alberti, Villa Rotunda (Capra) by Palladio, (New) St Peter’s Rome by Michelangelo and others, St Paul’s London by Sir Christopher Wren. General characteristics of Baroque. Eg: St Peter’s Piazza by Bernini.</p> <p>Unit-II: Modern Movement in Europe</p> <p>Transitional Period – A brief account of the situation before the changeover to Modern architecture in Europe. Palladian Revival in Britain, Greek revival and Gothic Revival Eg: Chiswick House, London, Mereworth castle, Kent, St Pancras Church, London, West Minister Palace, London, Arc de Triomphe, Paris. Impact of Industrial Revolution in Europe – The Social, economic and political changes effected, new requirements of the society, new materials and technological developments.</p> <p>Unit-III: Modern Architecture in America</p> <p>The Chicago School – works of Louis Sullivan, Early Industrial buildings, Contributions of Bauhaus,</p>

<p>De Stijl movement, Italian Futurism, Art Nouevauvau movement and Arts and Crafts Movement to Modern Architecture.Eg: WainWright Building, St Louis, Guaranty Building, Buffalo, Crystal Palace, London. Bauhausschool at Dessau, Schroder house by Rietveld, Casa Mila, Casa Batlo, Sagrada Familia, Tassel House,Brussels, Paris Metro Station Entrance, Red house, Kent.</p> <p>and practices. Types of specifications. Knowledge of manufacturers’ specifications for construction materials/products. Specification of common building materials including carriage & stacking of materials. Specifications for a simple building. Standard specifications of BIS. General abbreviations used in specifications. Specification of new building materials..</p>
<p>BARC2005 Computer Application in Architecture-III 8 HOURS</p>
<p>V-Ray in Revit</p> <p>Introduction to basic understanding of other software like Architectural Desktop, Revit, Archicad, etc. 3D modeling (creating shades and shadows, attaching materials and rendering) Basic understanding of other applicable software for energy auditing, building simulation, BIM software etc.</p>
<p>BARC2007 Building Services- II 9 HOURS</p>
<p>Unit-I HVAC Services</p> <p>Need for mechanical ventilation in buildings. Rate of ventilation for different occupancies. Methods and equipment employed for mechanical ventilation in buildings. 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-outletsAir-conditioning methods and equipment: window units, split units and central Air conditioning systems. Location of air-conditioning equipment in buildings. Architectural requirement of various equipment.</p> <p>Unit-II Firefighting Services</p> <p>Fire Detection & Alarm Systems :</p>

Fire Detection Equipments - Heat and Smoke sensors. Fire Alarm Systems.

Fire Fighting & Extinguishing Techniques :
 First stage fire fighting equipment, Ladders, Snorkel Ladder. Fire fighting pump and water storage, Hose and hose fittings, Dry and wet risers, Automatic sprinklers. Fire Extinguishers - Portable fire extinguisher and other fire fighting equipments. Means of escape, Fire escape, Fire doors, and Water curtains.

BARC2014 Architectural Graphics –III 3 HOURS

Unity, Elements of unity. Texture, Color, Tone Directions, Proportions ,Form and shape, Solid and Voids

Age International (P) Limited, New Delhi, 2004.

23. Handbook of Lighting Design by Rudiger Ganslandt & Harald Hofmann, Druckhaus Maack, Lüdenscheid, 1992.

24. The Building Systems Integration Handbook, R Rush, 1991, American Institute of Architects

Name of The Course	M15: RENDER/ORGAMI			
Course Code	ARMO 2005			
Prerequisite	Art and architecture, Product Analysis			
Co-requisite	3d softwares, Model Making			
Anti-requisite				
	L	T	P	C
			50	2

Suggested Reading

10. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
11. BIS (2011) National Building Code, SP 7, Bureau of Indian Standards.
12. Foster, Stroud (1963) Mitchell’s Advanced Building Construction, Allied Publishers Private Limited, Bombay.
13. Prabhu, Balagopal T. S. (1987) Building Drawing and Detailing, Spades Publishers Pvt. Ltd., Calicut.
14. Punmia, B. C. (1993) Building Construction, Delhi.
15. Singh, Gurucharan (1981) Building Construction Engineering, Standard Book House, New Delhi
16. Relevant IS codes
17. Structural Systems in Architecture”, Ahmet Hadrevic, Book Serj Publishing, South Karolina.
18. Structure System” by Heinoengel,
19. Modern Architecture since 1900 – W.J. Curtis.
20. Structural System for Tall Buildings, CTBUH, McGraw-Hill,Inc.
21. National Electrical Code.
22. Electrical Design estimating and costing, by Raina K.B. & Bhattacharya S.K; New

Course Objectives

1. Development of art and graphics skills
- 2.3d Visualization and Rendering Techniques
3. Understanding of origami concept

Course Outcomes

CO1	Analyzing and designing of new and complex origami.
CO2	Understanding and analysis of Rigidity theory and Tensegrity.
CO3	Generate model to understand fold and joint in origami
CO4	Making of multi-dimensional model using grasshopper
CO5	To develop the ability to move between digital representations and physical constructions.

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC2001 Architectural Design-III 26 HOURS
Origami intro: Origami alphabet, higher dimensions

Universality: Terminology history, practical strip folding, pseudopolynomial bounds, seam placement, hide gadget via simple folds.

Simple folds: Metal/wood/plastic motivation, definition, examples, linear-time algorithm, extra creases

Single-vertex crease patterns: Linear-time algorithm, local foldability examples, T-shirt folding, higher dimensions, why flat foldability.

Efficient origami design: Uniaxial, TreeMaker and Origamizer in practice, box-pleating tree method, tree method triangulation, universal molecule, gift wrapping, checkerboard gadgets, Origamizer software vs. mathematics, vertex/edge tucking molecules, Voronoi diagrams.

Artistic origami design: Jason Ku designs, other materials (dollars, cardboard, hydro, metal, polypropylene), tessellations, Tess, connected cranes, modular origami, business card cubes.

Architectural Origami: Origamizer, Freeform Origami, Rigid Origami Simulator.

Universal hinge patterns: Box-pleating history, maze-folding prints.

NP-hardness: Simple foldability, crease pattern flat foldability.

Fold and one cut: Software, scissor vs. mathematical cuts, tree folding, density, examples, how many disks, comparison to tree method, continuous flattening.

Pleat folding: Triangulated hypars, smoothness, normals, mathematical vs. real paper, pleat folding algorithms, hypar folding.

Folding motions: Trouble with holes.

Linkages to sign your name: Sliding joints, contraparallelogram bracing, higher dimensions, semi-algebraic sets, splines.

Geometric construction: Straight edge and compass, origami axioms, angle trisection, cube doubling.

Rigidity theory: Pebble algorithms, rigid component decomposition, body-and-bar framework, angular rigidity, 5-connected double bananas.

Tensegrities: Dot products, springs, software, sculpture.

Locked linkages: Why expansiveness, energy algorithm correctness, pointed pseudotriangulations (combinatorics, rigidity,

universality, expansiveness, extremeness), linear equilateral trees can't lock, unfolding 4D chains.

Hinged dissections: Animations, polyform inductive construction, rectangle to rectangle, furniture, pseudopolynomial construction, 3D, Dehn invariant.

Polyhedron unfolding: Handles, holes, ridge trees; sun unfolding; zipper unfolding; more unfoldable polyhedra; NP-completeness of edge unfolding; band unfolding; continuous blooming. Polyhedron unfolding: Topologically convex vertex-unfoldable polyhedron, unfolding orthogonal polyhedra with quadratic refinement.

Polyhedron folding: Pita forms, D-forms, seam forms, convex hull and crease properties, rolling belts, Burago-Zalgaller folding into nonconvex polyhedra.

Polyhedron refolding: Fractal unfolding, three boxes, flat boxes.

3D linkage folding: ribosomes, HP protein folding NP-hardness, flattening is strongly NP-hard, flips, flipturns, deflations, pops, popturns.

**BARC2005 Computer Application in Architecture-III
11 Hours**

Unit I : Using and Exploring 3D Models

Specify 3D views, Define a 3D view with a camera, Create preview animations, Create motion path animations, Creating a simple 3D mesh, Editing faces and edges, Creating mesh surfaces, Converting meshes to solids, Editing surfaces.

Grasshopper

**BARC2014 Architectural Graphics –III
13 HOURS**

Unit I-Theory of Design :

Aspects of Unity: Dominance , Harmony , Propotion, Rhythm , Vitality

Suggested Reading

1. Barrier free designs :James Holmes- Seidle
2. Barrier free design : Oliver Heiss,
3. Rendering with Pen & Ink: Robert W. Gill

4. The Color Source Book for Graphic Designers: Sadao Nakamiva

Name of The Course	M16: VERNACULAR ARCHITECTURE			
Course Code	ARMO 2006			
Prerequisite	Climatology, Sociology, psychology			
Co-requisite	Environmental study related to architecture			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Building services/acoustics as prerequisite
2. Human Values and professional ethics
3. Vernacular architecture in India-Sheets models and analysis.

Course Outcomes

CO1	Analyze concepts of vernacular architecture in different regions of India
CO2	Apply basic principles of acoustics in built environment
CO3	Display professional commitment to ethical practice on every day basis
CO4	Make scale models of various styles of vernacular architecture in groups
CO5	Illustrate basic application of vernacular architecture in contemporary scenario

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC2009 Architectural Design-IV 26 Hours
Unit-I : Elements of Vernacular Architecture
Study of vernacular architecture, emerging out of the traditional way of life of the people in a given climatic context and region. Understanding how the social and physical environment, climate of the place, materials and methods of construction

impact vernacular architecture. Study and analysis of vernacular architecture of various regions and climatic zones in India on the basis of given parameters.

Unit-II :Regional Variations in Built Form:

Tribal Architecture
Settlement Pattern, Dwelling Typology, Symbolism, Typical features, Construction materials and techniques. Andhra Pradesh, Madhya Pradesh, Odisha (Kondha and Santals) and Northeast (Naga and Khasi tribes).

Unit- III : Adaptations in Contemporary Architecture

Sustainable building materials and construction techniques, Works of Laurie Baker, Hasan Fathy, Anil Laul, Gerard Da Cunha, Building Centres-Auroville, Anangpur, Nizamuddin Building Centre.

**BARC2012 History of Architecture-IV
4 Hours**

History of Indian Vernacular Architecture – Documentaries etc.
Contribution of society, social structure and culture on the development of Vernacular architecture; High rise and low-rise structure – design approach with social perspective.

**BARC2015 Building Services III
5 Hours**

Architectural Acoustic
Introduction to the study of acoustics – nature of sound, basic terminology – frequency, pitch, tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound and distance – inverse square law. Behavior of sound in enclosed spaces. Absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine’s and Eyring’s formulae, sound absorbents, porous materials, panel or membrane absorbers and cavity or Holmboltz resonators, role of functional absorbers. Absorption coefficients of indigenous acoustical materials, use of IS code 2526-1963.
Material- Internal finishing and details.

**BARC 2020-Environmental Studies
15 Hours**

Introduction to Ecosystems and Environment, environmental resources Types of ecosystems, characteristics features, structure and functions of Ecosystems – Forest, Grassland, Desert, Aquatic (lakes, rivers and estuaries). Land, Forest, Water and Energy as environmental resources.

Suggested Reading

1. Brunskill, R. W. (1987). Illustrated Handbook of Vernacular Architecture. Castle Rock: Faber & Faber.
2. Carmen, K. (1986). VISTARA – The Architecture of India. The Festival of India Publications.
3. Jain, K. and Jain, M. (1992). Mud Architecture of the Indian Desert. Ahmadabad: Aadi Centre.
4. Agarwal, K. C. (2001). Environmental Biology. Bikaner: Nidhi Publications Ltd.
5. Benny, J. (2005). Environmental Studies. New Delhi: Tata McGraw Hill.
6. Bharucha, E. (2005). Text book of environmental studies for undergraduates courses.
7. Barron. M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor & Francis.
8. Conceptnine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.
9. Architectural Acoustics (Applications of Modern Acoustics) 1st Edition by Marshall Long.

Name of The Course	M17: STEEL			
Course Code	ARMO 2007			
Prerequisite	Construction detail of Rcc structure			
Co-requisite	3D model of steel joint details			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Create an Abstract form using steel as a material – innovative 3D form
2. All the construction details to be designed in steel –cladding, foundation, anchor, counterweights
3. Apply a function to the abstract form in human scale
4. Result in terms of model with humans and constructing details in steel, INSDAG brief

Course Outcomes

CO1	Analyze structural design of steel buildings
CO2	Apply basic concepts of steel as a construction material
CO3	Design an abstract (conceptual) form using steel as a building material
CO4	Illustrate steel construction details
CO5	Make a scale 3 dimensional model with steel

Continuous Assessment Pattern

Practical IA			Practical	Total Marks
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	
15	15	20	50	100

Course Content:

BARC2009 Architectural Design-IV 9 Hours
Design in Steel, Case studies of steel buildings, IS Codes of steel construction
BARC2010 Building Construction-IV 15 Hours
Unit- 1: Structural Steel Works Typical metal joinery - Mechanical (riveted & bolted), Soldering and Brazing and welding. Detailing of structural steel work – Beam to Column joint, Beam to Beam joint, Column Splice, Column Base, and Roof Truss to Column joint. IS codes for steel members.
Unit -2: Doors & Windows (Metals) Mild steel L and Z section Pressed steel section. Steel windows, their types, various sections and elements used in construction / fabrication. Relevant IS Codes for steel doors & windows.
Unit -3: Shutters (Operational Mechanisms)

<p>Complete understanding of operational mechanism (automatic and manual) of variety of Rolling shutters and Collapsible shutters.</p> <p>Unit- 4: Industrial Construction Structural Steel Works: Portal Frame Construction, north-light truss and lattice girder roof with various roof coverings.</p>
<p>BARC2011 Building Structures-IV 9 HOURS</p>
<p>Introduction of Steel structures. Types and grades of steels and types of steel members. Introduction of IS Code: 800. Steel structure components and joints. Safety measures for steel elements. How the structural assembly of steel structures differs for other structures. Applications of bolts, welds, steel plates.</p>
<p>BARC 2013 Computer Application in Architecture-III 6 HOURS</p>
<p>Unit-I: Mastering in Revit Architecture</p> <p>Introduction, Modifying the view, Common tasks, System options, File locations, Spelling options, Settings,</p> <p>Unit-II: Building the Model and Modify</p> <p>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.</p>
<p>BARC2015- Building Services-III 8 HOURS</p>
<p>Sound -Properties of Sound, room acoustics. Acoustical defects, sound absorbing materials and sound proof construction. Reverberation, Reverberation time for speech and music and its calculation. Acoustical requirement of various building type. Understanding Auditorium design – defects, ways of overcoming these defects. Noise Control: Means and measures for control, noise insulation, and noise control requirements, constructional details and performance. Environmental Noise Control.</p>
<p>BARC 2020-Environmental Studies 4 HOURS</p>

<p>Bio-diversity and its conservation Value of bio-diversity - consumptive and productive use, social, ethical, aesthetic and option values. Bio-geographical classification of India – India as a mega diversity habitat. Threats to biodiversity- Hotspots, habitat loss, poaching of wildlife, loss of species, seeds etc. Conservation of bio-diversity, in-situ and ex-situ conservation</p>

Suggested Reading

1. Bansal, R. K. Engineering Mechanics. New Delhi: Laxmi Publications.
2. Junnarkar, S. B. (1991). Mechanics of Structures. Vol. 1. 20th Ed. Delhi: Charotar.
3. Kurmi, R. S. Strength of Materials. New Delhi: S. Chand & Company.
4. Building Construction Handbook by Roy Chudley and Roger Greeno.
5. Barron. M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor & Francis.
6. Conceptnine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.
7. Architectural Acoustics (Applications of Modern Acoustics) 1st Edition by Marshall Long.
8. Brunner, R.C. (1989). Hazardous Waste Incineration. New Delhi: McGraw Hill.
9. Kaushik, A. and Kaushik, C. P. (2010). Basics of Environment and Ecology. New Delhi: New Age International Publishers.

Name of The Course	M18: DECODING PATTERN			
Course Code	ARMO 2008			
Prerequisite	Steel sections and its joinery details			
Co-requisite	Basic elements of climate and types of climate zone			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. Understanding patterns from city core to a room
2. Relation of space and form in different scales
3. Art thesis- report on the process of deriving the art form, inspiration, creativity, installation

SCHOOL OF ARCHITECTURE

process etc. 2D patterns and explanation, study of architectural pattern, deriving a 3D pattern, 3D Art installation

4. Study Tour on Climate responsive architecture.

Course Outcomes

CO1	Analyze patterns in built form and nature
CO2	Illustrate architectural history from Vedic to Dravidian period
CO3	Organize and plan a study trip
CO4	Create an art installation based on patterns (art thesis)
CO5	Illustrate construction details related to non-ferrous metals, GRC , UPVC, Plastics rubbers and asbestos

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

<p>BARC2009 Architectural Design-IV 70 HOURS</p> <p>Study of Hierarchy In interiors, in building, in street in neighborhood- Figure ground, site analysis, site inventory. Study of the built environment and to develop a basic understanding of space and form. Looking at the immediate built environment and understanding its fundamental components and their impact on the surroundings. Analysis of Architects work and deciphering pattern in their work Drawing techniques and methods.</p> <p>Deep dive studios Systems approach/ scientific approach to introduce significance of theoretical and philosophical dimensions in architecture.</p> <ul style="list-style-type: none"> Objective knowledge vs. Subjective Ideas. Distinction of & relationship between Science and Philosophy. Rational process and Empirical process. Rules, Formulas, Principles and Theories. Accuracy vs. Indeterminacy in Design. Analytic approach vs. Mimetic approach. Old Architectural treatises in Europe and India. <p>Study tour</p>

City Core
BARC2010 Building Construction-IV 30 HOURS
Building materials- Rubber, GRC, Ferro-cement, UPVC, Non-Ferrous Metals, Plastics, Asbestos, water proofing materials
BARC2012 History of Architecture-IV 25 HOURS
<p>Unit-I: Vedic Period Aryan / Vedic Civilisation Timeline with reference to Indus Valley Civilisation, settlement planning pattern and Town forms by planning pattern (Dandaka, Nandyavarta etc.), typical Vedic village, shelter types by shape and material used, Torana and Sacred railings. The Vedic civilization; Layouts of Aryan Village, type of dwellings and building materials.</p> <p>Unit-II: Jain & Buddhist Architecture Evolution of Jain & Buddhist Architecture; Development by Ashoka, Hinayan & Mahayan styles of Buddhist architecture, Stupas, Monolithic Pillars, Rock cut architecture (Chaityas & Viharas), Monestries, Rock edicts, Gandhar style.</p> <p>Unit-III: Evolution of Temple Architecture Beginning of Hindu Temple Architecture under the Guptas and Chalukyas. Architectural features of buildings/temples, construction technology, building materials of Chalukyan style; Early Chalukyan Architecture, Later Chalukyan Architecture. Evolution at Badami, Aihole and Pattadakal, examples such as Ladh Khan, Durga, Maleguti, Papanath Temple.</p> <p>Unit-IV: Developments in Temple Architecture Architectural features of buildings/temples, construction technology, building materials of Indo Aryan Style; Orissa Style – Kalinga Style, Khajuraho Style, Gujrat & Rajasthan Style. Dravidian Style; Pallava Style, Chola Style, Pandya Style, Vijayanagar Style. Late Pandya Style or Madura Style.</p>
BARC2014 Architectural Graphics-III 13 HOURS
UNIT I History of Indian Art , from earliest times to Mauryan Period. Gupta Period to Mughal Period, Company Style (British Period). Renaissance in Indian art i.e. 19th century, Post-independence art of India. Contemporary arts and

artist in India, Works of Abanindra Nath Tagore, Nand Lal Bose, Jamini Roy, Amrita Sher Gill, M.F. Hussain, Satish Gujral and S.H.Raza.

Unit- II: Design of various objects.

Designing of gate, grill, railing, Jaali, in suitable materials.

BARC2011 Building Structures-IV 13 HOURS

Principals of Steel Structure Design

Members under combined stresses: Beams and Columns

Theory of columns, slenderness ratio, design of axially loaded steel columns, design of built-up lacing and battened columns. Theory of columns, slenderness ratio, design of axially loaded steel columns, design of built-up lacing and battened columns.

Suggested Reading

1. Timeless way of Building and Pattern language by Christopher Alexander.
2. Indian Architecture (Buddhist and Hindu Period) by Percy Brown.
3. Encyclopedia of Indian Temple Architecture by IGNC A
4. Elements of Indian Art: Including Temple Architecture, Iconography and Iconometry by S.P Gupta.
5. The History of Indian Art Paperback – 2 Jan 2017 by Anil Rao Sandhya Ketkar
6. Bhavikatti, S. S. (2010). Design of Steel Structures. I.K. International Publishing House.
7. Duggal, S. K. (2000). Design of Steel Structures. Tata McGraw Hill Education.
8. Ram, K. S .S. (2010). Design of Steel Structures. Pearson Education India.

Name of The Course	M19 : CLIMATE RESPONSIVE ARCHITECTURE
Course Code	ARMO 2009
Prerequisite	Different types of climate zones in India
Co-requisite	Use of Environmental Instrument
Anti-requisite	
	L T P C
	150 6

Course Objectives

1. To produce a set of working drawing and GFCs of project
2. Indian History of Islamic Architecture
3. Trip report
4. Climatology
5. Environmental Lab

Course Outcomes

CO1	Internalize energy conscious concepts in built environments
CO2	Design of hostel building based on principles of sustainability
CO3	Create working drawings of a building
CO4	Construct and simulate a scale model of building
CO5	Illustrate Indian architectural history from Islamic to Colonial period

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC2009 Architectural Design-IV 70 Hours

Design of climate responsive hostel building, with due emphasis to contextual issues such as climate, topography, local architectural character etc., using passive cooling techniques, and strategies taught during the module.

BARC2010 Building Construction-IV 11 Hours

Unit-I: Expansion Joints

Introduction to expansion joints, need and their types, design criteria as per IS codes, construction details at foundation, walls, floor and roof level. Study of materials used in their construction, filling and finishing.

Unit-II: Building Chemicals

Anti-termite treatment to foundation, masonry walls and wood work (pre-construction) water proofing and weather proofing materials like chemical admixtures and surface applications, sealants for water, smoke and fire proofing. Pest & rodent control treatment.

<p>Unit-III: Interior Materials & Details Types & Details of Internal Partition & False Ceiling systems. Design and detailing of wardrobes, modular kitchens, cabinet shelves and show cases for residence, offices, book stores and commercial buildings, work stations using materials like plywood, PVC, marble, granite, cement, fibre board, gypsum products, particle board, wood wool, straw and any other materials introduced in the market.</p>
<p>BARC2012 History of Architecture-IV 20 Hours</p>
<p>Unit-I: Introduction to Islamic Architecture Introduction and understanding of “Islam’s” philosophy and its interpretation in building types – Mosque, Tomb, Fort and their elements like dome, arches, minarets etc. Typical Layout of Mosque, its features and related nomenclature. Islamic Architecture Worldwide – Persia, Turkish, Arabian and their typical features Unit-II: The Imperial Style With reference to the Slave, Khalji, Tughlaq, Sayyid & Lodi Dynasties. Explanation with examples of the buildings, construction technology, building materials used, evolution of form and development with significant changes over the time period. Unit-III: The Provincial Style Architecture at Punjab & Bengal, Gujrat, Bijapur, Jaunpur, Malwa and Deccan. Explain with examples of the buildings, construction technology, building materials used, evolution of form and development with significant changes over the time period. Unit-IV: Mughal Architecture Concepts of city planning of various Islamic towns like Shahajahanabad and Fhatehpur Sikri. The Architecture developed under the rein of Babur, Humanyu, Akbar, Shahajan Period and later Mughal period and its implication on Indian traditional architecture. Explain with examples of the buildings, construction technology, building materials used, evolution of form and development with significant changes over the time period. Unit V: Colonial Architecture</p>

<p>Colonial architecture and its amalgamation into India Architecture.</p>
<p>BARC2015 Building Services III 28 HOURS</p>
<p>Unit I: Electrical Illumination Introduction Terminology and unit. Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light. Electromagnetic spectrum and visible radiation. Unit II: Illumination Types of illumination schemes e.g. Ambient, Task, Focal and Decorative etc. lighting. Design considerations for illumination Schemes. Methods for lighting calculation – Watts per square meter, Light flux and Point to point method. Unit III: Sources of light Familiarization and understanding of electrical sources of light e.g. Thermal radiators - Incandescent, Halogen. Discharge lamps – Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon), High pressure (mercury, metal halide, sodium). New technologies - LED, Fiber optics. Unit: IV Luminaries Types of Luminaries – Indirect, Semi-indirect, General diffusing, Semi-direct and Direct. Market survey of the luminaries available in market, and their cost.</p>
<p>BARC 2020-Environmental Studies 18 HOURS</p>
<p>Unit-I:Environmental problems in India Local and Global Issues, Causes, effects and control measures of Air pollution, Indoor air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Solid waste management, composting, vermin culture, Urban and Industrial wastes, recycling and re-use. Nature of thermal pollution and nuclear hazards, Global warming, Acid rain and Ozone layer depletion. Unit-II: Social issues and Environment Social issues and the environment, from unsustainable to sustainable development, urban problems related to energy; human population and environment-population explosion, resource exploitation and depletion, human-wild conflict, loss of wet lands, mangroves, increasing desert areas, spread of diseases. Unit-III: Institutions and Governance Introduction to Government regulations, Monitoring and</p>

enforcement of environmental regulations, Introduction to Environmental Acts, viz., Water (Prevention and Control of Pollution) Act, Air Prevention and Control of pollution act, Environmental Protection Act, Wild life protection Act, Forest Conservation Act, etc.

Suggested Reading

1. Brown, P. (1983). Indian Architecture (Islamic Period). Bombay: Taraporevala and Sons.
2. Catherine, A. (2001). Architecture of Mughal India. Cambridge University Press.
3. Faulkner, H. T. (1953). Architecture through the Ages. New York: Putnam Adult.
4. Grover, S. (2002). Islamic Architecture in India. New Delhi: CBS Publications.
5. Harris, M. C. (1977). Illustrated Dictionary of Historic Architecture. New York: M. Courier Dover Publications
5. Bhavikatti, S. S. (2010). Design of Steel Structures. I.K. International Publishing House.
6. Duggal, S. K. (2000). Design of Steel Structures. Tata McGraw Hill Education.
7. Ram, K. S .S. (2010). Design of Steel Structures. Pearson Education India.
8. IS 732: 1989 - Code of Practice for Electrical Wiring Installations.
9. “Electrical Design & Drawing: with estimation and costing”, Surjit Singh, Dhanpat Rai & Co (p) Ltd., 2007.
10. “Lighting Design Handbook”, Lee Watson, McGraw-Hill Inc., USA, 1990.
11. “Architectural Lighting Design”, Gary R. Steffy, Van Nostrand Reinhold, 1990

Name of The Course	M20 : FACADE			
Course Code	ARMO 2010			
Prerequisite	Types of Interior materials and construction details			
Co-requisite	Construction and fixing details of facade materials			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Study different types of façades
2. Market survey
3. Case study of corporate building.
4. Introduce environmental simulation software like Ecotect, 5. Design Builder and IES

Course Outcomes

CO1	Relate outer surface of buildings with its structure for performance improvement
CO2	Create a building façade
CO3	Analyze Glass as Building material
CO4	Appraise manufacturing and processing of glass through industrial visit
CO5	Justify the role of facade system in built environment

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

<p>BARC2010 Building Construction-IV 19 HOURS</p> <p>Unit-I: Glass & Glazing Introduction to Glass as building material, history of glass, manufacturing and properties of various types of glass like plate, tinted, decorative, reinforced, laminated glass block, fiber glass, glass murals, partially coloured glass, etching of glass and its applications in building industry for both exteriors and interiors. Glass fabrication techniques. Application of glass in buildings, types of glazing, fixing methods, related hardware and construction details of glass curtain wall and structural glazing.</p>
<p>BARC2011 Building Structures-IV 04 Hours</p> <p>Façade development, Load calculation of different types of cladding on external walls, fixing of different claddings such as curtain glazing and their load impact on external walls of the building.</p>

BARC2019 Architectural Graphics-III 13 HOURS
Lectures on outline of contemporary Architecture in Indian sub-continent and developing the pattern and style in the building façade development.
BARC2013 Computer Application in Architecture-III 15 HOURS
Unit-1: Overview of Energy Simulation Software and Introduction Hands-on experience of modeling in the software along with introductory parameters and their studies like: Climatic analysis, shadow analysis, material selection etc.
Unit-II: Lighting Calculations and inferences for day lighting and application of artificial lighting along with its analysis Thermal Comfort: Calculations for thermal comfort of spaces and its associated parameters like heat gains-losses, temperature profiles, fabric gains-losses, ventilation etc
Unit-III: Add-on Software Introduction and Hands-on with allied and compatible software like Radiance, P MV, Solar Tool etc

Suggested Reading

1. Lam, W. M. C. (1986). Sun-lighting as Form-giver for Architecture. New York: Van Nostrand Reinhold.
2. Barron. M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor & Francis.
3. Conceptnine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.
4. Cox, T. J. and D'Antonio, P. (2009). Acoustic Absorbers and Diffusers. 2nd Ed. Taylor & Francis
5. Cuttle, C. Lighting by Design. 2nd Ed. Architectural Press.
6. Eagan, D. M. (2002). Architectural Lighting, 2nd Ed. McGraw-Hill.

Name of The Course	M21: Cogent 1
Course Code	ARMO 3001

Prerequisite	Sociology, Language of Architecture. Art & Architecture			
Co-requisite	History of Architecture, Modern Architecture			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To study various philosophies in and philosophers in popular literature
2. To identify established theoretical framework in architecture and aesthetics and categorize essential theoretical aspects in architectural studies.

Course Outcomes

CO1	Design an art gallery based on International philosophies
CO2	Appraise renowned International architects work to understand their design philosophies
CO3	Appreciate various design styles and movements
CO4	Make a scale model of art gallery
CO5	Analyze basic trusses and frames

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3001: Architectural Design-V 34 Hours
<u>Philosophy and Philosophers</u> Idea of challenging the norm, questioning and analyzing the philosophies, manipulation and debate. Learning through Videos on sociology. Following philosophers shall be studied individually and discussed – Plato, Aristotle, Immanuel Kant, Karl Marx, Michel Foucault, Jacques Derrida, Friedrich Nietzsche, Rene’ Descartes, David Hume, Jean Paul Sartre, Martin Heidegger, Socrates, Confucius.

Popular philosophers in Architecture – Patric Schumarker, Christopher Alexander, Charles Jenx, Kevin Lynch, Jane Jacobs.
 Design Evaluation and Criticism: Value judgments in design, Appreciation of designer’s skills, theories of perception and variability of perception. Theoretical issues in contemporary architectural though, Seminars on the works of selected Indian and International architects and related topics.

BARC3004: Theory of Design

12Hours

Modern Architecture Social intentions and search for ideal world. Pluralism in place of past unity of styles. Search for paradigms in historical sources: It return to fundamentals and origins in geometry, nature and paradigms of technology.

Expressions of construction and technology. Equating technology and progress with present. Functionalism and functional appropriateness. Thoughts and works of Frank Lloyd Wright, Walter Groupies, Le Corbusier, Miesvander Rohe, Alvar Aalto, Louis Kahn, Dutch De Stijl Italian futurists and Russian Constructivists. International style: Oversimplification of the modern Movement into functional, steel and glass, cubes. Monotonous functionalist abstractions and Modernism as a style.
 Disenchantment of modern cities and fall of modern Movement.

Post Modern Architecture

Post modern architecture as a revision of modern architecture and resistance to functional containers of 60’s. Objective, representational and emphasis on content. Pluralistic and differing trends.

Post Modern – Historicism

Rooted to place and history. Regards of expression: ornaments, symbolism and context with irony and humour, exemplified through the works of James Stirling, Michael Graves, Charles Moore, Arata Isozaki

**BARC3003: Building Structures-V
4Hours**

Introduction to Shear and Development Length in Beams

Understanding of Shear stress, Diagonal tension, Shear reinforcement, Spacing of shear reinforcement, Problems of shear reinforcement,

Development length, Anchorage bond, Flexural bond.

Suggested Reading

1. Architecture: Form, Space, & Order by Francis D. K. Ching
2. Experiencing Architecture by Steen Eiler Rasmussen
3. The Puzzle of Architecture by Robin Boyd
4. The language of Post-Modern Architecture by Charles Jencks
5. Architectural Composition by Rob Krier
6. Architecture as Space by Bruno Zevi
7. Ferdinand, L. S. (1975). Engineering Mechanics: Statics and Dynamics. 3rd Ed. New York: Harper Collins Publishers.
8. Junnarkar, S. B. (1991). Mechanics of Structures. Vol. 1. 21st Ed. Delhi : Charotar.

Name of The Course	M22: Cogent 2			
Course Code	ARMO 3002			
Prerequisite	Sociology, Language of Architecture. Art & Architecture			
Co-requisite	Theory of Design, Theory of Architecture			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. Develop and understanding of architectural theories and act of being in time.
2. Analyse and learn from master architect’s philosophies.
3. Incorporate Philosophies in their work.
4. To strengthen the students’ knowledge about fundamental structural forces in trusses and arches and the methods of analysis and load calculations.

Course Outcomes

CO1	Design an art gallery based on International philosophies
CO2	Appraise renowned International architects work to understand their design philosophies
CO3	Appreciate various design styles and movements
CO4	Make a scale model of art gallery
CO5	Develop own Philosophy/Rational thought process

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3001: Architectural Design-V 09 Hours
<u>Application of design philosophies</u> Design of an Art Gallery based on the Philosophies and works of various architects.
<u>Unit I: Theory of Architecture</u> Digitalization, utopia, deconstruction, fluidism, parametric design, morphism, modernism, classicism, minimalism, regionalism, brutalism, blobitecture, schism, expressionism, cubism, duality
<u>Unit II: Architects Work</u> Frank Lloyd Wright, Le Corbusier, Hassan Fathy, Piter Issenman, Mario Botta, Nervey, Renzo Piano, Richard Roger, Santiago Calatrava, Ebenzer Harvard, Richard Mier, Ciser Pelli, Felix, Bernard Tshumi, Zaha Hadid, Eero Saarinen, Charles Correa, B V Doshi, Raj Rewal, AP Kanvinde
BARC3003: Building Structures-V 30 Hours
<u>Unit-II: Design of trusses</u> Design of simple trusses, beams and columns in steel and timber, riveted and bolted joints
<u>Unit- III: Load calculations in trusses</u>

Importance of selection of materials based on the load carrying capacity and the combination of loads as per Standard codes.

BARC3004: Theory of Design
21 Hours

Unit-IV: Neo - Modern
Disregard historical imaginary to recapture ideas for modern architecture of 20's. Hi-tech metal abstractions of Richard Rogers, Normal Foster, showing structure and equipment as implied ornament. References of Russian Constructivists. The early works of New York Five including later works of Richar Mier as complicated, exaggerated and sophisticated revival of the modern grid and Corbusier's geometry. Synthesis of Hi-Tech and Historicism in the works Aldo Rossi, Mario Botta, Cesar Pelli.

Suggested Reading

1. Architecture and Disjunction by Bernard Tschumi
2. Complexity and Contradiction in Architecture by Robert Venturi:
3. The Ten Books on Architecture by Vitruvius
4. Architecture as Space by Bruno Zevi
5. Space Time and Architecture by Sigfried Giedion
6. Ramamrutham, S. (2008). Engineering Mechanics: A Textbook of Applied Mechanics. New Delhi: Dhanpat Rai Publishing Company.
7. Timoshenko, S., Young, D. H. and Rao, J. V. (2007). Engineering Mechanics. 4th Ed. New Delhi : Tata McGraw-Hill Education.

Name of The Course	M23: DIONYSIA			
Course Code	ARMO 3003			
Prerequisite	Universal Design, Large span and Decoding Pattern			
Co-requisite	Building Acoustics, Building Specification, Working Drawing			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To develop script, drama performance, apply history of, Auditorium design, apply acoustics.
2. Scripting, Acoustics, performance, set design, Video Making, Lighting and sounds, VR, Temperature control, AC control, Camera setting.
3. To generate design concepts for the given project and integrate learning from other allied subjects to the design proposal.

Course Outcomes

CO1	Analyse large span roof forms
CO2	Design an auditorium
CO3	Apply the principles of acoustics in design of auditorium
CO4	Compose a drama script and enact the same in groups
CO5	Illustrate architectural history from modern to Contemporary period

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3001: Architectural Design-V 29 Hours
<p><u>Design for Dramatics</u> Introduction to designing of performance space-auditorium, theatre, cinema hall types on an intermediate scale. Importance of space programming, case studies and site analysis in architectural design. Importance of culture/traditions, and building byelaws in shaping built forms. Developing roof forms for large span structures, Angle of vision, types of Auditorium, Cinema Hall, Performance space. The students will be asked to design an auditorium/theatre on the basis of their studies.</p>
BARC3002: Building Construction-V 33 Hours

Unit I: Cladding and Insulation

Interior cladding/ thermal performance standards, interior insulating assemblies, sound absorbers, reflectors etc.

Unit II: Floor Finishes

Floor finishes: PCC, terrazzo, stone slabs, brick and terracotta tiles, Synthetic materials (PVC, Timber). Floors of industrial buildings & warehouses. Ceramic wall & floor tiles.

**BARC 3003: Building Structures-V
25 Hours**

Unit-IV: Static and Dynamic behavior of structural elements

Shear failure of structures. Behavior of shear force. How the shear resistance of a member varies. Study of bending moment and their effect in various elements of trusses, bending equation, Bending stresses in symmetrical and unsymmetrical sections.

Unit-V Analysis of trusses

Deflection analysis of determinate beams, frames and trusses, Analysis of Indeterminate trusses. Analysis of propped cantilevers, fixed beams and continuous beams, portal frames.

**BARC3004: Theory of Design
06 Hours**

Unit-V: Deconstructivism

Narrative and representational. Sources in Russian Constructivism. Non perfection in the works of Frank Gehry, Peter Eisenman, Bernard Tschumi, Daniel Libeskind, Questioning traditional purity of form, geometry and structure.

**BARC3005: Computer Application in Architecture-V
12 Hours**

Introduction to Rhino

Concept of 3D Designing in architecture, Curve: Drawing and Editing – Tools and Utilities, Dimensioning: Co-ordinate methods / Geometrics
Text: Creating / Editing / Extruding
3D Concept: Concept of View and Visual of 3D object.

Introduction to Parametric Design, Generative modeling, application to product design, architecture, landscape, digital fabrication, creation of physical and digital parametric models using as main tools Grasshopper for Rhino etc.

<p>BARC3006: Building Services-IV 41 Hours</p> <p>Acoustics: <u>Unit I: Acoustical design and treatments</u> Reverberation Time and its importance for acoustical performance of an enclosure, Acoustical defects in an auditorium and their remedies, Acoustical design of auditorium and other acoustically sensitive enclosures meant for speech, music, lecture, etc., Properties of materials and their application for acoustical treatment, shape analysis for different enclosures, Sound Amplification Systems, understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms etc.</p> <p>HVAC: <u>Unit I: Air Conditioning Systems</u> Packaged Air Conditioners, Direct Expansion Air Conditioning Systems, Central or All-water Air Conditioning Systems, Selection criteria, design / structural considerations and energy requirements for mentioned air conditioning systems.</p> <p><u>Unit II: Emerging Trends in HVAC</u> Passive Heating and Cooling Systems, Energy Saving through Design, Operation and Maintenance, Emerging Technologies – VRV, VRF, Heat Recovery Systems, etc</p>
<p>BARC3018: Estimation and Costing 20 Hours</p> <p><u>Unit-I: Introduction to estimation</u> Introduction to Quantity estimation, costing and specifications related to building projects. Definition of estimating and costing, Purpose of estimation and costing, Procedure of estimating or method of estimating, data required to prepare an estimate (Drawings/specification/ rates), complete estimate structure.</p> <p><u>Unit-II: Measurement of materials and works</u> Introduction to measurement of various construction work items, importance and significance in construction projects i.e. Units of measurement, rules for measurement, Methods of taking out quantities- Long wall and short wall method, centre line method, partly centre line, cross wall method. Standard modes of</p>

<p>measurement as per Indian Standards for various work items.</p>
<p>BARC3018: Working drawings 20 Hours</p> <p>Ability to organize building design information in a working drawing format suitable for various purposes related to the execution of the project along with an ability to read building working drawings to extract specific information.</p> <p>Type of Working Drawings: Schematic Drawings, General Arrangement Drawings, Detail Drawings, Drawings for Statutory Approval, Tender Drawings, Good-for-Construction Drawings, Shop Drawings, As-built Drawings, insertion of purpose-specific information for each type of drawing.</p>

Suggested Reading

1. National Building Code, 2015, Bureau of Indian Standards
2. Salvan, George S., Architectural Utilities 3: Lighting & Acoustics
3. Barron, M., Auditorium Acoustics and Architectural Design; Taylor & Francis.
4. Harold, B.M. & Lewis G.F. Acoustics for Architects; Reinhold
5. Structural Design and Drawing & Reinforced Concrete and Steel by N. Krishna Raju
6. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. Chakraborty, M. Estimating, Costing, Specification & Valuation
7. C.P.W.D. Standard Schedule of Rates.
8. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.

Name of The Course	M24: Decor
Course Code	ARMO 3004

Prerequisite	Product Analysis, Universal Design, Language of Architecture, Art and Architecture			
Co-requisite	Building Specification, Estimation and Costing, Theory of Interior Design, Building Acoustic			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To study Interior Design principles and their applications in interiors, foster creative ability and inculcate skills to understand and conceive architectural design.
2. To dissipate practical level skills in the subject to the students along with the theoretical understanding of the same.
3. Interior environment, theme, ambience, material, color, texture and its impact on human psychology and behavior..
4. Performing market surveys, soft furnishing and upholstery, floor finishes etc.

Course Outcomes

CO1	Apply basic concepts of interior design
CO2	Design interior of a restaurant
CO3	Design a commercial kitchen
CO4	Create furniture elements
CO5	Estimate the cost of interiors in a built structure

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3001:	Architectural Design-V	79 Hours
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Introduction to Interior Design-
Definitions related to interior design. Review of enclosing elements like walls, floors, ceilings, openings, staircases, furniture & design elements such as color, light textures in interior spaces. Principles of interior design.

History of Interior & Furniture Design-
Concise understanding of evolution from ancient to modern, post-modern ideologies to contemporary (Egyptian, Greek, Roman, Gothic, Baroque, Renaissance, Arts and Crafts Movement, Art Nouveau, De Stijl, Modernism, Post Modernism and Contemporary).

Study of Materials, Finishes & their applications in Furniture & other Interior Elements-
An in-depth understanding of the characteristics and workability of various materials used in interiors. Their classification could be on basis of elements of usage (floor, ceilings, walls, doors, windows and fabrics/upholstery) or materials based like wood, metal plastics and their variants.

Understanding innovation in Furniture & Interior Design-
Modern materials, Modular furniture, interior landscaping, Fittings & fixtures.

Analysis & Design of Furniture-
Analyzing existing designs of selected furniture on basis of ergonomics, user type, economics, material, joinery and maintenance to ascertain their suitability. Design furniture for specific use complying with the aforementioned formulated design criteria. Build scaled models of the designed furniture for better understanding of working and materials.

Analysis & Design of small Interior spaces-
Analyze small selected interior spaces like study, bedroom, executive/ architect office, retail outlet, conference, reception & waiting lobby including toilets and kitchens in detail, for varied aspects like function, ergonomics, and materials and establishing detailed design criteria. Design of selected small interior spaces on specific sites/ locations based on formulated design criteria using modern design methodologies. Develop design details of the afore-designed projects for their furniture and finishing.

BARC3002:	Building Construction-V	38 Hours
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<p><u>Unit I: Aluminium as building material</u> Introduction to Aluminium as building material, advantage and disadvantages, study of various sections available for doors and windows together with accessories. Aluminium framed doors, windows & partitions types, design and construction details.</p> <p><u>Unit II: Interior Finishes</u> Surface finishes: Preparation of variety of surfaces, Application of various coats, Paints and surface finishes; Composition, properties and methods of application of different types of paints: Oil, synthetic enamels, acrylic and other plastic emulsions and formulations, interior and exterior grade paints. Natural and synthetic clear varnishes, French polish. Cement based paints..</p>
<p>BARC 3018: Estimation and costing 19 Hours</p>
<p><u>Unit-III Types of estimates</u> Preliminary/Approximate Quantity Estimates: Importance & purpose of Preliminary /Approximate estimates, Plinth area method, Cubical contents method and centre line method and their preparation. Types of approximate estimates, basic differences and advantages. Detailed Quantity Estimation: Types of detailed estimates and their application, Methods of deriving detailed quantities for various construction work items. Preparation of Detailed estimate, Work items as per construction stages: Foundations, Superstructure, Finishing works in a simple building. Description & significance of Items in Bill-of-Quantities (BOQ).</p> <p><u>Unit-IV Costing</u> Introduction, meaning, purpose, methods of estimating cost of construction for various work items, cost indices, rates of labour and material, analysis of rates, preparation of abstract of estimated cost, use of CPWD schedule of rates. Deriving construction cost as per BOQ.</p> <p><u>Unit-V Specifications</u> Introduction, Definition, importance and purpose of specifications, impact on costing. Principles and practices. Types of specifications. Knowledge of manufacturers' specifications for construction materials/products. Specification of common building materials including carriage & stacking of materials. Specifications for a simple building. Standard specifications of BIS. General</p>

<p>abbreviations used in specifications. Specification of new building materials..</p>
<p>BARC3005: Computer Application in Architecture-V 02 Hours</p>
<p>Rendering of interior Views on Rhino, Apply materials and textures, work with render settings. Use of plug-ins such as V-Ray with Rhino</p>
<p>BARC3006: Building Services-IV 12 Hours</p>
<p>Acoustics: <u>Unit II: Noise Control</u> External noise source and its control (Traffic, Rain, industry etc.), Source within buildings and its control (Fans, chillers, boilers, HVAC noise sources), air born and structure borne sound transmission, vibration isolation, damping.</p> <p>HVAC: <u>Unit III: Chilled water systems</u> Direct expansion and chilled water systems. Types of compressors air-cooled & water-cooled condensers, introduction to cooling tower air handling unit, fan coil unit, pumps, Hot water generator and chilled/ condenser water piping. Brief introduction to variable air volume water volume and vapor absorption system. Fresh Air, Sick building syndrome, Indoor air quality and importance of fresh air.</p> <p><u>Unit IV: Ventilation Systems</u> Application, Brief introduction to air conditioning system design in hotels, Hospital and commercial buildings. Ventilation Systems, Basement ventilation, Car park ventilation, Toilet/pantry ventilation, Introduction to air-cooling system.</p>

Suggested Reading

1. Ching, F. D. K. (1987). Interior Design Illustrated. New York: V.N.R. Publications.
2. Doshi, S. (Ed.) (1982). The Impulse to adorn - Studies in traditional Indian Architecture. Marg Publications.
3. Kathryn, B. H. and Marcus, G. H. (1993). Landmarks of twentieth Century Design. Abbey Ville Press.

4. Pendero, J. and Zelnik, M. (1979). Human Dimension and Interior space: A Source Book of Design
5. Reference Standards. New York: Whitney Library of Design
6. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. Chakraborty, M. Estimating, Costing, Specification & Valuation
6. C.P.W.D. Standard Schedule of Rates.
7. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.
8. Cox, T. J., and Antonio, P. D. (2009). Acoustic Absorbers and Diffusers. 2nd Ed. Taylor & Francis.
9. Eagan, D. Concepts in Architectural Acoustics.
10. Hopkins, C. (2008). Sound Insulation: Theory into Practice. 1st Ed. Butterworth Heinemann.

Name of The Course	M25: BIM			
Course Code	ARMO 3005			
Prerequisite	Language of Architecture, Render/Origami,			
Co-requisite	Autocad, Working Drawing			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To introduce the fundamentals of Building Information Modelling (BIM).
2. To learn various workflows and procedures of BIM work-environment.
3. To develop basic skills in application of BIM tools and techniques in Architecture.

Course Outcomes

CO1	Create a set of working drawings for previous design project
CO2	Create a project report of Ground+1 brick residence
CO3	Apply basic concepts of Revit Software
CO4	Apply basic concepts of building information modeling software
CO5	Model a DPR in BIM software

Continuous Assessment Pattern

Practical IA			Practical	Total
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	Marks
15	15	20	50	100

Course Content:

BARC3001: Architectural Design-V 11 Hours
Create a BIM project report of previous design project
BARC3005: Computer Application in Architecture-V 19 Hours
<u>Unit-I: Introduction to BIM</u> Introduction to BIM, Concepts & Principles, User-Interface, Viewing the Model, Resources. Understanding terms, elements and properties. Creating a project in BIM environment, creating levels and grids, creating conceptual design.
<u>Unit-II: Basic Modelling</u> Modelling of walls, windows, doors, setting view range, components, columns, roof, ceiling, floors, openings, surfaces, stairs, ramps, railings, curtain elements. Understanding families and working with families, family editor, creating a component, in-place components, reference planes, voids, join/cut geometry. Rooms and areas.
<u>Unit-III: Annotation and Visualization</u> Annotations; grids, dimensions, text, tags, rooms, schedules, sheets, symbols, creating views. Setting of colour schemes, legends, openings. Visualization; rendering, materials, lights, paint tool, decals. Project phasing, detailing and preparing construction documents.
<u>Unit-IV: Site and Solar Studies</u> Site, topo-surface, building pads, divided surface, creating topo-surface from CAD contours, massing studies. Setting up and creating solar studies. Applying and removing constraints.
BARC3018: Working drawings 20 Hours

Enable the students to illustrate and prepare the drawings good for construction explaining the overall building design.

The working drawings shall be based on building design prepared as design studio assignment in the previous module. The learning of building material and construction will be implemented for preparing various drawings through the module.

Preparation of detail floor level plan/s and roof level plan required for the execution of work on the site, detail of Section/s and Elevation/s to depict building heights, projections and floor levels.

Preparation of detail drawings of doors, windows, openings with specifications of materials.

Suggested Reading

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction Quality Assessment System.
2. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
3. Osamu, A. W., Linde, R. M. and Bakhoun, N. R. (2011). The professional practice of architectural working drawings. 4th Ed. Hoboken : John Wiley & Son.

Name of The Course	M26: Prefab			
Course Code	ARMO 3006			
Prerequisite	Universal Design, Pavillion and R.C.C			
Co-requisite	Retrofitting in Buildings, Defects and Remedies in Buildings			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. The aim of this module is to study the present situation of the precast construction industry.
2. To develop and include universal design principles

3. Designing in light weight construction – concrete, pre tensioning, post tensioning.

4. Defects and remedies

Course Outcomes

CO1	Analyze defects and remedies in buildings
CO2	Analyze retrofitting in buildings
CO3	Analyze prefabricated speedy construction in a building
CO4	Apply basic concepts of modular construction
CO5	Appreciate the role of prefab construction in respect of technology, culture, time and environment

Continuous Assessment Pattern

Practical IA			Practical	Total Marks
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	
15	15	20	50	100

Course Content:

BARC3009: Architectural Design-VI 38 Hours
Universal Design- People needs Principles of Universal Design, Universal Design Definition, seven principles: - Equitable Use Flexibility in Use, Simple and Intuitive, Perceptible Information, Tolerance for Error, Low Physical Effort, Size and Space.
BARC3010: Building Construction-VI 12 Hours
Defects in Building Analyze defects in building and understanding the role of advanced construction techniques. Defects in buildings and their remedies.
Prefabrication Systems Open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc.
Pre-Stressed Concrete Introduction, methods of pre-stressing and their application to large-space structures.



Suggested Reading

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction Quality Assessment System.
2. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
3. Barry, R (1986) Construction of Buildings, London, vol. 1 to 5.
4. McKay, W. B. (1972) Building Construction (Metric), Longman, London, vol. 1 to 5.
5. National Building Code of India.

Name of The Course	M27: Tall Buildings			
Course Code	ARMO 3007			
Prerequisite	R.C.C, Sciography, Steel and Facade			
Co-requisite	Human values, Theory of Design and Building structures			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To design tall building core, earthquake resistant structures, structural grids- diagrid, tensegrity, fire proofing, historic evolution of tall buildings, contemporary mega structures.
2. To Analysis building on the basis of earthquake and dynamic loads.
3. To develop basic skills in application of BIM tools and techniques in Architecture.

Course Outcomes

CO1	Design core of a tall building
CO2	Analyze structural system of a tall building

CO3	Illustrate evolution of mega structures
CO4	Analyze building on the basis of earthquake and dynamic loads
CO5	Appreciate the role of services in tall building design

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3009: Architectural Design-VI 25 Hours
Documentaries of Mega structures for analysis of high rise structures. Understanding structural grids, form geometry.
BARC3010: Building Construction-VI 07 Hours
Industrial Construction Structural Steel Works.
BARC3012: Human Values 13 Hours
Course Introduction- Need, Basic Guidelines, Content and Process for Value Education
1. Understanding the need, basic guidelines, content and process for Value Education.
2. Self Exploration–what is it? - its content and process; ‘Natural Acceptance’ and
3. Experiential Validation- as the mechanism for self exploration
4. Continuous Happiness and Prosperity- A look at basic Human Aspirations.
5. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority.
6. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.
7. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.
2. Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha.
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).
4. Understanding the characteristics and activities of 'I' and harmony in 'I'.
5. Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail.

Understanding Harmony in the Family and Society

1. Understanding Harmony in the family – the basic unit of human interaction.
2. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals.
3. Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family!

**BARC3011: Building Structure-VI
05 Hours**

Introduction to high-rise buildings and structural systems

Height analysis, plan shapes, grids and core design - Foundations and soil conditions - Construction sequencing, building skin and envelope - Design philosophy, structural loading, sequential loading, materials, high performance concrete – Fiber reinforced concrete, High strength concrete, Light weight.

Prerequisite	Context, Sciography, Sociology, BIM, R.C.C, Tall Buildings			
Co-requisite	Building Services, Disaster management, Building Bye-laws			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. Including building services and structural system
2. Area calculation, building byelaws, FAR/FSI, Height restrictions, covered area.
3. To develop basic skills in application of BIM tools and techniques in Architecture.

Course Outcomes

CO1	Apply basic theory of design
CO2	Analyze advance structural concepts
CO3	Analyze advance services concepts- (automation)
CO4	Illustrate basic concept of neighborhood and master plans
CO5	Design vertical housing

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Suggested Reading

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore : The BCA Construction Quality Assessment System.
2. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
3. "Time Saver Standards for Building Types", John Hancock Callender, Joseph De Chiara, McGraw-Hill, New York.

Course Content:

**BARC3009: Architectural Design-VI
88 Hours**

Design of a medium to high-rise building in a dense urban setting: The problem should attempt to bring out a comprehension of the framework that outlines a building interior, the structural system and the services core, and the relation of this interior with the exterior environment through the building skin. The project should be of high services complexity with mechanical systems for space conditioning, parking and other services,

Name of The Course	M28: Neighbourhood
Course Code	ARMO 3007

and include the integration of active energy systems.		
BARC3011:	Building	Structure-VI
15 Hours		
Behavior of various structural systems		
Factors affecting growth, height and structural form – High rise behavior, rigid frames, braced forms, in filled frames, shear walls, coupled shear walls, wall frames, tubular, cores, outrigger-braced and hybrid mega systems.		
Disaster resistant structures		
Overall buckling analysis of frames, wall frames – Torsional instability, out of plumb effects, stiffness of member in stability, effect of foundation rotation. Case study of a high-rise structure with 3D model analysis. Concrete - Loading and movement Gravity Loading, Dead and Live load - Methods of Live Load Reduction – impact, gravity loading, construction loads, wind loading – Static and dynamic approach Tensile structures in high-rise.		
BARC3015:	Building	Economics
12 Hours		
Elementary concepts of economics		
Introduction to economics- Definitions, Needs & Wants, Nature & Scope of Economics. Division of economics – Micro Economics - Scarcity, Utility - Marginal, Total & Average. Laws of Demand and Supply. Macro Economics - Economic system in India.		
Economics in relation to architecture, engineering and other sciences		
Meaning and scope of building economics, Issues and challenges associated with building projects. Building Efficiency, Building Life-cycle. Costs and Benefits of Building - Monetary and Non Monetary.		
BARC3012:	Human	Values
12 Hours		
Harmony in Human-Human Relationship		
1. Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; 2. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship 3. Understanding the meaning of Vishwas; Difference between intention and competence		

4. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.
Understanding Harmony in the Nature and Existence - Whole existence as Co-existence
1. Understanding the harmony in the Nature 2. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature. 3. Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. 4. Holistic perception of harmony at all levels of existence
Implications of the above Holistic Understanding of Harmony on Professional Ethics
1. Natural acceptance of human values 2. Definitiveness of Ethical Human Conduct 3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order 4. Competence in professional ethics: 5. Ability to utilize the professional competence for augmenting universal human order. 6. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems. 7. Ability to identify and develop appropriate technologies and management patterns for above production systems. 8. Case studies of typical holistic technologies, management models and production systems 9. Strategy for transition from the present state to Universal Human Order: 10. At the level of individual: as socially and ecologically responsible engineers, technologists and managers 11. At the level of society: as mutually enriching institutions and organizations.
BARC3013: Computer Application in Architecture-VI
10 Hours
Introduction to 3D studio Max
Max user interface / Modeling / Applying Materials to geometry / Creating lights / Photo realistic Rendering / Simple Animations / Exporting files from Auto CAD to 3D studio Max.
Introduction to Rhino.

BARC3020: Landscape Architecture 13 Hours
Introduction to Landscape Architecture Introduction to major and minor landscape elements, natural and man-made elements. Land – as heritage, as resource, Land use implications. Water – Planning approach, as Resource, as Feature, Water related site design, Plants – in nature, Introduced plantations, Planned & planted landscape.
Structures Composition, Structures in landscape, Defined open space. Habitations – Dwelling-nature relationships, Human needs & habitat. Community – The group imperative, Form order, New directions ^[1] City – Cityscape, Possibilities, New urbanity.

Suggested Reading

1. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
2. Landscape Architecture - A Manual of Site Planning & Design - John O.Simonds, McGraw Hill Book Co., New York, 1983.
3. Motloch, J.L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.
4. Kassler, E.B., "Modern Gardens and the Landscape", Museum of Modern Art, New York, 1984.
5. Landphair H. C., "Landscape Architecture Construction", Elsevier, 1979.
6. Rhino NURBS 3D Modeling by McNeel& Associates, New Riders; Pap/Cdr edition (Aug 1999) Learning to use Rhino - Tutorials Collection – web
7. Reference:<https://www.rhino3d.com/learn> Mastering Autodesk 3ds Max 2013, by Jeffrey Harper, Sybex; First edition (Sept 2012)
8. Junnarkar, S. B. (1991). Mechanics of Structures. Vol. 1. 21st Ed. Delhi : Charotar.

Name of The Course	M29: Agora			
Course Code	ARMO 3009			
Prerequisite	Pavilion, Context, Sociology and Neighbourhood			
Co-requisite	Site Plan, Landscape Architecture, Rain water Harvesting, Building Economics			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To familiarize students with problem of a complex building involving a high level of services and advanced structural systems.
2. To study and analysis of a live site for site services and site planning.
3. Planning and designing of a campus.

Course Outcomes

CO1	Analyse theory of design
CO2	Analyse basic concepts of waste management
CO3	Design a landscaped central court of vertical housing
CO4	Write a dissertation
CO5	Design a shopping mall

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC3009: Architectural Design-VI 100 Hours
Problem of a complex building involving a high level of services and advanced structural systems eg. Sports complex, institutional campus. Exercises in simulation and conceptual modeling shall be conducted. The studio will also focus on sustainable design principles, including waste recycling, rain water

Harvesting, site planning principles and landscaping.
BARC3010: Building Construction-VI 12 Hours
Portal Frame Construction. Construction details for tall buildings.
BARC3014: Building Economics 13 Hours
Project Financing Equity, Financing Institutions in Financing Process, Interim Finance and Permanent Financing, Bank Loan - Simple Interest and Compound Interest. Types of Mortgage, Lease Arrangements.
Economic Performance of Building Decision Making using techniques of economic performance to measure tangible and non-tangible issues - Cost-Benefit Analysis, Incremental Analysis and Multi-criteria Analysis.
BARC9997: Research/Dissertation 06 Hours
Introduction Aspects of Analysis of an Architectural project.
BARC3013: Computer Application in Architecture-VI 06 Hours
Rhino Precision Modelling/ Draw with absolute, relative rectangular, and polar co-ordinates/ Distance and angle constraints / Viewports and construction planes / Model in 3-D space/ Elevator mode/ Rectangle command and its options.
BARC3020: Landscape Architecture 13 Hours
Landscape design: Visual arts as ordering mechanism, Circulation as ordering mechanism, Spatial development, Architecture & site development.
Study of modern gardens & landscapes: Modification of site topography, Grading & drainage.
Japanese gardens: History, development, features, elements and types of Japanese gardens.
Mughal gardens: History, influences, typical features and elements of Mughal gardens.

Suggested Reading

1. Joe, B. (Ed). (2002). Details in Architecture: Vol. I-V. Victoria : The Images Publishing group.
2. Landscape Architecture - A Manual of Site Planning & Design - John O.Simonds, McGraw Hill Book Co., New York, 1983.
3. Motloch, J.L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.
4. Kassler, E.B., "Modern Gardens and the Landscape", Museum of Modern Art, New York, 1984.
5. Bring, M, "Japanese Gardens: Design & Meaning", McGraw Hill Book Co., New York, 1981.

Name of The Course	M30: Management			
Course Code	ARMO 3010			
Prerequisite	Décor, Pavilion			
Co-requisite	Building specification, Working Drawing			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To familiarize students with building specification and estimation and costing of a building.
2. To deal with Critical Appreciation of a Project Analysing on the basis of site, Built Form and Space, Spatial Organization, Materials and Techniques, Elements and special Characteristics, Activity Pattern

Course Outcomes

CO1	Analyze building specifications
CO2	Analyze building estimation and costing
CO3	Appreciate the role of economics in built environment
CO4	Apply building byelaws to their design
CO5	Make a detail working drawing of shopping mall

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

<p>BARC3010: Building Construction-VI 17 Hours</p> <p>Lightweight constructions Hollow bricks, slabs, and party wall and shell roofs.</p> <p>Speedy Construction Methods Types of floor construction - Beam & Slab, Waffle Grid Slab, Drop Beam & Slab, Flush Slab, Lift Slab Construction; Cast-in-situ service & stair cores; Cross wall & Box frame construction.</p>
<p>BARC3011: Building Structure-VI 05 Hours</p> <p>Earth quake loading – Equivalent lateral force, model analysis, combinations of loading – Working stress design, limit state design, plastic design - Codes & Standards.</p>
<p>BARC9997: Research/Dissertation-I 19 Hours</p> <p>Technical Writing and Critical Appreciation of a Project: Analyzing on the basis of site, Built Form and Space, Spatial Organization, Materials and Techniques, Elements and special Characteristics, Activity Pattern.</p> <p>Book Reviews Review of Book with presentation of the précis</p>
<p>BARC3013: Computer Application in Architecture-VI 09 Hours</p> <p>Rhino Point selection with object snaps / Analysis commands: length, distance, angle, radius / Draw circles and arcs/ Draw ellipses and polygon curves / Rhino render and render colour/ Model free-form curves/ Create helix and spiral curves.</p>

1. Building and Construction Authority. (2005). CONQUAS-21. Singapore: The BCA Construction Quality Assessment System.
2. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. Chakraborty, M. Estimating, Costing, Specification & Valuation
3. C.P.W.D. Standard Schedule of Rates.
4. Dutta, B. N. (1998). Estimating and Costing in Civil Engineering. 24th Ed. UBS Publishers Distributors Ltd.
5. Birdie, G. S. (2005). Text Book of Estimating and Costing. Dhanpat Rai Publishing. Chakraborty, M. Estimating, Costing, Specification & Valuation.

Suggested Reading

Name of The Course	M31 Resurgence			
Course Code	ARMO 4001			
Prerequisite	Basic knowledge of Town Planning and Transportation pattern			
Co-requisite				
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To study the various defects and remedies in a building.
2. To learn philosophies and basic components of town planning.
3. To appreciate the process of research and make the students aware of its potential in the field of architecture.

Course Outcomes

CO1	Apply basic concepts of town planning.
CO2	Evaluate the level of planning of a town plan.
CO3	Protect the environment, improve public health and safety, and increase the wealth of any location.
CO4	Value the role of sustainability in built environment
CO5	To write a dissertation on current scenario of any particular area.

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC4002 Building Construction-VII 08 Hours
The study of various defects in buildings and their remedies, Defects caused by dampness, applied forces and changes in size.
BARC4013 Town Planning 10 Hours

Introduction to Town Planning:
Definitions of town planning, form of planning, Elements and planning principal of city plan, Shapes of plan in accordance to road networks, Town planning in ancient India.

Roads and Traffic Studies
Awareness of concepts related to various traffic problems in India, Urban road systems and geometry. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines.

Planning Concepts and Evolution:
Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broad acre), Garden city (Letch worth), Radburn Theory (Radburn) and Neighborhood planning.

Pioneers of modern town planning:
Patrick Geddes, Le Corbusier, Edward Lutyens, Norman Foster, Kevin Lynch, Clarence Perry, Frank Lloyd Wright, Ebenezer Howard.

Planning Process & Standards:
Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.

BARC9998 Research/ Dissertation
 12 Hours

UNIT – I
 • Research in architecture – its nature, purpose and scope.
 • Basic and applied research.
 • Technical and behavioral – oriented research.

UNIT – II
 Science and scientific method – various steps in scientific method: hypothesis, research design, data collection & analysis, conclusion and implications with special reference to architectural research

Suggested Reading

1. Image of the city , Kevin lynch
2. Town planning, Rangwala
3. Pattern Language, Christopher Alexander

4. Architecture research methods, david wang

5. The Dessertation- Guide for student of Architecture, Lain Borden

Name of The Course	M32: Ocular			
Course Code	ARMO 4002			
Prerequisite	The student is expected to know about the various stages of Product analysis , designing, photography taught in first year Basic understanding Design Principles and function			
Co-requisite				
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1.To learn the basic concepts of Designing and analysing any design or Product

2. To develop skills of designing any product or Design in context of function and aesthetic both

Course Outcomes

CO1	Apply basic concept of the elective topic
CO2	Appreciate the role of Elective topic in global scenario
CO3	Internalize the values of the topic
CO4	Conduct the surveys on the topic given
CO5	Present the researched topic in an seminar

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

BARC4009Product Design*1 (Elective I-A) 30 hours
<ul style="list-style-type: none"> Design Definitions and Design Spectrum

- **Product Attributes – Function and Emotion**
- **Product configurations and Component relationships (component Matrix)**
- **Introduction to Design Research**
- **Product Analysis – Diachronic, Synchronic**
- **Understanding and Analyzing contexts, parallel situations, future situations**
- **Understanding modularity and modular systems – 3D lattice and structures**
- **Design of Modular System – abstract design**
- **Process of conception and its documentation**
- Seminar and exercises related to above topics

Suggested Reading

1. Thinking fast and slow, Daniel Kahneman
2. Don't make me think, Steve Krug
3. The Magical Garden of Claude Monet (Anholt's Artists)
4. A Splash of Red: The Life and Art of Horace Pippin (Hardcover)

OR

BARC4010 Art Appreciation*1 30 hours
<p>Unit-I. Introduction- Defining the disciplinary differences: Introduction to various types of Art, Concept of beauty and Aesthetics. Evolution of art and design.</p> <p>Unit-II. Art and Design- A historical perspective: History of Art. Art through ages. Importance of Visual perception, Design elements from nature.</p> <p>Unit-III. Expression of Art and Design: Relationship between Art and Design with man, space and environment. Concept of space.</p>

Articulation of form, sense of enclosure, Organization of spaces.

Unit-IV. Introduction to theories:

Golden proportion, Theories of scale and proportion, Vitruvian theory, Modular man, principles of Design and elements of Architecture.

Unit-V, Relations in Art, Design and Architecture: **Factors influencing the process of Art, Design and Architecture. Form and function. Review of selected examples.**

Suggested Reading

1. **The Magical Garden of Claude Monet (Anholt's Artists)**
2. Katie meets the Impressionist, James myhew
3. Spalsh of Red : The life and Art of Horrace Pippin

OR

BARC4014 Interior Design*1
30 hours

Unit-I. Introduction to Interior Architectural Design:

Definition of interior design, Interior architectural design process, vocabulary of design in terms of principles and elements, Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.

Unit-II. History of Interior Architectural Design: **Brief study of the history of interior architectural design through the ages relating to historical context, design movements and ideas etc. Brief study of folk arts and crafts. (Vernacular design in India) with reference to interior design and decoration.**

Unit-III. Elements of Interior Architecture: **Enclosing Elements Introduction to various elements of interiors like floors, ceilings, walls,**

staircases, openings, interior service elements, incidental elements etc., and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

Unit-IV. Elements of Interior Architecture:

Lighting accessories & interior landscaping Study of interior lighting, different types of lighting their effects types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors, paintings, objects-de-art, etc. Interior landscaping, elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

Unit-V. Elements of Interior Architecture:

Space Programming Study of the relationship between furniture and spaces, human movements & furniture design as related to human comfort. Function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas. Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. Design Projects on Residential, Commercial and Office Interiors.

Suggested Reading

1. **Time saver standards for interior design and space planning**
2. **Interior Graphic and Design Standards, S. C. Reznikof**
3. **Interior Design: Dream Design on a Shoestring - A Guide to Feng Shu**
4. **Indian interiors, Sunil sethi**

OR

BARC4015 Photography*1
30 hours

UNIT – I

- Introduction to photography, early experiments in photography
- brief history of camera, Principle of photography, Types of cameras,
- Basics of motion picture photography.

UNIT – II

- Lens: Characteristics of lens: Focal length, Focus, Iris
- Depth of field, Shutter speed.
- Types of lens: Zoom Lens, Prime Lens, Narrow Angle Lens.
- Wide Angle Lens, Normal lens.

UNIT - III

- Importance of lighting in photography and videographer.
- Properties of light, how light travels, colour source.
- Basic lighting techniques, three point lighting, key light, fill light.
- Back light and background light.
- Lighting instruments : Flood light, Spot light

UNIT - IV

- Picture composition, framing effective shots.
- The shot, scenes, sequences, types of shots.
- Shots based camera's distance from subject.
- Camera angle and camera movement.
- File formats, Types of Digital Storage – Raw image file, JPEG, TIFF, PNG, Targa, EPS.
- Compressing & color correcting.
- Introduction to photo editing software Photoshop and Light room.
- Basic tools in Photoshop Lasso, Pen, Crop, Clone, Layers, Filters.

UNIT - V

- Product photography – Consumables, Durables, Food, Cosmetics

- Portrait photography
- Landscape photography – Seasons, time: twilight, noon, dusk; silhouette
- Composition Normal, Wide Tele
- Nature Photography - Landscape, Wide, Close up
- Action Photography - Pan, Freeze frame
- Indoor Photography - Portrait, Single, Group, Still life

Suggested Reading

1. Architecture photography ,Adrian schulz

OR

<p>BARC4016 Architectural Facade 30 hours</p>
<p>Unit 1 Façade introduction, façade types, history, evolution</p>
<p>Unit 2 Architectural needs, Functions, concepts, Design.</p>
<p>Unit 3 Contemporary façades, façade materials, material fixing details.</p>
<p>Unit 4. Material fixing details. Wall sections, sectional detail, Seminar and exercises related to above topics</p>

Suggested Reading

1. Facades: Design, Construction & Technology, Lara Menzel
2. Exterior building Enclosure, Keith
3. Sustainable Facades: Design Methods for High-Performance Building Envelopes
4. Façades: A Visual Compendium of Modern Architectural Styles Oscar Riera Ojeda

OR

<p>BARC4017 Visual Communication*1 30 hours</p> <p>Unit-I. Learning Sketching, Drawing, and visual thinking: Free-hand drawing appropriate to visual & architectural representation, indoor & outdoor sketching, drawing from observation, terminology & abbreviations used in visual representation, Sheet layouts, line & shape, tone & texture, figure & ground, Color & value, lettering & art lettering, dimensioning, shading, symbols & scale.</p> <p>Unit-II. Design principles and representation techniques: Representation techniques focusing on rhythm, harmony, character, balance, emphasis, ideograms, Interpretation of scale and proportion.</p> <p>Unit-III. Understanding the complexity of forms: Metaphor in visual representation through natural objects, understanding complexity of forms using graphics and models.</p> <p>Unit-IV. Geometric Drawings and Projections: Construction of lines, angles, Constructions of planes- circles, tangent, curves, conic, sections and regular polygons. Introductions to projections, methods of orthographic projections - Points, lines, planes and solids.</p> <p>Unit-V. Section of solids and development of surfaces: Section of solids such as prisms, pyramids, cylinders, cones and spheres etc., Development of surfaces of solids, Intersection of surfaces.</p>
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Suggested Reading

1. **Visual Design: Ninety-five Things You Need to Know. Told in Helvetica and Dingba.**
2. **Essentials of Visual Communication**

Name of The Course	M33: Hospitality			
Course Code	ARMO 4003			
Prerequisite	Understanding of Hotels and Haat Design Student must know about basics of core design.			
Co-requisite	Landscape design			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. **To Design hotel / Haat**
2. **To Design Landscape of Hotel / Haat design**
3. **To Understand the designing Principles of Hotel/ Haat**

Course Outcomes

CO1	Design a hotel with convention center / Hospital
CO2	Apply basic concepts of service floor / hospital information system and safety in built environment.
CO3	Design indoor recreational facilities / Design healing landscapes
CO4	Application of waste management techniques in hotel / Internalize the values of hygiene and social care
CO5	Make a detail working drawing of service floor / Illustrate low cost constructional techniques

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content:

<p>BARC4001 Architectural Design-VII 60 Hours</p> <ul style="list-style-type: none"> • Architectural and composite structural system and services. • Modern technology and materials, • Non-conventional technologies,
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- Energy efficient exterior and interior design.
- Building Services, Site Services

Machinery, Advanced Building Technology

- Introduction of pre-stressing, prefabrication & systems building.
- Jointing, tolerances and modular co-ordination.
- Mass production, transportation, storage and handling of materials.
- Characteristics, performance and application of mechanized construction equipment.

Advanced vernacular construction techniques

BARC4005 Project Management
4 Hours

UNIT I

- Aim, objectives and functions of Construction Management.
- Construction stages, Construction team
- Role of an architect in construction management.
- Management techniques and tools.

BARC9998 Research/dissertation
16 Hours

UNIT – III

- Methods of conducting research.
- Selection of topics and its relevance.
- Identification and formulation of problem.
- Compiling and analyzing existing research database.
- Research design, research instruments and analysis.
- Presentation of results.
- Evaluation of findings, conclusions and recommendations.
- Techniques of research – report writing.

Suggested Reading

1. Welcome to Hotel Architecture , by Roger Connah
2. Neufert’s Architects data.
3. The Fundamentals of Landscape Architecture, Bloomsbury.

BARC4002 Building Construction-VII
20 Hours

4. Design with nature, Ian Mcharg

Name of The Course	M34: Health Care			
Course Code	ARMO 4004			
Prerequisite	Basic knowledge of Hospital Functions			
Co-requisite	Landscape , Fire fighting services			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To Design hospital
2. To Develop understanding of Hospital design Complexities
3. To Design services of Hospital
4. to Develop Working drawing of Hospital

Course Outcomes

CO1	Design a hotel with convention center / Hospital
CO2	Apply basic concepts of service floor / hospital information system and safety in built environment.
CO3	Design indoor recreational facilities / Design healing landscapes
CO4	Application of waste management techniques in hotel / Internalize the values of hygiene and social care
CO5	Make a detail working drawing of service floor / Illustrate low cost constructional techniques

Continuous Assessment Pattern

Practical IA			Practical	Total
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	Marks
15	15	20	50	100

Course Content:

BARC4001 Architectural Design-VII
80 Hours

- Preparation of architectural drawings and details of a large project.
- Preparation of electrical drawings, water supply and sanitary drawings, structural drawings of a small project.
- Specifications of building materials and simple construction as separate document or annotated on the working drawings.

- UNIT II**
- Bar charts and limitations of bar charts.
 - Program Evaluation and Review Techniques (PERT)
 - Critical Path Method (CPM) for project management
 - Development and analysis of CPM network
 - Cost time analysis in network planning
 - Scientific methods of construction management

- UNIT III**
- Project management for repetitive types of buildings. Line of balance method – its working knowledge with exercises.
 - Resources scheduling methods through Bar charts, CPM and Line of Balance method.
 - Inspection and quality control.
 - Safety in Construction.

Suggested Reading

1. Design details for health, Debra D. Harris
2. Modern Trends in Planning And Designing Of Hospitals
3. Step by step Hospital Planning and design
4. Hospital and Healthcare, Richard miller
5. Notes on Hospitals, Florence nightingale

BARC4005Project Management
20 Hours

Name of The Course	M35:Perception			
Course Code	ARMO 4005			
Prerequisite	Basic knowledge of academic Writing and Report writing			
Co-requisite	Architecture and social issues			
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To Develop Project Report
2. To Develop Research paper

Course Outcomes

CO1	Apply basic concept of the elective topic
CO2	Appreciate the role of Elective topic in global scenario
CO3	Internalize the values of the elective topic
CO4	Conduct the surveys related to elective topic
CO5	Present research work through seminar

Continuous Assessment Pattern

Practical IA			Practical	Total Marks
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	
15	15	20	50	100

Course Content:

BARC4011 Low Cost Architecture (Elective II-A)
30 Hours

UNIT- I

- An introduction to the subject to understand the various building techniques adopted in different climatic zones of the country, which resulting in varied vernacular expressions.

- Use of cost effective technologies through the use of local materials, up gradation of traditional technologies, prefabrication etc.

UNIT- II

- Need for low cost construction, both in the rural and the urban sectors.
- Innovations of building techniques for low cost construction.
- Analysis of space norms for low cost buildings.

UNIT -III

- Study of usages pattern of low cost buildings by the habitants.
- Comparative analysis of building materials and costing.
- Works of Laurie Baker, Hassan Fathy and other prominent architects.

Suggested Reading

1. **Building Systems for Low Income Housing”, Ashok Kumar Jain; Management Publishing House, 1992**
2. **“Low Cost Housing in Developing Countries”, Guru Charan Mathur; For Centre for Science & Technology of the Non-Aligned and Other Developing Countries, Oxford & IBH Publishing Company, 1993**
3. **Exploration of Architectural Journalism in India, Pappal suneja**
4. **Low cost architecture , Joseph minguet**

OR

BARC4012 Architectural Journalism (Elective II-A)
30 Hours

Unit I - Introduction to Architectural Journalism

- **What is Journalism and its importance?? Relation between Architectural Journalism. Reading contemporary and historical writings by Journalists and critics, study their approaches.**

Unit II- Introduction to Architectural writing

- **Writing on different articles, on buildings and social issues**
- **Reports on building under construction**
- **Learn how to gather info and do research for stories**

Unit III- Structure of Architectural Journalism and Photo Journalism

- **Learning of documentation of collected info, content writing, formatting, Page composition.**
- **Learning the technique of how the photographs are supporting the write-ups about built environment, to help them understand the expression of pictorial, verbal and visual relationship of architecture journalism.**

Unit IV- The Built Environment &How We Live Today?

- **Looking at and explaining a building in today’s scenario.**
- **What’s happening now and what should be the future.**
- **Read article and write an essay on recent projects.**
- **Writing about the new technologies in today’s architecture and new construction techniques.**

Suggested Reading

1. **Dave Sounders, Professional Advertising Photography, Merchurst, London 1988**
2. **Roger Hicks, Practical photography, Cassell, London 1996**
3. **Julian Calder and john Garrett, The 35mm Photographer’s Handbook, Pan Books, London 1999**
4. **Julie Adair King, Digital Photography for Dummies, COMDEX, New Delhi 1998**
5. **Architecture and the Journalism of Ideas by Bender, Thomas**
6. **Architectural Criticism and Journalism by Mohammad al-Asad w/ Majd Musa**

OR

BARC4018 Conservation (Elective II-C)
30 Hours

UNIT I

- **Interactive session of History of heritage Buildings and cities.**
- **Introduction to conservation of Historic Buildings.**
- **Concepts and approach's to conservation in India and other countries.**

UNIT II

- **Institutional Aspects of Conservation**
- **Conservation related Charters**
- **World Heritage legislation and Sites**
- **Conservation Acts & Legislation**
- **Archaeological Acts**

UNIT III

- **Conservation Area practice, adaptive reuse, up gradation programs in old areas, infill design.**
- **Conservation of traditional water systems.**
- **Upgrading infrastructure, financing and implementation framework for redevelopment and revitalization projects.**

Suggested Reading

1. **Architecture in Conservation: Managing Development at Historic Sites (Heritage: Care Preservation-Management) –James Strike**
2. **Protection, Conservation and Preservation of Indian Monuments-Shanti Lal Nagar**
3. **Architectural and urban conservation-Santosh Ghosh, Ranajit Gupta, Sumita Gupta**
4. **History of Architectural Conservation-Jukka Jokilehto**

OR

BARC4019 Architectural Pedagogy (Elective II-D)
30 Hours

UNIT I- Introduction To Architectural Pedagogy

- **Understanding Pedagogy, Importance of Pedagogy, Role of Pedagogy in Architecture.**
- **Nature of Interaction between teacher and students, Level of participation / involvement of both Educators and Students in various subjects /experiences. The routines of students and educators. The rules that govern the relationship between students and teachers.**

UNIT II- Instructional Methods and Techniques

- **Instructional Methods - Lecture method, Demonstration method, Case Study method, Project method, Programmed Instruction/ Learning, Studio method.**
- **Instructional Media - Meaning, Need and importance, Projected media, Nonprojected media, Computer Based multimedia.**

UNIT III- Field Studies in Architecture

- **Learning of various aspects of architecture through site visits. Understanding the methods of learning, observing and experiencing these aspects. Preparation of report of the particular case study.**

UNIT IV- Hands – on – Studios as a Tool for Learning

- **Development of exercises for various subjects in Architectural Studios.**
- Learning about programme making for the various studios and workshops.

Suggested Reading

1. **Transformative Pedagogy in Architecture and Urbanism by Ashraf M. Salama.**
2. **Art, Architecture, Pedagogy Experiments in Learning by Ken Ehrlich**

OR

BARC4019Futuristic Architecture (Elective II-E) 30 Hours
<p>UNIT I</p> <ul style="list-style-type: none"> concepts envisioned by earlier theorists and architects like Antonio Saint Elia and F.L.Wright <p>UNIT II</p> <ul style="list-style-type: none"> architectural paradigms such as programme generated architecture, dynamic architectural systems, virtuality, Trans architecture, data driven structures and ‘glocal’ approach through the study of relevant projects. <p>UNIT III</p> <ul style="list-style-type: none"> Evolution of contemporary architectural concepts-historical revival biomimicry adaptive reuse and low cost buildings; Futuristic building materials: Buildings; Futuristic building materials: Building tectonics and systems. <p>UNIT IV</p> <ul style="list-style-type: none"> Study of specific building types-houses, office spaces, public buildings, skyscrapers and transportation hubs through various projects. <p>UNIT V</p> <ul style="list-style-type: none"> Sustainable buildings including energy efficiency, Zero Energy and Energy Plus buildings and resource conservation.

3. **Building a New Milleneum- Jodidio, P, Vol.1, Taschen**
4. **Architecture Now- Jodidio, P.Vol. 2, Taschen**

Name of The Course	M36: Professional Training			
Course Code				
Prerequisite	Knowledge of Architecture and drawings			
Co-requisite	Architecture softwares			
Anti-requisite				
	L	T	P	C

Course Objectives

1. Student will be able to do Architecture drawings
2. Student will be able to do GFC’s and Woking drawings
3. Student should able to handle site.

Course Outcomes

CO1	Test the theories taught
CO2	Appraise the relation between the site work and drawings
CO3	Inculcate teamwork
CO4	Devise a procedure for accomplishing a task
CO5	Display self-reliance, work ethics in an office

Continuous Assessment Pattern

Practical IA	Practical VIVA 4 (ETE)	Total Marks
50	50	100

Course Content:

<p>BARC4008 Professional Training</p> <p>Nature of work during Professional Training:</p> <p>The main objective of the ‘Practical Training’ is to enable the students to gain range of practical experience to make themselves enable for professional field. The architects may expose the trainee to difference aspects of professional practice during training period. Following task may include:</p>
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Suggested Reading

1. 21st Century House- Bell ,J, Laurence King Publishing
2. Materials for Architectural Design- Bell, Victoria Ballard, Laurence King Publishing

- Preparation of Sketches of project to understand the design with respect to context, need and site, along with the sketches of constructional details.
- Preparation of measured and survey drawings and site visits
- Preparation of presentation drawings.
- Preparation of submission drawings for various municipal authorities.
- Preparation of working drawings of projects.
- Preparation of Bill of Quantity and estimate.
- Preparation of lists of detailed specifications
- Discussion with Clients and various consultants like Structure and other building services consultants.
- Office management.

- Study of usages pattern of low cost buildings by the habitants.
- Comparative analysis of building materials and costing.
- Works of Laurie Baker, Hassan Fathy and other prominent architects.

Training Portfolio

After completion of practical training, the trainee is required to submit the following in a hard copy. Training report should contain the following:

1. Documents and Drawings
 - Joining report at the time of joining
 - Office profile
 - Monthly Log sheet with work information (Also submit every end of the fourth week) includes listing of current project being undertaken.
 - Project wise details of work undertaken by student
 - Student/Trainee's Assessment Report duly signed with architect.

- Student's own assessment and experience about office, working, projects etc.

All projects listed in the report should compulsorily correspond with the list of projects mentioned in the monthly log sheets. Copies of drawing shall be attached as annex to support the content of the report. The drawing prints shall be obtained with the permission of the office and stamped/sealed by the 'Supervisor'/Head of the firm/office.

2. Critical appraisal of a building of national/International importance-1

The trainee is required to write a report choosing any building that has been designed/ executed by the company/ firm, she / he is working for internship. This can be done through secondary research/data collection.

The report should contain:

- Explanation/ Justification for the choice of the project/ built structure
- Fact file of the project- discussion on location, client profile, context (physical, cultural) and legal bindings.
- Remarkable features that make the building / complex noteworthy/ award winning/ popular.
- User experience and the design comparison.
- Student's/Trainee's own assessment and experience about the same.
- Secondary research/data sources used.

3. Critical appraisal of a building of national/International importance-2

The trainee is required to write a report choosing any building that is present in the city/ town where she / he is working for internship. This needs to be done with primary study and user experience study. This allows the student to choose structure of heritage values.

The report should contain:

- Explanation/ Justification for the choice of the project/ built structure

- **Fact file of the project- discussion on location, client profile, context (physical, cultural) and legal bindings.**
- **Remarkable features that make the building / complex noteworthy/ award winning/ popular.**
- **User experience and the design comparison.**
- **Student's/Trainee's own assessment and experience about the same.**
- **Secondary research/data sources used.**

6. To familiarize students the role of energy in built environment and for the efficient use of energy in design process.

Course Outcomes

CO1	Apply basic concepts of the Sustainable Cities & Energy Compliance
CO2	Appreciate the role of Sustainable Cities & Energy Compliance in global scenario
CO3	Internalize the values of the Sustainable Cities & Energy Compliance
CO4	Conduct the surveys related to the Sustainable Cities & Energy Compliance
CO5	Present research work through seminar

Name of The Course	M37-AMENABLE
Course Code	ARMO 5001
Prerequisite	The student is expected to know about the various impacts of development projects on environment and the mitigating measures Basic understanding of elementary seismology and behaviour of buildings during earthquakes
Co-requisite	
Anti-requisite	
	L T P C
	50 2

Continuous Assessment Pattern

Practical IA			Practical	Total Marks
VIVA 1	VIVA 2	VIVA 3	VIVA 4 (ETE)	
15	15	20	50	100

Course Objectives

1. To understand the basic concepts of the Sustainable Cities & Energy Compliance
2. To understand the process of framing surveys related to the Sustainable Cities & Energy Compliance
3. To manage students for presenting research work based on different seminar related to Sustainable Cities
4. To understand to inter relationship between People with Environment and Buildings
5. To provide knowledge on the underlying concepts of intelligent buildings

Course Content: Disaster Mitigation and Management

Unit I: Introduction to Hazards & Disasters
Introduction to disaster management, Indian scenario, Understanding of disaster, Hazard and its classification, Vulnerability, Capacity, Risk. Various types of disasters. To understand in detail for the causes, adverse effects, distribution patterns, mitigation measures of Earthquake, Tsunami, Cyclone, Flood and Landslide. Disaster management cycle.
Unit II: Case Studies
Studies to understand above mentioned disasters (National as well as International) occurred in past and their inferences
Unit III: Disaster Preparedness
Disaster Management Act, Guidelines, NDMA. Vulnerability Assessment & Warning systems for above said disaster types.
Unit IV: Disaster Response
Programmes and strategies for disaster reduction. Communications
Unit V: Disaster Resistant Construction Techniques

Pre disaster, emergency, transition, and recovery. Disaster management plan, Natural crisis management committee, State crisis management group.
Unit VI : Disaster Risk Management In India
Risk reduction measures through land use control, site planning and land management, design and construction of structures for above mentioned disasters

Suggested Reading

1. Introduction to International Disaster Management by Damon P. Coppola
2. Introduction to Disaster Management by Vaidhyanathan
3. Introduction To Disaster Management By Satish Modh
By Pardeep Sahni, Alka Dhameja, Uma Medur

OR

Course Content: Sustainable Cities & Energy Compliance

Unit I: People, Environment & Buildings
Relationship between people and environment, impact of people on environment and vice versa, extent of the energy and environmental crises facing the world ,Need for implementing energy efficiency on an international, national and individual basis in the context of the building industry & environmental issues. Introduction to Indoor environment – spatial environment, Thermal environment, visual environment, sonic environment and olfactory environment
Unit II: Climate and Built form Responses
Global climate factors, elements of climate, classification of climate zones, desirable conditions, principals of thermal conditions and STI, body heat exchange, thermal balance, psychometric chart, sun path, sun angles ,SAP, sunshine hours, and solar noon, declination, extraterrestrial radiation, solar constant, radiation on different of different directions with different inclination of walls. Radiation spectrum, spectral sensitivity of eye, visual cone and comfort, daylight assessment, types of reflection, glare and quality and spread of light in buildings. Sound waves, audible range of sounds, equal loudness

controls, noise reduction systems, sound transmission path. Emphasis on responses related to cultural, strategic, technological, social and physical with specific reference to climate and built forms.
Unit III: Traditional Wisdom and Sustainable Concepts
Socio-cultural aspects in the spatial formation of traditional buildings under different climate zones in India. Concepts of ‘Sacred build-up and Landscape’, An Architectural and Theological Interface, Indigenous knowledge, antiquity, Indian vernacular architecture concepts covering informal, functional architecture of structures, built of local materials and designs to meet the needs of the local people and the intricate variations in local social customs, craftsmanship and climate
Unit IV: Sustainable Built Environment, Issues and approaches
Building on the general appreciation of this area in the core studies, students will be required to have a greater insight into matters relating to specific issues concerning the environment and the ecology. An appreciation of particular issues relating to urban and rural morphological sensitivity will be expected. Scarce material/physical resources should be discussed in the context of (a) choice of materials and (b) diminishing natural resources as should eco-friendly and 'safe' materials with specific reference to thermal, visual comforts. Besides, Students should have an appreciation of aesthetic issues in the built environment. The participants should also have knowledge of the principal considerations involved in the evaluation or survey of built up environment intended for sustainable concepts. They should be familiar with safety considerations relating to the built environment
Unit V: Water and Built Forms, Land and Vegetation
Introduction, water demand, growing water misuse, pollution, threat to environment, social implications, sustainability of water recourses, ground water management, issues related to urban water supply. Running water and underground water; channel networks and drainage basins, hill slope geomorphology.

Suggested Reading

1. Renewable Energy for Smart and Sustainable Cities by Hatti, Mustapha (Ed.)
2. The Sustainable Cities by Steven Cohen
3. Energizing Sustainable Cities edited by Arnulf Grübler, David J. Fisk

OR

Course Content: Environmental Impact Assessment

Unit I: Introduction
Impact of development projects under Civil Engineering on environment - Environmental Impact Assessment (EIA) - Environmental Impact Statement (EIS) – EIA capability and limitations – Legal provisions on EIA.
Unit II: Methodologies
Methods of EIA –Check lists – Matrices – Networks – Cost-benefit analysis – Analysis of alternatives – Case studies.
Unit III: Prediction and Assessment
Assessment of Impact on land, water and air, noise, social, cultural flora and fauna; Mathematical models; public participation – Rapid EIA
Unit IV: Environmental Management Plan
Plan for mitigation of adverse impact on environment – options for mitigation of impact on water, air and land, flora and fauna; Addressing the issues related to the Project Affected People – ISO 14000

Suggested Reading

1. John G. Rau and David C Hooten (Ed), “Environmental Impact Analysis Handbook”, McGraw-Hill Book Company, 1990.
2. “Environmental Assessment Source book”, Vol. I, II

OR

Course Content: Earthquake Resistant Structure

Unit I: Elementary Seismology

Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India & and the States. Causes of earthquake, seismic waves; magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions, Flexibility of long & short period structures; concepts of response spectrum.
Unit II: Site Planning, Building forms and Architectural design concepts for Earthquake resistance
Historical experiences, Site Selection & Site Development Building forms: - Horizontal & vertical eccentricities, mass and stiffness distribution, soft storey etc. Seismic effects related to building configuration. Plan & vertical irregularities, redundancy & setbacks. Special Aspects: - Torsion, appendages, staircases, adjacency, pounding Contemporary international approaches
Unit III: Performance of Ground and Buildings in Past Earthquakes
Earthquake Effects:- On ground, soil rupture, liquefaction, landslides. Behaviors of various types of buildings, lifelines and collapse patterns. Behavior of Non Structural Elements like services, fixtures, mountings. Social & Economic Consequences of earthquakes.
Unit IV: Seismic Design Principles
Concept of seismic design, stiffness, strength, period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities. Ductility based design: Design of energy absorbing devices, Seismic base isolation and seismic active control

Reference Books

1. Chopra AK, Dynamics of structures, prentice hall, 1995
2. Guidelines for earthquake resistant non-engineered construction, Revised ed. Of “Basic concept of seismic codes” Vol I part 2, 1980, IAEE, Japan, reprinted by National information centre of earthquake engineering, IIT Kanpur.

OR

Course Content: Sustainable and Intelligent Buildings

Unit I: Introduction to Sustainable and Intelligent Buildings
Social, economic, environmental factors, ecological footprint, local and worldwide sustainable benchmarks, building ecosystem, building lifecycle Concept. Concept of intelligent buildings, energy efficiency, vertical transportation systems, communication systems, security systems, building automation and lighting systems.
Unit II: Sustainable design
Principles and strategies, site design, energy management, renewable energy, sustainable material selection, water management, indoor air quality, alternative energy, environmental systems, environmental assessment methods Special Aspects: - Torsion, appendages, staircases, adjacency, pounding Contemporary international approaches
Unit III: Building Management Systems
Methods to control, monitor and optimize building services, eg., lighting, heating, security, CCTV and alarm systems, access control, audio-visual and entertainment systems, ventilation, filtration and climate control, etc., even time & attendance control and reporting (notably staff movement and availability).

Reference Books

1. Moore F., Environmental Control System McGraw Hill, Inc., 1994.
2. Brown, G Z, Sun, Wind and Light: Architectural design strategies, John Wiley, 1985.
3. Cook, J, Award - Winning passive Solar Design, McGraw Hill, 1984
4. Intelligent Buildings: An Introduction by Derek Clements-Croome
5. Intelligent Buildings: Design, Management and Operation BY Professor Derek ClementsCroome

OR

Course Content: Energy conscious Architecture

Unit I: Introduction
Types, availability and reserves of conventional and non-conventional energy sources. Energy Conservation, Indian Energy Conservation Act 2001 Features, Energy Star Rating of buildings and Equipment's, Bureau of Energy Efficiency.
Unit II: Energy Conservation Building Code (ECBC)
Energy Building Code, Guidelines: Thermal Insulation, Heating, Ventilation and Air . Conditioning System, Building Lighting Design: Lighting levels, light efficient options, CFL, LEDs, Fixtures, Day lighting timers, Building Energy Management.

Reference Books

1. "Renewable Energy Sources and Their Environmental Impact", Shahid A. Abbasi, Naseema Abbasi; PHI Learning Pvt. Ltd., 2004
2. "Energy efficient buildings: architecture, engineering and environment", Dean Hawkes, Wayne Forster; W.W. Norton & Company, 2002
3. Indian Energy Conservation Act 2001, GoI
4. Energy Conservation Building Code Manual, GoI

Name of The Course	M38 Smart Cities			
Course Code	ARMO 5002			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
			50	2

Course Objectives

1. To understand the basic concepts of the Sustainable Cities & Energy Compliance
2. To understand the process of framing surveys related to the Sustainable Cities & Energy Compliance

3. To manage students for presenting research work based on different seminar related to Sustainable Cities

4. To understand to inter relationship between People with Environment and Buildings

5. To provide knowledge on the underlying concepts of intelligent buildings

6. To familiarize students the role of energy in built environment and for the efficient use of energy in design process.

Course Outcomes

CO1	Illustrate basic concepts of smart city
CO2	Illustrate basic concepts of resilient city
CO3	Illustrate the contemporary trends in urban development
CO4	Apply basic concepts of internet of things related to urban context
CO5	Internalize the values of vision/ mission of govt. policies related to urban fabric

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content: Disaster Mitigation and Management

Unit I: Project Work: (Field Work, Case Studies)
The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects are conceived creatively based on the geographic location and hazard profile of given region.

Suggested Reading

1. Introduction to International Disaster Management by Damon P. Coppola
2. Introduction to Disaster Management by Vaidhyanathan

3. Introduction To Disaster Management By Satish Modh

By Pardeep Sahni, Alka Dhameja, Uma Medur

OR

Course Content: Sustainable Cities & Energy Compliance (Elective III-B)

Unit I: Solar Passive Design (Concepts, Strategies & Services)
Introduction of passive solar architecture, appreciation of Built form for different climates, building clusters and solar exposure, thermal environment. Types of passive systems, direct gain, thermal storage wall, attached green house, thermal storage roof and convective loop. Modern and postmodern passive architecture, methods, strategies, systems, and construction details emphasizing the passive architecture and non-active services.

Suggested Reading

1. Renewable Energy for Smart and Sustainable Cities by Hatti, Mustapha (Ed.)
2. The Sustainable Cities by Steven Cohen
3. Energizing Sustainable Cities edited by Arnulf Grübler, David J. Fisk

OR

Course Content: Environmental Impact Assessment

Unit I: Case Studies
EIA for infrastructure projects – Bridges – Stadium – Highways – Dams – Multi-storey Buildings – Water Supply and Drainage Projects

Course Content: Earthquake Resistant Structure

Unit I: Structural Detailing & Earthquake Resistant Construction Details
IS Code provisions for the buildings:- IS:1893-2002, IS:4326-1993 Horizontal & vertical seismic co-efficient, valuation of base shear, distribution of shear forces in multistory bldg.

Seismic Detailing of Masonry buildings (IS: 4326), Seismic Designs & Detailing of RC & Steel Buildings: IS: 1893 - 2002; IS: 13920 - 1993; IS: 456 - 2000; IS: 800 - 2004.

Special reinforcing and connection details in structural drawings. Various Types and construction details of

Foundations, soil stabilization, retaining walls, plinth fill, flooring, walls, openings, roofs, terraces, parapets, boundary walls, underground and overhead tanks, staircases and isolation of structures.

Local practices: traditional regional responses.

Suggested Reading

1. John G. Rau and David C Hooten (Ed), "Environmental Impact Analysis Handbook", McGraw-Hill Book Company, 1990.
2. "Environmental Assessment Source book", Vol. I, II

OR

Course Content: Sustainable and Intelligent Buildings

Unit I: Energy Management in Services

Energy in building design - Energy efficient and environment friendly building - Thermal phenomena - thermal comfort - Indoor Air quality - passive heating and cooling systems.

Reference Books

1. Moore F., Environmental Control System McGraw Hill, Inc., 1994.
2. Brown, G Z, Sun, Wind and Light: Architectural design strategies, John Wiley, 1985.
3. Cook, J, Award - Winning passive Solar Design, McGraw Hill, 1984
4. Intelligent Buildings: An Introduction by Derek Clements-Croome
5. Intelligent Buildings: Design, Management and Operation BY Professor Derek Clements Croome

OR

Course Content: Energy conscious Architecture

Unit I: Energy Management in Services

Introduction to Building rating systems in India. Detailed study on LEED and GRIHA (Green Rating for Integrated Habitat Assessment). Case study national and international examples.

Reference Books

1. Moore F., Environmental Control System McGraw Hill, Inc., 1994.
2. Brown, G Z, Sun, Wind and Light: Architectural design strategies, John Wiley, 1985.
3. Cook, J, Award - Winning passive Solar Design, McGraw Hill, 1984
4. Intelligent Buildings: An Introduction by Derek Clements-Croome
5. Intelligent Buildings: Design, Management and Operation BY Professor Derek Clements Croome

Course Content: Professional Practice-I

Unit III

- Contract –Types, Preparation of contract documents general conditions of contract, interim certificates defect liability period, retention amount and virtual completion.
- Duties and liabilities of architects, contractors.
- Articles of agreement, execution of work payment and Arbitration.
- Tenders – types and the process of calling, security and selection system.
- Pre- Tender qualifications and registration of contracts.
- Office organizations and management, Role of design staff and supporting managerial staff; Personal management.

Name of The Course	M39 Urban Design			
Course Code	ARMO 5003			
Prerequisite	Basics of Urban Design and Planning Social Illustration and People			
Co-requisite	Professional Ethics and Society			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To understand the basic concepts of the Urban Design
2. To understand the role of urban systems in society and its history
3. To understand Human Values: Morals, Values and Ethics and Professional Ethics

Course Outcomes

CO1	Appreciate basic concepts of urban design
CO2	Value the role of urban systems in society
CO3	Illustrate history of urban design
CO4	Illustrate concepts of professional practice
CO5	Design intervention in a bazaar street

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content: Architectural Design IX

Unit I: Study and analysis of urban spaces, modern concepts in urban design
<ul style="list-style-type: none"> • A brief study and analysis of urban space. • Study of Urban design theories of Christopher Alexander, Jane Jacob, Gordon Cullen and Kevin Lynch. Relevance of historic concepts of urban design in the present context-Critical analysis of

Indian cities & understanding the urban design projects of Singapore, China & United States.
Unit I : Basic principles & techniques in urban design
<ul style="list-style-type: none"> • Components in urban design composition. Urban scale, mass and space, definition of urban fabric, visual surveys and their influence for urban design, various methods of conducting a visual survey • Definition and purpose of open spaces and their hierarchy in urban design-hierarchy of utility spaces for residential, commercial, recreational and industrial use. Special focus on streets-Expressive quality of built forms, spaces in public domain.
Unit III- Renewal, Re-development and formulating urban design
<ul style="list-style-type: none"> • Definition and need for urban renewal and re-development, scope for urban renewal in India challenges and implementation methods of urban renewal for Indian historic towns and cities, impact of public participation. • Analysis and formulation of urban design guidelines for new developments. • National and international case studies for urban renewal.

Course Content: Professional Practice-I

Unit IV
<ul style="list-style-type: none"> • Human Values: Morals, Values and Ethics, Integrity, Work Ethics, Service Learning, Civic Virtue, Respect For Others, Living Peacefully, Caring, Sharing, Honesty, Courage, Valuing Time, Co-Operation, Commitment, Self Confidence, Spirituality. • Professional Ethics: Senses of ‘Professional Ethics’, Variety of model issues, types of inquiry, Moral dilemmas, Moral Autonomy, Kohlberg’s theory, Gilligan theory, Consensus and controversy, Profession and Professionalism, Professional Ideals And Virtues, Theories About Right Action, Self-Interest, Customs And Religion, Uses Of Ethical Theories. • GLOBAL ISSUES: Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-

- Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies.

Reference Books

1. “Ethic in Engineering”, Mark Martin and Roland Schinzinger, McGraw hill, 1999
2. “Architects Handbook, A Ready Reckoner”, Charanjit S. Shah, 2000
3. “Town Planning”, Rangwala, 2001
4. “Handbook on Professional Practice”. The Indian Institute of Architects.
5. “Professional Practice”, Roshan Namavati, 2004
6. “Estimation, Costing and Valuation (Professional Practice)”, Rangwala, 2002
7. “Directory of Architects, List of Architects and Professional documents – Council of Architecture
8. Architects Handbook”, A Ready Reckoner – Charanjit S. Shah

Name of The Course	M40-Mixed Use Development			
Course Code	ARMO 5004			
Prerequisite				
Co-requisite	Professional Ethics and Society			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To understand the basic concepts of the Urban Design
2. To understand the role of urban systems in society and its history
3. To understand Human Values: Morals, Values and Ethics and Professional Ethics

Course Outcomes

CO1	Illustrate concepts of various Land Uses and land planning
CO2	Apply basic concepts of town planning
CO3	Design intervention in transit oriented development
CO4	Develop a vision document for mixed land use

CO5	Integrate social, ecological and economic concerns
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Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content: Architectural Design IX

Project: Urban Design Intervention
<ul style="list-style-type: none"> • Design intervention into an existing urban precinct. • Creating proposal document, drawings, maps and 3D physical model for proposed project. • Urban outdoor lighting, urban green infrastructure, acoustic consideration for urban fabric, air quality at street level.

Course Content: Transport Planning (Elective IV-A)

Unit 1: Introduction
Transport and Socioeconomic Activities, Historical Development of Transport, Transportation in the Cities, Freight Transportation, Future Developments.

OR

Course Content: Urban & Regional Planning (Elective IV-A)

Unit 1: Introduction
Origin, evolution and history of human settlements- planned cities in India and the world- town definitions and classifications, terminologies, Urban design concept and theories, Physical, Environmental, infrastructure, housing aspects of Urban Planning, planning theories.

Suggested Books

1. The Image of the City Book by Kevin A. Lynch

2. The City in History: Its Origins, Its Transformations, and Its Prospects by Lewis Mumford (1972)
3. Local Planning: Contemporary Principles and Practice Edited by Gary Hack, et al. (2009)

- Urban outdoor lighting, urban green infrastructure, acoustic consideration for urban fabric, air quality at street level.

Name of The Course	M41-Sprawl			
Course Code	ARMO 5005			
Prerequisite				
Co-requisite	Professional Ethics and Society			
Anti-requisite				
	L	T	P	C
			150	6

Course Objectives

1. To understand the basic concepts of Components of planning; Benefits of planning; Arguments for and against planning
2. To understand the concepts and Theories of urbanization including Concentric Zone Theory; Sector Theory; Multiple Nuclei Theory

CO1	Apply basic concept of the elective topic
CO2	Appreciate the role of Elective topic in global scenario
CO3	Internalize the values of the elective
CO4	Conduct the surveys related to elective
CO5	Present research work through seminar

Continuous Assessment Pattern

Practical IA			Practical VIVA 4 (ETE)	Total Marks
VIVA 1	VIVA 2	VIVA 3		
15	15	20	50	100

Course Content: Architectural Design IX

Project: Urban Design Intervention
<ul style="list-style-type: none"> • Design intervention into an existing urban precinct. • Creating proposal document, drawings, maps and 3D physical model for proposed project.

Course Content: Transport Planning (Elective IV-A)

Unit I: Introduction to urban transport planning process
Transport Planning Process, Problem Definition, Solution Generation, Solution Analysis, Evaluation and Choice, Implementation, Sequence of Activities Involved in Transport analysis.
Unit I: Trip Generation Analysis
Trip Production Analysis, Category Analysis, Trip Attraction Modelling. Mode Choice Modelling: Influencing Factors, Earlier Modal Split Models, Trip-End Type Modal Split Model, Trip-Interchange Modal Split Model, Disaggregate Mode-Choice Model, Logit Model of Mode Choice, Binary Choice Situations, Multinomial Logit Model, Model calibration, Case studies.
Unit III: Route Assignment
Description of transport network, Route Choice Behavior, The Minimum Path, Minimum Path Algorithm, Route Assignment Techniques, All-or-Nothing Assignment, Multipath Traffic Assignment, Capacity-Restrained Traffic Assignment
Unit IV: Transportation Surveys
Definition of Study Area, Zoning, Types of Movements, Types of Surveys, Home- Interview Survey, Commercial Vehicle Survey, Intermediate Public Transport Survey, Public Transport Survey, Roadside-Interview Survey, Cordon-Line Survey, Post-Card Questionnaire Survey, Registration-Number Survey, Tag-on-Vehicle Survey.
Unit V: Transport Related Land-Use Models
Development of Land - Use models, The Lowry Model, Application of Lowry Model.
Unit VI: Urban Structure
Urban Activity Systems, Urban Movement Hierarchies, Types of Urban Structure, Centripetal-Type Urban Structure, Grid- Type Urban Structure, Linear-Type Urban Structure, Directional Grid Urban Structure.

Suggested Books

1. Transport Planning Book by David Banister
2. Transport Planning and Traffic Engineering Textbook by Coleman A. O'Flahert

OR

Course Content: Urban & Regional Planning (Elective IV-A)

<p>Unit I: Fundamentals of Urban and Regional Planning</p> <ul style="list-style-type: none"> • Various definitions of town and country planning; Goals and objectives of planning; Components of planning; Benefits of planning; Arguments for and against planning • Definition of development plan; Types of development plans: master plan, city development plan, structure plan, district plan, action area plan, subject plan, town planning scheme, regional plan, sub-regional plan; Planning Advisory Group report and the UDPFI Guidelines; Sector plans and spatial plans; Defining development and development control regulations, types of development control; Implications of violations of development control regulations • Theories of urbanization including Concentric Zone Theory; Sector Theory; Multiple Nuclei Theory and other latest theories; Land Use and Land Value Theory of William Alonso; City as an organism: a physical entity, social entity and political entity.
<p>Unit II: Human Aspects of Urban Form</p> <ul style="list-style-type: none"> • Relationship of social, cultural and humane aspects to physical planning. Basic human psychology and its relation to planning. • Economics: Introduction, Definition & scope of economics in Urban Planning, Regional planning macro and micro economics. Planning need, issues and five year plans, Economic uplift, backwardness, Poverty alleviation; Sustainable development, conservation measures, reduce recycle, reuse concept, care for future generation, carrying capacity and limits, study of water as a resource.
<p>Unit III: Cities in Asia, India, Africa, Europe and the Americas, Classical Chinese, Roman and Greek cultures</p>

<ul style="list-style-type: none"> • Ancient examples of carefully planned and designed cities in Asia, India, Africa, Europe and the Americas, Classical Chinese, Roman and Greek cultures (Hippodamus of Miletus). • The Post-industrial City. Detailed description with the various socio economic reasons and influences on physical planning highlighting the impact of industrialization on physical planning. Garden City and Regional Perspective, Neighborhood and Communities – Birth and development of the neighborhood idea, Urban renewal. • Contributions of Ebenezer Howard, Patrick Geddes, Lewis Mumford, Le-Corbusier and others in planning. Concept of the informal sector. Industrialization and industrial development: Policy in India, Agriculture in India, industrial development. Socio economic implications of industrialization. Case studies of towns and concepts developed post war
<p>Unit IV</p> <ul style="list-style-type: none"> • Understanding and documenting an Urban component such market place, organic and planned, residential districts, station areas, mill lands, urban villages, transport hubs. • Baseline surveys for a small/ medium town Data collection and analysis, comparing with benchmark/standards. Graphic representation of the same.

Name of The Course	M42: Architectural Thesis			
Course Code	ARMO 5006			
Prerequisite	Expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment. The scope and extent of the thesis work shall be substantial and realizable in application or concept as appropriate to the selected area of work.			
Co-requisite				
Anti-requisite				
	L	T	P	C
			400	26

Course Objectives

1. To prepare student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
2. To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
3. To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.
4. To provide knowledge about the elements of valuation and factors affecting valuation

CO1	Apply basic concept of the Architectural Thesis
CO2	Incorporate knowledge in design within the thesis topic
CO3	Expertise in effecting positive changes in our built environment
CO4	Implementation of methodologies and design process in thesis
CO5	Present work throughout the discussion period

Continuous Assessment Pattern

Practical IA		
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VIVA 1	VIVA 2	VIVA 3	Practical VIVA 4 (ETE)	Total Marks
15	15	20	50	100

Course Content: Architectural Design IX

<p>Introduction</p> <p>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 the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a ‘live’ programme, as long as the topic can result in tangible ‘built environment’ solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic’s relevance to serve the laid down specific objectives inherent in the philosophy of the institution.</p> <ul style="list-style-type: none"> • 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 drawings and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail. • The report, in duplicate, shall be submitted in bound form together with prints/photographs of all the drawings and models. All relevant/ pertinent drawings, sketches, models from previous stages to be put up for the jury to show evolution of design. <p>STAGE- I Pre Synopsis of presenting three topics- It includes Need, scope, aim, objective, site, methodology, limitations, feasibility, Proposed site with valid proof literature, case study and references</p>

Need, scope, aim, objective, site, methodology, limitations, feasibility, proposed site with valid proof, literature, case study and references

STAGE -II Detailed Synopsis presentation with chapterization- It includes Need, scope, aim, objective, site, methodology, limitations, feasibility literature, case study and references in detail.

STAGE- III Pre-Design Study- It includes site study and analysis, theoretical Framework, selection criteria of case studies (Min. 3) and area analysis.

STAGE- IV Revision of Pre-Design Study Conceptual Design & Zoning- It includes site study and analysis, theoretical Framework, case studies (Min. 3) and area analysis. One Concept, bubble diagram, block model, zoning, need form and context.

STAGE-V Progress on Preliminary Design- 2 Concept options, Discussion on following Aspects Site plan, Building plans all levels, 2 sections, 2 elevations, and all the details showing architectural expression of materials, color, levels etc., at Model in box board.

STAGE- VI Preliminary Design- It includes site plan, Building plans at all levels, 2 sections, 2 elevations, all the details showing architectural expression of materials, color, levels etc, Model in box board.

STAGE- VII Structure & Building Services- It includes Site plan showing all the services as per your design (HVAC, electrical, water supply, firefighting, lighting & acoustics).

STAGE- VIII Pre- Final Jury- It includes all drawings in detail and 3-D physical model in detail.

STAGE- IX Final Internal Jury- It includes all drawings in detail and 3-D rendered views, 3-D model and final report (3 hard bound copies).

STAGE-X- Final External Jury- It includes all drawings in detail and 3-D rendered views, 3-D model and final report.

Course Content: Professional Practice-II

Unit I-Valuation
Valuation of immovable properties, elements of valuation and factors affecting valuation; Techniques of valuation of landed and building property; Value classification and types of valuation.
Unit II-Arbitration
Arbitration, Arbitrator, Umpire, Nature of arbitration. Appointment, Conduct, Powers, and duties of arbitrators and umpires; Procedure of arbitration and preparation of awards.
Unit III-Law related to Land and Law of Control
The land acquisition Act, UP Urban Development Act 1973 and Partnership Act, 1932
Unit IV-Law related to Conservation
The elements of the Ancient monument, (site remains) Act 1956.

Suggested Books &References:

Anderson, J. and Poole, M. (1998). Thesis and assignment writing. Brisbane: John Wiley.

2. Borden, I. and Ray, K. R. (2006). The dissertation: an architecture student's handbook. 2nd Ed. Oxford: Architectural Press.

3. Fink, A. (1998). Conducting research literature reviews: from paper to the Internet. Thousand Oaks: Sage.

Murray, R. (2005). Writing for academic journals. Berkshire: Maidenhead, Open University Press.

4. Apte, V. S. (2008). Architectural Practice and Procedure. Pune: Padmaja Bhide.

5. Chappell, D. M. And Willis, A. (2005). The architect in practice. 9th Ed. Oxford: Blackwell Publications.

6. Charles, E. (1996). TQM and ISO 9000 for architects and designers. New York: McGraw-Hill.

4. COA. (1989). Architects (Professional conduct)

Regulations, Architectural Competition guidelines.
Council of Architecture Publications.

7. COA. (2005). Handbook of Professional Documents. Council of Architecture.

8. Eldred, G. W. (2008). The Beginner's Guide to Real Estate Investing. John Wiley & Sons.

9. Lewis, R. K. (1985). Architect? : A candid guide to the profession. Cambridge: MIT Press.

10. Namavati, R. (1984). Professional practice. Mumbai: Lakhani Book Depot.

11. Piotrowski, A. and Williams, J. (2001). The Discipline of Architecture. University of Minnesota Press.

12. Rangwala, S. C. Valuation of Real Properties. Charotar Publications.

13. Scott, J. J. (1985). Architect's Practice. London: Butterworth.