

Punya Shlok Ahilyadevi Holkar Solapur University, Solapur



**NAAC Accredited-2015
'B' Grade (CGPA 2.62)**

Under the Faculty of:
Science & Technology

CHOICE BASED CREDIT SYSTEM STRUCTURE 2026 PATTERN

Bachelor of Architecture B.Arch. First year – Sem. I and Sem. II

Teaching Schemes and detailed Syllabus

W.E.F A.Y. 2026 -27

COURSE STRUCTURE BACHELOR OF ARCHITECTURE [B.Arch.]

The syllabus structure is for First to Fifth year of B.Arch course . The periods considered for calculating the teaching load are of 60 min duration. while calculating credits ,the Council of Architecture New Delhi guidelines are adopted :- (i)One lecture period or hour shall have 1 credit .(ii) One Lab / Workshop / Studio excersises or seminar periods / hours shall have 1 credit .(iii) One Design/ Construction Studio / Project / Thesis periods or hours shall have 1 credit . The detail structure of the syllabus for the ten semester course is given below. (Note: ICA= Sessional work; ISE = In Semester exam ; ESE = End semester exam for Theory & oral ; L= Lecture, P- Practical , S=Studio, T=Total)

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Faculty of Science and Technology

Choice Based Credit System structure of First Year B.Arch with effect from (w.e.f) - 2026-27

As per Council of Architecture ,New Delhi (COA) Guidelines

Scheme of Teaching and Examination of B.Architecture First year - Semester I

Subject Code	Subject category	Subject Title	Teaching scheme in Periods/ Week			Examination Scheme										
			60 minutes/ L/P/S			Theory				Practical/Viva-voce				Total	credits	
			Lectures/ Week	Practical, Studio / Week	Total Periods /Week	Paper duration in hours	ISE		ESE		ICA		ESE			
							L	P/S	T	Max.	Min.	Max.	Min.	Max.		Min.
								50%		45%		50%		45%		
26 AR1-01	PC	Architectural Design- I	1	7	8	—	—	—	—	—	100	50	150	67	250	8
26 AR1-02	BS & AE	Building Construction and Material-I	1	5	6	4	—	—	100	45	50	25	100	45	250	6
26 AR1-03	BS & AE	Theory of Structure -I	2	—	2	3	30	15	70	31	—	—	—	—	100	2
26 AR1-04	PC	Human Settlement Planning	2	—	2	3	30	15	70	31	—	—	—	—	100	2
26 AR1-05	PC	Architectural Graphics and Drawing -I	1	3	4	—	—	—	—	—	100	50	—	—	100	4
26 AR1-06	PC	Basic Design and Visual Arts -I	—	3	3	—	—	—	—	—	100	50	—	—	100	3
26 AR1-07	PC	Workshop-I	—	3	3	—	—	—	—	—	50	25	—	—	50	3
26 AR1-08	EC/PAEC	Elective -I A.Architectural Vocabulary B. Communication Skills C. Arts and Art Forms	—	2	2	—	—	—	—	—	50	25	—	—	50	2
		Grand Total			30		60		240		450		250		1000	30

Abbreviations: L- Lectures, P- Practicals , S- Studios , ISE- In Semester Exam., ESE - End Semester exam , ICA- Internal Continuous Assessment

Subject Categories : PC - Professional Core Courses ,BS & AE - Building Sciences and Applied Engineering , PE - Professional Elective , PAEC- Professional Ability Enhancement Courses , SEC - Skill Enhancement courses

Number of subjects / Head - 08		Number of Theory Examination - 03	Number of Practical/Viva-Voce Examination - 02
Note :	1. Theory exam - ISE -Internal Tests - marks to be awarded by conducting Minimum Two Test by the subject teacher ,ESE - University Theory examination		
	2. Practical/Viva-Voce exam - Prograsive marks (ICA) to be awarded by the subject teacher . Practical/ Viva - Voce examination (ESE - Oral) shall be conducted by one internal and two external examiner appointed by the university .		

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Faculty of Science and Technology

Choice Based Credit System structure of First Year B.Arch with effect from(w.e.f). 2026-27	
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As per Council of Architecture ,New Delhi (COA) Guidelines

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Abbreviations: L- Lectures, P- Practicals, S- Studios, ISE- In Semester Exam., ESE - End Semester exam, ICA- Internal Continuous Assessment

Subject Categories : PC - Professional Core Courses ,BS & AE - Building Sciences and Applied Engineering , PE - Professional Elective , PAEC- Professional Ability Enhancement Courses , SEC - Skill Enhancement courses

Number of subjects / Head - 08

Number of Theory Examination - 04

Number of Practical/Viva-Voce Examination - 02

Note :	1. Theory exam - ISE -Internal Tests - marks to be awarded by conducting Minimum Two Test by the subject teacher , ESE - University Theory examination
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	2. Practical/Viva-Voce exam - Prograsive marks (ICA) to be awarded by the subject teacher .Practical/ Viva - Voce examination (ESE - Oral) shall be conducted by one internal and two external examiner appointed by the university
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Grade and Grade Point Average:

A grade assigned to each head based upon marks obtained by the student in examination of the course.

CONVERSION OF MARKS INTO GRADES SGPA				
Sr.No.	Range of Marks	Grade	Grade Point	Description of Performance
1	80 onwards	O	10	EXCELLENT /OUTSTANDING
2	70-79	A+	9	VERY GOOD
3	60-69	A	8	GOOD
4	55-59	B+	7	FAIR
5	50-54	B	6	ABOVE AVERAGE
6	45-49	C+	5	AVERAGE
7	<45	F	0	FAIL
8		DR		DROPPED OUT

CONVERSION OF AVERAGE GRADE POINTS INTO GRADES		
Sr.No.	SGPA/CGPA	Grade
1	9.5-10	O
2	8.5-9.49	A+
3	7.5-8.49	A
4	6.5-7.49	B+
5	5.5-6.49	B
6	4.5-5.49	C+
7	<4.49	F

Computation of SGPA and CGPA

- 1) The University adopts absolute grading system wherein the marks are converted to grades, and every semester result will be declared with semester grade point average (SGPA) and Cumulative Grade Point Average (CGPA). The CGPA will be calculated for every semester, except for the first semester.
- 2) The grading system with the letter grades and the assigned range of marks under absolute grading system are as given below:

Computation of SGPA and CGPA

- A) The following expressions shall be used to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) respectively:

$$SGPA = \frac{\sum \text{CourseCredits} \times \text{GradePoints for all the Courses in that Semester}}{\sum \text{CourseCredits for all Courses in that Semester}}$$

$$CGPA = \frac{\sum \text{CourseCredits} \times \text{GradePoints for all Courses excluding those with F grades until that Semester}}{\sum \text{CourseCredits for all Courses excluding those with grades until that semester}}$$

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the grade cards.

Illustration for Computation of SGPA and CGPA**Sem. I**

(a) SGPA and CGPA Calculations: An Illustrative Example for one academic year							
Semester (Odd:I, Even:II)	Course Number	Credits	Marks scored	Grade Points	Grade	Credit points	SGPA
	1	2	3	4	5	(2x4) 6 (2x4)	7
SEM.I	21 AR1-01	8	45	0	F	8X0 = 0	SGPA = 132/30 = 4.40
SEM.I	21 AR1-02	6	48	5	C+	6x5 = 30	
SEM.I	21 AR1-03	2	50	6	B	2x6 = 12	
SEM.I	21 AR1-04	2	50	6	B	2x6 = 12	
SEM.I	21 AR1-05	4	50	6	B	4x6 = 24	
SEM.I	21 AR1-06	3	64	8	A	3x8 = 24	
SEM.I	21 AR1-07	3	53	6	B	3x6 = 18	
SEM.I	21 AR1-08	2	54	6	B	2x6 = 12	SGPA = 4.40
		30 (*22)				132	

(22*): Total credits of the semester excluding the credits of the courses under F grade. Considered for the calculation of CGPA of the two consecutive semesters under consideration.

Sem.II

(a) SGPA and CGPA Calculations: An Illustrative Example for one academic year							
Semester (Odd: I, Even:II)	Course Number	Credits	Marks scored	Grade Points	Grade	Credit points	SGPA
	1	2	3	4	5	(2x4) 6 (2x4)	7
SEM.II	21 AR2-01	8	43	0	F	8X0=0	SGPA = 139/30 = 4.63
SEM.II	21 AR2-02	6	50	6	B	6x6 = 36	
SEM.II	21 AR2-03	2	54	6	B	2x6 = 12	
SEM.II	21 AR2-04	2	84	10	O	2x10=20	
SEM.II	21 AR2-05	4	50	6	B	4x6=24	
SEM.II	21 AR2-06	3	51	6	B	3x6= 18	
SEM.II	21 AR2-07	3	49	5	C+	3x5 = 15	SGPA= 4.64
SEM.II	21 AR2-08	2	55	7	B+	2x7 = 14	
		30 (*22)				139	

(22*): Total credits of the semester excluding the credits of the courses under F grade. Considered for the calculation of CGPA of the two consecutive semesters under consideration.

CGPA = $132 + 139$ (TOTAL SGPA SEM.I + SEM.II) / $22+22$ (EARNEDCREDITS) = 6.15

CGPA = 6.15

If the Student secures letter grades as detailed below after reappearance to SEE, then the SGPA and CGPA shall be calculated as indicated below.

Sem. I

(a) SGPA and CGPA Calculations: An Illustrative Example for one academic year							
Semester (Odd: I, Even:II)	Course Number	Credits	Marks scored	Grade Points	Grade	Credit points	SGPA
	1	2	3	4	5	(2x4) 6 (2x4)	7
SEM.I	21 AR1-01	8	50	6	B	8X6=48	SGPA = $132+48/30$ = 6.00
		30				148	
							SGPA = 6.00

Sem.II

(a) SGPA and CGPA Calculations: An Illustrative Example for one academic year							
Semester (Odd:I,Even:II)	Course Number	Credits	Marks scored	Grade Points	Grade	Credit points	SGPA
	1	2	3	4	5	(2x4) 6 (2x4)	7
SEM.II	21 AR2-01	8	55	7	B+	8X7=56	SGPA = $139+56/30$ = 6.50
		30				139	
							Sgpa = 6.50

CGPA = $180 + 195$ (TOTAL SGPA SEM.I + SEM.II) / $30+30$ (EARNEDCREDITS) = 6.25

CGPA = 6.25

B) (b) CGPA Calculation of the Programme: An Illustrative Example

SEMESTER	IST YEAR	IIND YEAR	IIIRD YEAR	IVTH YEAR	VTH YEAR	TOTAL
CREDITS OF THE SEMESTER	60	60	60	50	40	270
CGPA	6.25	7.50	6.50	8.00	10.00	38.5

CGPA = $(60 \times 6.25 + 60 \times 7.50 + 60 \times 6.5 + 50 \times 8 + 40 \times 10) / 270 = 2015/270 = 7.46$

CGPA = 7.46

B.ARCH. SEM.I**26 AR1 – 01: ARCHITECTURAL DESIGN- I**

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	07	07	ISE	ESE	ICA	ESE	
Total	08	08	--	--	100	150	250

Course Objectives

The course aims to:

1. Develop skills in freehand sketching and visual representation using different media.
2. Introduce anthropometry, human movement, and spatial requirements.
3. Develop an understanding of basic architectural design principles.
4. Develop skills in functional space planning, activity relationships, and circulation.
5. Encourage creativity and design thinking through time-bound exercises.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Demonstrate freehand sketching and visual representation using appropriate media.
 CO2: Apply anthropometric principles to determine human dimensions and space requirements.
 CO3: Analyse activities, functional requirements, and circulation for basic architectural spaces.
 CO4: Develop functional spatial layouts for simple residential units based on user needs.
 CO5: Create innovative design solutions through time-bound architectural exercises.

Course Curriculum:

Unit 1	Sketching	Freehand sketching with different media. Preferably outdoor cityscapes, Monuments, objects with varying surfaces, volumes using various time modes. (Same object in two minutes to two hours/ outdoor or indoor)
		Anthropometric sketches along with live models of units in design along with Interior furniture.
Unit 2	Introduction Architectural Design	Introduction to Architecture, its scope, relation to the fields of Science & Technology, Mathematics, Philosophy, Religion, Sociology, Psychology, etc.
		Introduction to Anthropometry; minimum and optimum area requirements with respect to human body and its postures; movement and circulation spaces.
		Case studies of a single functional connecting spaces.
		Understand space planning based on activity, which will involve human activity and movement.
		Major Design Assignment: Design of a single function individual units in a residence like bedrooms, living room, kitchen, etc.
Unit 3	Time bound Assignment	Design - 6 hours and one day assignment
		Example: Product design, furniture element, Paper Art, Signage, etc.

Submission/Assignments:

1. Study documentation, reports and data collection in file form/drawing form.
2. Study of local architecture with respect to their contexts in the form of sketches; exploration of principles of architecture.
3. Progressive work, Design portfolio, Design Models, study models.

Reference Books:

1. Anthony Di Mari and Nora Yoo, " Operative Design: A Catalogue of Spatial Verbs", BIS Publishers.
2. Bruno Munari, "Design as Art", Penguin UK, 25-Sep-2008
3. Charles George Ramsey and Harold Sleeper, " Architectural Graphic Standards", 1992, Wiley
4. Deb Kumar Chakrabarti, " Indian Anthropometric Dimensions for Ergonomic Design Practice", 1997
5. Frank Ching, James F. Eckler, "Introduction to Architecture", 2012, John Wiley & Sons, US
6. Frank D.K. Ching, " Architecture: Form, Space, and Order", 4th Edition, Sep. 2014, John Wiley & Sons
7. John Hancock Callender, " Time-Saver Standards for Architectural Design Data", 1982, McGraw-Hill
8. Neufert Architects' Data by Ernst Neufert
9. Francis D.K. Ching –Elements of
Architecture
10. Rendering with pen and ink
11. Pramod V.S. – Fundamentals in Architecture

26 AR1-02: BUILDING CONSTRUCTION AND MATERIAL- I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	05	05	ISE	ESE	ICA	ESE	
Total	06	06	---	100	50	100	250

Course Objectives

The course aims to:

1. Develop an understanding of load-bearing structural systems and building components.
2. Introduce tools and techniques of brick and stone masonry construction.
3. Develop knowledge of masonry foundations for different soil conditions.
4. Familiarize students with masonry bonds, junctions, piers, and buttresses.
5. Introduce alternative wall construction materials and their applications.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Identify and describe the components of load-bearing structures.
 CO2: Explain and demonstrate basic brick and stone masonry foundation techniques.
 CO3: Apply appropriate brick bonds and masonry junctions in construction.
 CO4: Demonstrate basic stone masonry, pier, and buttress construction techniques.
 CO5: Compare alternative wall construction materials based on their properties and applications.

Course Curriculum:**Building Construction:**

STRUCTURAL SYSTEM		
Unit 1	Introduction to load bearing masonry Structure.	a. Introduction to Various components of a building. b. Tools used in construction of brick and stone masonry.
SUB – STRUCTURE		
Unit 2	Masonry foundations for load bearing walls, piers and buttresses.	a. Simple load bearing foundations in brick and stone – spread and strip foundation b. Masonry foundations in black cotton soil - strip or pad, pier
SUPER STRUCTURE		
Unit 3	Brick masonry	a. Types of brick, b. Brick bonds up to 1.5 brick thick using cement mortar. (Header, Stretcher, Flemish, English, Rat trap bond) c. Brick masonry at junction -T-junction, L-junction, cross junction and stopped end d. Piers, Buttresses
Unit 4	Stone masonry	a. Various types of stone masonry using different mortar. b. Dry stone masonry.
Unit 5	Alternative materials for Wall construction	a. Concrete Masonry Unit, Clay Blocks, Fly Ash Blocks, Aerated Concrete Blocks, Stabilized Mud Blocks with mud mortar, Adobe, Cob (Introductory)

	Composite Walls	a. Wall construction using various materials (Introductory)
Unit 6	Retaining walls in masonry work	a. Construction of brick and stone masonry retaining wall (Gravity type) types – a. Brick mass retaining wall, b. Dry stone retaining wall, c. Concrete block retaining wall.

Building Material:

Unit	Index	Detailed
Unit 1	Soil	a. Different types of soils, b. Properties- bearing capacity of soil with respect to foundation, concept of bulb of pressure, angle of repose. c. Soils best suited for building construction
Unit 2	Sand	Sources of sand e. Properties of good sand f. Types and grade of sand used in construction. g. Uses of sand in building construction
Unit 3	Brick	a. Types of bricks b. Properties of bricks c. Uses of bricks
Unit 4	Stone	a. Quarrying, finishing and dressing of stones. b. Types of stones c. Properties of stones d. Uses of stones

Submission/Assignments:**Sheet work on**

1. Simple section showing all the building elements from foundation to parapet
2. Types of bricks
2. Brick bonds – stretcher bond, header bond, English and Flemish bond up to 1.5 BK. Thk, Rat trap bond
3. Brick masonry at Stopped end, T junction, L junction and cross Junction in brick wall
4. Joints in stone masonry
5. Types of rubble stone masonry with mortar, rubble dry stone masonry
6. Types of ashlar stone masonry with mortar, ashlar dry stone masonry
7. Simple masonry foundations – Spread footing, Strip foundation, foundation on sloping sites

Journal and sketches on building construction and material – Tools used in construction of brick and stone masonry, dressing of stones, Concrete Masonry Unit, Clay Blocks, Fly Ash Blocks, Aerated Concrete Blocks, Stabilized Mud Blocks with mud mortar, Adobe, Cob

Composite Wall construction using various materials.

Report – Site Visit and Case Study.

Model -Brick blocks

ESE Weightage: Building Construction 60% and Building Material 40%

Reference Books:

1. McKay, W. B. (2005). Building Construction Metric Vol. I–IV. 4th Ed. Mumbai
2. Moxley, R. (1961). Mitchell's Elementary Building Construction. London.
3. Rangwala, S.C. (1963). Building Construction: Materials and types of Construction. 3rd Ed. New York
4. Chudley, R. (2008). Building Construction Handbook. 7th Ed. London.
5. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi.
6. IS 1498 (1970) -classification and identification of soils for general foundations.
7. Rangwala, S. C. (1963). Engineering Materials. 3rd Ed. New York

26AR1 – 03: THEORY OF STRUCTURE – I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	02	02	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	--	--	ISE	ESE	ICA	ESE	
Total	02	02	30	70	--	--	100

Course Objectives

The course aims to:

1. Develop an understanding of basic structural components and structural systems.
2. Introduce different types of loads and their effects on structures.
3. Develop knowledge of forces, equilibrium, moments, and beam reactions.
4. Introduce graphic statics and graphical methods for structural analysis.
5. Develop understanding of centroid and centre of gravity of simple and compound sections.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Identify and explain structural components, structural systems, and SI units.
 CO2: Identify and classify major and minor loads acting on structures with reference to relevant IS codes.
 CO3: Analyse forces, equilibrium, moments, couples, and beam reactions using basic principles of statics.
 CO4: Apply graphic statics and graphical methods to determine resultants and beam reactions.
 CO5: Determine the centroid and centre of gravity of simple and compound sections using analytical methods.

Course Curriculum:

Unit-1	Introduction	Terminology of common structural components from foundation to roof Concept of structural components from foundation to roof, Types of structural systems – Load bearing and Framed structure, Difference between structural systems SI systems and Units
Unit-2	Loads	Concept of major loads acting on a structure like a) Dead load, b) Live load, c) Wind load, d) Earthquake load, e) Snow load along with relevant is codes, f) Concept of minor loads acting on a structure like thermal stresses, impact load, fatigue, creep
Unit-3	Force	1.Applied mechanics and Statics a) Importance of study of forces, b) Definition of force, c) Effects of forces, d) Different systems of forces, e) Principle of transmissibility, f) Principle of superposition, g) Resolution and composition of forces

		2. Equilibrium of Concurrent and Non-Concurrent forces a) Condition of equilibrium for a system of concurrent forces, b) Law of parallelogram, c) Polygon and triangular law of forces, d) Lami's theorem, e) Resultant and equilibrant of a system of concurrent forces, f) Moment as an effect of force, g) Couple and its properties, h) Varignon's principle, i) Condition of equilibrium for a system of non-concurrent forces
		3. Beam a) Definition, Types of supports, b) Types of beams classified as simply supported, c) cantilever, over-hanging, roller and hinged beam, d) Types of loads as point-load, uniformly distributed load, uniformly varying load, e) Determination of reaction of beam with different types of loading
		4. Graphic Statics a) Space diagram, b) Vector diagram, c) Polar and funicular polygon diagram, d) Bow's notation, e) Graphical condition of equilibrium, Determination of resultant force, Beam reaction by graphical method
Unit-4	Centroid and Centre of Gravity	a) Concept of Centroid and Centre of gravity, b) Formula of centroid for rectangular, triangular, circular, semi-circular, hollow rectangular and hollow circular section, c) Determination of centroid and centre of gravity of compound sections by analytical method

Submission /Assignments:

Topic-wise assignments

Reference books:

- 1.Strength of Materials by Khurmi.
- 2.Strength of Materials by A. P. Dongre.
- 3.Strength of Materials by Ramamrutham and S. Narayan.

26 AR 1 – 04: HUMAN SETTLEMENT PLANNING

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	02	02	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	--	--	ISE	ESE	ICA	ESE	
Total	02	02	30	70	--	--	100

Course Objectives

The course aims to:

1. Introduce students to the relationship between human beings, environment, culture, and the evolution of settlements.
2. Develop an understanding of the origin, growth, patterns, and classification of human settlements.
3. Familiarize students with prehistoric, ancient, and medieval settlements and their planning principles.
4. Examine the development of settlement planning through significant examples from Indian and world civilizations.
5. Understand the impact of the Industrial Revolution and the emergence of modern planning concepts.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Explain the relationship between human beings, natural environment, built environment, culture, and settlement development.

CO2: Identify and classify different settlement patterns, types, and stages of settlement growth.

CO3: Analyse the planning principles and characteristics of prehistoric and ancient settlements.

CO4: Examine the spatial, cultural, and planning features of medieval settlements in India and Europe.

CO5: Analyse the impact of the Industrial Revolution and explain the emergence of new settlement and planning concepts.

Course Curriculum:

Unit 1	Relationship between man, and environment	Physical Evolution of human being
		Natural and built- environment
Unit 2	Origin and growth of human settlement	Different phases of human settlement
		Role of River Banks in growth of early human settlement
Unit 3	Culture and civilization	Rise of Culture and Civilization, Elements of civilization
Unit 4	Human settlement	Patterns of Human settlement
		Classification settlement – Rural and Urban and their types
Unit 5	Pre historic settlements	Paleolithic, Mesolithic and Neolithic age houses and settlement of Catal Huyuk
Unit 6	Ancient settlements	Ancient - Mohenjo-Daro city planning, Vedic period- Vedic village, Buddhist culture in India- City of Pataliputra, cave settlements of Ajanta, Ancient town planning principles in India – Arthashastra
		Mesopotamia - City of Babylon
		Egyptian civilization- City of Kahun
		Greek Civilization – City of Athens
		Roman Civilization –Timgad city

Unit 7	Medieval settlements	Study of ancient Indian educational university- Nalanda, Temple town – Madurai
		Impact of Christianity on Europe – City Constantinople
		Renaissance settlements – Renaissance City
Unit 8	Industrial revolution	Industrial revolution and its effects
		New planning concept, factory town by Tony Garnier

Submission /Assignments:

Journal and sketches. Models of examples studied in above theory in group work.

Reference Books:

1. Francis D K Ching, Mark M. Jarzombek, Vikram Aditya Prakash, "A Global History of Architecture" by Wiley and Sons.
2. Town Planning by Abir Bandopadyay and G.K. Hiraskar
3. The Great Ages of World Architecture – By G.K. Hiraskar
4. Satish Grover, "Buddhist and Hindu Architecture in India", CBS Publishers and Distributors, 2003
5. History of Fine Arts in India and West

26 AR 1 – 05: ARCHITECTURAL GRAPHICS AND DRAWING –I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	04	04	--	--	100	--	100

Course Objectives

The course aims to:

1. Introduce students to architectural drawing instruments, materials, papers, and their appropriate uses.
2. Develop skills in line drawing, measured drawing, and architectural presentation techniques.
3. Develop proficiency in architectural lettering and graphic communication.
4. Familiarize students with metric and graphic scales and their application in architectural drawings.
5. Develop skills in representing building components, materials, symbols, and annotations using standard conventions.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Identify and use appropriate drawing instruments, papers, materials, and mediums for architectural drawings.

CO2: Apply different line types, pencil grades, measured drawing methods, and presentation techniques in architectural representation.

CO3: Demonstrate appropriate architectural lettering styles and proportions for effective graphic communication.

CO4: Apply metric and graphic scales accurately in architectural drawings.

CO5: Represent building components, materials, symbols, and annotations using standard architectural drawing conventions.

Course Curriculum:

Unit 1	Introduction	Introduction to different drawing instruments, paper, materials & Their uses.
Unit 2	Drawing Technics	Drawing line of different types, characteristics of lines with the help of different grades of pencils and mediums. Application of all types of lines in architectural drawings Making measured drawing of building & its parts. Presentation techniques.
Unit 3	Lettering	Introduction to architectural lettering, proportion of letter size as per scale, Different styles of lettering
Unit 4	Scale	Introduction of various proportions and scales, necessary for drawing to a Scale, Graphic scale. To understand Metric Scale
Unit 5	Building Components, Materials & Annotations	Representation of various building components such as doors, windows, steps, stairs, Chhajja, porch, canopy, balcony, roofs. Symbolic representation of building materials with color code as specified in Indian standard Code of practice.

Submission / Assignments:

Graphical Drawings: Student will prepare drawings using different graphical method, lettering, scales, and symbolic way

Graphics portfolio of term work on drawing sheets

References Books:

1. Robert W. Gill, Rendering with Pen and Ink
2. The Thames and Hudson Manuals
3. Francis D. K. Ching "Architectural Graphics" Van No strand Reinhold Co. 1985

26 AR 1 – 06: BASIC DESIGN AND VISUAL ARTS- I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	03	03	--	--	100	--	100

Course Objectives

The course aims to:

1. Introduce students to the fundamental visual elements of design and their application in architectural composition.
2. Develop an understanding of design principles, spatial relationships, and positive and negative spaces.
3. Familiarize students with materials through the study of their colour, texture, and visual qualities.
4. Develop an understanding of form through the study of solids, voids, light, and shade.
5. Develop skills in sketching, model making, and visual representation using various materials and media.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Identify and apply basic visual elements such as point, line, plane, shape, form, space, colour, and texture in design.

CO2: Apply principles of design such as balance, symmetry, contrast, proportion, rhythm, hierarchy, and unity in compositions.

CO3: Analyse and represent material qualities through texture, colour, and visual studies.

CO4: Explore and interpret forms through the study of solids, voids, light, and shade.

CO5: Demonstrate visual representation skills through sketching, model making, and various media and materials.

Course Curriculum:

Unit 1	Study of visual elements of design	Points, lines, planes, shapes, forms, space, colour and texture
Unit 2	Study of principles of design	Unity, balance, symmetry, contrast, scale, proportion, pattern, rhythm, hierarchy, focus Positive and negative spaces, Spatial relationships
Unit 3	Materials Study	Study of material through texture and colour
Unit 4	Forms	Study of forms with respect to light and shade; solids and voids
Unit 5	Sketching and visual representation of material	Sketching and visual representation of material in various media like paper, clay, plaster, wood, wire, wax, and photography

Submission /Assignments:

Assignments to cover the above topics i.e. 2-dimensional compositions, material Study of color wheel, and tones. Etc.

1. Models of studio work. Communicating and explain their models. Compositions made in studio work.
2. Documentation and portfolio of studio work.

Reference Books:

1. Architecture: Form Space and Order – Francis D. K. Ching
2. Design fundamentals in architecture- V. S. Parmar
3. Pattern Language – Christopher Alexander

26 AR 1 – 07: WORKSHOP – I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	03	03	--	--	50	--	50

Course Objectives

The course aims to:

1. Introduce students to masonry, carpentry, clay modelling, and model-making tools and their appropriate uses.
2. Develop basic skills in clay modelling, carving, and sculpturing techniques.
3. Familiarize students with various model-making materials and their properties, uses, and applications.
4. Develop skills in surface development, paper folding, origami, hand cutting, and other manual model-making techniques.
5. Develop the ability to construct solid and hollow geometrical forms using appropriate materials and techniques.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Identify and safely use basic masonry, carpentry, clay modelling, and model-making tools.

CO2: Demonstrate basic skills in clay modelling, carving, and sculpturing.

CO3: Select and use appropriate materials such as paper, board, foam, wood, acrylic, and plaster of Paris for model making.

CO4: Apply surface development, paper folding, origami, hand cutting, and manual techniques in model making.

CO5: Construct and present solid and hollow geometrical forms using suitable materials and model-making techniques.

Course Curriculum:

Unit 1	Introduction to masonry tools and carpentry tools.
Unit 2	Introduction to clay modelling tools for carving, sculpturing.
Unit 3	Introduction to modelling with various material like; paper, paper board, foam core board, wood, acrylic, plaster of Paris etc.
Unit 4	Model making techniques like surface development, paper folding, origami, hand cutting.
Unit 5	Basic model making manual techniques, different types of material and their techniques
Unit 6	Various solid and hollow geometrical – forms making.

Submission /Assignments:

1. Models of basic forms-cube, cone, dome and arch etc. Models of furniture units to scale of various elements like chair table room's furniture units etc.
2. Models of students' Architectural Design Studio Work and other allied subjects.

Reference Books:

1. Arjan Karssen & Bernard Otte, "Model Making: Conceive, Create and Convince", Frame Publishers (November 11, 2014)
2. David Neat, "Model-Making: Materials and Methods", CroWood Press, 2008
3. Jocqui Atkin, "250 tips, techniques, and trade secrets for potters", Barron's Educational Series, 2009
4. Megan Werner, "Model making", Princeton Archit.Press, 2010
5. Roark T. Congdon, "Architectural Model Building", Fairchild Books; 1 edition, 2010

26 AR 1 – 08: ELECTIVE -I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	02	02	ISE	ESE	ICA	ESE	
Total	02	02	--	--	50	--	50

The student will opt for any one of the following courses

A. Architectural Vocabulary

B. Communication Skills

C. Art and Art Forms

The detail syllabus for the above subjects is given hereby

A. ARCHITECTURAL VOCABULARY**Course Objectives**

The course aims to:

1. Introduce students to the basic elements and components of buildings and their terminology.
2. Develop an understanding of architectural terms used to describe form, space, elements, and architectural expression.
3. Familiarize students with technical terminology commonly used in building construction and building trades.
4. Introduce terminology associated with different architectural styles and periods.
5. Develop the ability to use appropriate architectural vocabulary in verbal, written, and graphic communication.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Identify and describe various building elements using appropriate architectural terminology.
 CO2: Apply architectural vocabulary to describe architectural forms, spaces, elements, and expressions.
 CO3: Explain and use technical terms related to building construction and building trades.
 CO4: Identify and interpret terminology associated with different architectural styles and periods.
 CO5: Demonstrate appropriate use of architectural vocabulary in architectural communication and documentation.

Course Curriculum:

Unit 1	Elements of building	To introduce different elements of building
Unit 2	Architectural expression	To introduce appropriate terms for architectural expression
Unit 3	Terms of Building trade	To introduce technical terms used in building trade
Unit 4	Terms specific to Architectural styles	To introduce terms specific to architectural styles

Submission / Assignments:

Sketch file and write-ups and sketches involving the introduced terms.

PPT presentation on selected topics.

Reference Books:

1. Francis D K Ching 'A visual dictionary of Architecture'
2. Alban Janson, Fundamental Concepts of Architecture: The Vocabulary of Spatial Situations Alban Janson
3. Edward T. White, A graphic vocabulary for architectural presentation

B. COMMUNICATION SKILLS

Course Objectives

The course aims to:

1. Develop reading and listening comprehension skills.
2. Develop verbal communication through presentations, discussions, and debates.
3. Familiarize students with verbal and non-verbal communication techniques.
4. Develop clear, concise, and logical writing skills.
5. Develop skills in questionnaires, surveys, analysis, and visual presentation.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Comprehend and identify key ideas from written and spoken information.

CO2: Demonstrate effective communication through presentations, discussions, and debates.

CO3: Apply appropriate verbal and non-verbal communication techniques.

CO4: Prepare clear, concise, and logical written documents.

CO5: Prepare questionnaires, conduct surveys, analyse data, and present findings visually.

Course Curriculum:

Unit 1	Reading Comprehension	Reading of a passage from famous books. Students to draw an image on A4 paper based on the read passage.
Unit 2	Listening Comprehension	Comprehension of lectures and speeches to locate key points.
Unit 3	Verbal presentations	Understanding the differences among seminars, conferences, convention, congress, debates, extempore speeches, panel discussions etc. Students to make brief oral and visual presentations on selected topics. Importance of gesture, posture and expressions in verbal Presentations.
Unit 4	Analytical / Technical Writing	To develop the ability to write concisely and correctly and present ideas in a logical manner.
Unit 5	Introduction and discussion on exploratory topic for a survey questionnaire	To document a setting and to prepare a fifteen-point questionnaire with info- graphics and conduct survey.
		Interpretation of materials in true form- questionnaires, application forms, analysis of materials such as texts, reports, technical literature.

Submission /Assignments:

- Sketch file and write-ups and sketches involving the introduced terms.
- PPT presentation on selected topics.

Reference Books:

1. K Jain, A M Sheikh & Pravin S R Bhatia, " Professional Communication Skills", S. Chand Publishing, 2001
2. Jones Leo, "Working in English: Teachers Book", Cambridge University Press, 2001.
3. Marsha J. Ludden, "Effective Communication Skills", Jist Works; 2 editions, 2001
4. Mudambadithaya G.S, "Communicative English for Professional Courses", Sapna Book House, 2002.
5. Taylor, Grant, "English Conversation Practice", McGraw Hill Education; 1 edition, 2001.

C.ARTS AND ART FORMS

Course Objectives

The course aims to:

1. Introduce students to the definition, meaning, and role of art in society.
2. Familiarize students with various forms and classifications of art, including fine, performing, folk, visual, spatial, temporal, and abstract arts.
3. Develop an understanding of the characteristics and methods of different art forms.
4. Explore the relationship between art and architecture in the expression of ideas, forms, and spaces.
5. Develop appreciation of artistic approaches and their application in architectural thinking and visual communication.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Define art and explain its role and significance in society.

CO2: Identify and classify various forms of art based on their characteristics and methods of expression.

CO3: Describe the techniques and approaches used in different art forms to communicate ideas and emotions.

CO4: Analyse the relationship between art and architecture in the exploration of form, space, and ideas.

CO5: Apply an understanding of art forms to develop creative and visual approaches in architectural expression.

Course Curriculum:

Unit 1	Introduction	Definition of Art; role and meaning of art in Society
Unit 2	Various types of arts	Fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art etc.
Unit 3	Relationship of architecture with arts	Proponents of various art forms to display the methods of conveying ideas, exploring form and space, techniques to engage the mind

Submission/Assignment:

- Acts, art works group activity to explain their theme
- File assignment notes
- Ppt presentation and videos to understand concept of art and art form

Reference Books:

1. Abid Husain, "National culture of India", National Book Trust, India, 1994
2. Antony Mason, John T. Spike, "A History of Western Art: from prehistory to the 21st Century", McRae Books, 2007.
3. Arthur Llewellyn Basham, "The Wonder That Was India", Picador; Indian ed edition, 2004
4. Fred S. Kleiner, "Art through the Ages", Cengage Learning; 14th edition, 2012
5. Ilay Cooper, John Gillow, "Arts and Crafts of India", Thames and Hudson, 1996
6. Jasleen Dhamija, "Indian Folk arts and Crafts", 2002
7. Michael Braungart, William Mc Donough, "Cradle to Cradle: remaking the way we make things", North Point Press; 1 edition, 2002
8. Paul Johnson, "Art: A New History", Weidenfeld & Nicolson, 2003
9. Peggy Holroyde, "An ABC of Indian Culture", MapinLit, 2007
10. Yashodhara Dalmia, "Contemporary Indian Art", Marg Publications, 2002

B.ARCH. SEM.II
26 AR2 – 01: ARCHITECTURAL DESIGN- II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	07	07	ISE	ESE	ICA	ESE	
Total	08	08	--	---	100	150	250

Course Objectives

The course aims to:

1. Develop understanding of idea, concept, function, space, form, and structure.
2. Introduce basic design methods such as zoning, circulation, and user analysis.
3. Integrate materials, structure, landscape, and spatial elements in design.
4. Develop freehand sketching and visual representation skills.
5. Develop ability to solve and present design problems within time limits.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Analyse functional and spatial requirements in architectural design.

CO2: Apply basic design methods such as zoning, circulation, and user analysis.

CO3: Integrate materials, structure, landscape, and spatial elements in design.

CO4: Demonstrate freehand sketching and visual representation skills.

CO5: Develop and present architectural solutions within specified time limits.

Course Curriculum:

Unit 1	Major Design Problem	Relationship between idea, concept, space- form and structure and functional requirements; various methods of idea generation with use of form, through study of nature and geometry, music, literature, other art forms.
		Case studies of a single functional, multi-functional and connecting spaces.
		Class activity to understand space planning based on activity, which will involve human activity and movement.
		Concept of zoning, bubble diagram, circulation user analysis and its application in Design methods to represent in drawings.
		Application of material, load bearing and composite technology in design with relation to the shape and form.
		Design solution with use of different elements and spaces in design like landscape, courtyard, formal informal spaces, personal spaces etc.
		Major Design Assignment: The student should be introduced with a design problem with three to four functions of total area up to 150sqm -250sqm. Design development like Residences, Farm houses, Library, Cafeteria, gymnasium etc.
Unit 2	Sketching	Freehand sketching with different media. Preferably outdoor cityscapes, monuments, objects with varying surfaces, volumes using various time modes. (Same object in two minutes to two hours/ outdoor or indoor)
Unit 3	Minor Design Problem	Minor Design Assignment: literature study and analysis Example: The student should be introduced with a design problem with three to four functions of total area up to 75 sqm.

		Kindergarten, Doctor's Clinic, Courtyard spaces, ticket counters, entrance plazas etc
Unit 4	Time Bound Design Problem	Design - 6 hours and one day assignment
		Drawing work of minor design assignment to be completed in time bound

Submission/Assignments:

Sketch file.

Study documentation, reports and data collection in file form/drawing form.

Pre-Design Process Drawings

Design portfolio.

Design Models, study models.

Reference Books:

1. Anthony Di Mari and Nora Yoo, " Operative Design: A Catalogue of Spatial Verbs", BIS Publishers.
2. Bruno Munari, "Design as Art", Penguin UK, 25-Sep-2008
3. Charles George Ramsey and Harold Sleeper, " Architectural Graphic Standards", 1992, Wiley
4. Debkumar Chakrabarti, " Indian Anthropometric Dimensions for Ergonomic Design Practice", 1997
5. Frank Ching, James F. Eckler, "Introduction to Architecture", 2012, John Wiley & Sons, US
6. Frank D.K. Ching, " Architecture: Form, Space, and Order", 4th Edition, Sep. 2014, John Wiley & Sons
7. John Hancock Callender, " Time-Saver Standards for Architectural Design Data", 1982, McGraw-Hill
8. Neufert Architects' Data by Ernst Neufert
9. Francis D.K. Ching –Elements of Architecture
10. Rendering with pen and ink
11. Walter Gropius – Total Architecture
12. Prammar V.S. – Fundamentals in Architecture

26 AR 2- 02: BUILDING CONSTRUCTION AND MATERIAL- II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	05	05	ISE	ESE	ICA	ESE	
Total	06	06	---	100	50	100	250

Course Objectives

The course aims to:

1. Introduce principles and construction techniques of arches, lintels, doors, windows, stairs, and roofs.
2. Develop understanding of building components, their terminology, materials, and construction methods.
3. Familiarize students with cement, lime, mortar, and timber, their properties, types, uses, and tests.
4. Introduce timber products and basic carpentry joints used in building construction.
5. Develop the ability to select appropriate materials and construction techniques for building components.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Explain the principles and types of arches, lintels, doors, windows, stairs, and roofs.
 CO2: Identify building components and describe their construction methods and terminology.
 CO3: Identify types, properties, uses, and tests of cement, lime, and mortar.
 CO4: Explain timber products, their applications, and basic carpentry joints.
 CO5: Select suitable building materials and construction techniques for basic building components.

Course Curriculum:**Building Construction:**

SUPER STRUCTURE		
Unit 1	Introduction to openings- Arches	a. Principles and terminology of arch construction b. Types of arches – based on shape, number of centers, materials used
Unit 2	Introduction to openings- lintels	a. Lintel construction b. Types of lintels using different material
Unit 3	Timber doors	a. Terminology used in door and windows. b. Ledged and battened, ledged, braced and battened door. Ledged, braced and framed door (Introductory) c. Panelled door (with and without glazing), Flush door.
Unit 4	Timber Windows And ventilators	a. Panelled windows. b. Types of ventilators
Unit 5	Vertical movement in buildings	a. Introduction to vertical movement in buildings – ladder, ramp, stairs, lifts, escalators. b. Ramps and Staircase terminology c. Types of staircases based on shapes.
Unit 6	Roof	a. Roof terminology b. Various types of roof profiles -Flat, Pitched, Vaults, Domes.

Building Material:

Unit 1	Cement	a. Introduction to manufacturing process. b. Properties of cement c. Uses of cement d. Types of cement e. Field Tests of cement f. Initial and Final Setting Time.
Unit 2	Lime	a. Sources of lime. b. Introduction to manufacturing process of lime c. Classification of lime d. Uses of lime e. Tests for lime
Unit 3	Mortar	a. Mix, methods of preparation of mortar b. Various types of mortar (Mud mortar, Lime mortars, cement mortar, Sukhi mortar, gypsum mortar) c. Application and uses in building constructions.
Unit 4	Timber	a. Uses & application of timber in building construction b. Market forms of wood - plywood, block boards, hard boards and veneers, and eco- boards. c. Carpentry joints.

Submission /Assignment:

Sheet work on -

1. Types of arches based on shape
2. Types of arches based on center and material used.
3. Types of lintels.
4. Paneled door (with and without glazing), flush door.
5. Timber Paneled windows. Types of ventilators base on different materials and glazing methods
6. Terminology used in staircase, ramps, ladder.
7. Types of staircases based on shape
8. Terminology used in roof.
9. Various types of roof profiles – such as Flat, types of Pitched, Vaults, Domes.

Journal and sketches on building construction and material – Structural analysis of arches, difference between arches and lintels, types of doors based on working operations and materials used, number of panels, Hardware and fixtures used for doors and windows. Introduction to lifts and escalators, difference between flat and pitched roof.

Report – Site Visit and Case Study.

Model -Staircase, Roof, Door, Arches and Lintels.

ESE Weightage: Building Construction 60% and Building Material 40%

Reference Books:

- 1 Barry, R.(1999). The Construction of Buildings Vol. 2. 5th Ed. New Delhi: East-West Press.
2. Foster, J.and Mitchell, S. (1963). Building Construction: Elementary and Advanced, 17th Ed.London: B.T. Batsford
3. McKay, W. B. (2005). Building Construction Metric Vol. I–IV. 4th Ed. Mumbai: Orient Longman.
4. Rangwala,S.C. (1963). Building Construction: Materials and types of Construction. 3rd Ed.NewYork: John Wiley& Sons.
5. Sushil-Kumar, T. B. (2003). Building Construction. 19th Ed. Delhi: Standard Publishers.
6. Rangwala, S. C. (1963). Engineering Materials. 3rd Ed. NewYork: John Wiley and Sons

26 AR2 – 03: THEORY OF STRUCTURE -II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	02	02	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	--	--	ISE	ESE	ICA	ESE	
Total	02	02	30	70	--	--	100

Course Objectives

The course aims to:

1. Introduce concepts of stress, strain, elasticity, and material behaviour.
2. Develop understanding of moment of inertia, centroid, and properties of sections.
3. Develop skills to analyse shear force and bending moment in beams.
4. Introduce bending and shear stresses and their distribution in structural members.
5. Familiarize students with material properties of concrete, structural steel, reinforcement, and soil.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Explain stress, strain, elastic properties, and material behaviour.
 CO2: Calculate moment of inertia, centroid, and section properties of basic and composite sections.
 CO3: Determine shear force and bending moment and draw their diagrams for beams.
 CO4: Calculate and interpret bending and shear stresses in beams.
 CO5: Identify and compare the basic properties of concrete, steel, reinforcement, and soil.

Course Curriculum:

Unit-1	Simple Stress and Strain	Concept of linear stress and strain, Hooke's law and stress-strain diagram for various materials, Lateral strain and Poisson's ratio, Shear stress and modulus of rigidity Volumetric strain and bulk modulus, Relation between various moduli like elastic modulus, modulus of rigidity and bulk modulus, Concept of elastic, plastic and ductile behaviour, Composite materials – modular ratio and equivalent area e.g. RCC column with steel reinforcement
Unit-2	Properties of Section	Concept of moment of inertia, Formula of moment of inertia for rectangular, triangular, circular and semi-circular shapes, hollow rectangular and hollow circular sections, Parallel and Perpendicular Axis theorem, Concept of the radius of gyration and its formula for a rectangular section, Determination of centroidal moment of inertia for composite lamina
Unit-3	Bending Moment and Shear Force	Concept of shear force and bending moment at a section Relation between rate of loading, shear force and bending moment, Shear force and bending moment diagram in case of a simply supported beams, cantilevers, overhanging beam with distributed vertical point loads and moments, Concept of point of contraflexure
Unit-4	Bending Stress in beams	Concept of bending stress, Theory of pure bending, Assumptions made in theory of pure bending, Flexural formula, Concept of moment of resistance, Concept of section modulus, Bending stress distribution across a section
Unit-5	Shear Stress in beams	Concept of shear stress, Shear stress formula, Stress distribution across a rectangular, circular, T, L, I, C sections, Difference between bending stress and shear stress distribution across a section, Relation between average and maximum shear stress
Unit-6	Material Properties	Material Properties of various materials like concrete, Structural steel/ Reinforcement, Soil

Submission/Assignments: Topic-wise assignments

Reference Books: 1) Strength of Materials by Khurmi

2) Strength of Materials by A. P. Dongre

26AR 2 – 04: HISTORY OF ARCHITECTURE -I

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	02	02	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	--	--	ISE	ESE	ICA	ESE	
Total	02	02	30	70	--	--	100

Course Objectives

The course aims to:

1. Introduce students to prehistoric shelters, settlements, burial systems, megaliths, and memorials.
2. Familiarize students with the evolution and characteristics of early Indian architecture.
3. Develop understanding of Egyptian architecture and its major building types and monuments.
4. Introduce West Asiatic, Minoan, and Mycenaean architectural traditions.
5. Familiarize students with Etruscan architecture and its contribution to later architectural development.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Identify and describe major prehistoric shelters, settlements, burial systems, and megalithic structures.
 CO2: Explain the characteristics and development of early Indian architecture.
 CO3: Analyse the major architectural forms and monuments of ancient Egypt.
 CO4: Describe the architectural features of West Asiatic, Minoan, and Mycenaean architecture.
 CO5: Identify and explain the characteristics of Etruscan architecture and its major examples.

Course Curriculum:

Unit 1	Pre- historic shelters, settlements, burial systems, megaliths and memorials	Huts and houses, oval huts near Nice, Houses at Catal Huyuk
		Cromlech & Dolmen tomb at Ireland, Stonehenge at Wiltshire England
		Passage grave & Gallery Graves, at Ireland
Unit 2	Indian Architecture	Mohenjo-Daro City – granary and Great bath
		Vedic architecture- Vedic village, huts and Torana
		Buddhist Architecture- The great Stupa at Sanchi, Viharas at Ajanta, Chaitya Hall at Karli, Stambas- Sarnath pillar
Unit 3	Egyptian architecture	Burial Structure - Mastaba, Pyramid of Cheops at Giza
		Temple - Temple of Khons at Karnak
		Monoliths -Sphinx, obelisk
Unit 4	West Asiatic architecture	Palace Architecture - Assyrian Period- Palace of Sargon at Khorsabad
		Persian Period- Palace of Persepolis
Unit 6	Pre-Greek architecture	Minoan Architecture – Palace of King Minos in Knossos,
		Mycenaean architecture - Palace of Tiryns, Megaron.
Unit 7	Pre-Roman architecture	Etruscan Architecture – Temple of Juno Sospita, Lanuvium.

Submission/Assignment:

Journals with sketches, A3 size sheets with sketches- preferably plans and sections- of various buildings discussed in the above units. Models of examples studied in above theory in group work.

Reference Books:

1. Bannister Fletcher. "History of Architecture", CBS Publishers, 1992
2. Henri Stierlin, "Architecture of the world - Greece", Herron Books 1994, - The Roman Empire", Taschen Pub., 1997, "Architecture of the world - Romanesque", Taschen Pub., 2008.
3. The Great Ages of World Architecture – By G.K. Hiraskar
4. Satish Grover, "Buddhist and Hindu Architecture in India", CBS Publishers and Distributors, 2003
8. History of Fine Arts in India and West

26 AR2- 05: ARCHITECTURAL GRAPHICS AND DRAWING- II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	01	01	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	04	04	30	70	--	--	100

Course Objectives

The course aims to:

1. Introduce orthographic projection of simple, cut, and truncated geometric solids.
2. Develop skills in preparing isometric views of simple and compound solids.
3. Develop understanding of surface development and true shapes of solids.
4. Develop skills in representing complex and compound three-dimensional forms.
5. Introduce isometric and axonometric representation of basic architectural elements.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Prepare orthographic projections of simple, cut, and truncated solids.

CO2: Construct isometric views of simple, cut, and compound solids.

CO3: Develop surfaces and true shapes of simple, cut, and compound forms.

CO4: Represent complex and compound objects in three dimensions.

CO5: Apply isometric and axonometric views to represent basic architectural elements.

Course Curriculum:

Unit 1	Solid Geometry orthographic projections	Introduction to orthographic projection of three-dimensional objects. Orthographic projections of simple geometric solids such as cube, cuboid, prism, pyramid, cylinder, and cone . Projection of solids in different positions. Orthographic projection of cut and truncated solids. Exercises on plans, elevations, and sectional views.
Unit 2	Isometric view	Introduction to isometric projection and isometric views. Isometric views of simple geometric solids. Isometric views of cut and truncated solids. Isometric views of combined and compound solids. Exercises based on plans, elevations, and sections.
Unit 3	Surface development of objects.	Introduction to surface development. Development of surfaces of simple geometric solids. Development of cut and truncated solids. Development of compound and intersecting forms. Exercises on true shapes of cut portions. Application of developed forms in architectural elements.
Unit 4	Three-dimensional development	Representation of basic single story structure focusing on the three-dimensional isometric representation. It covers architectural elements like walls, roofs, staircases, and openings through various line profiles, including straight, curved, inclined, and zigzag lines.

Submission/Assignment:

- Portfolio on Graphical Drawings: Student will prepare drawings using different graphical method, lettering, scales, and symbolic way.
- Student will prepare three-dimensional drawings using different graphical methods given.

Reference Books:

1. Robert W. Gill, Rendering with Pen and Ink

2. The Thames and Handsomeness
3. Francis D. K. Ching “Architectural Graphics” Van Nostrand Reinhold Co. 1985

26 AR2 – 06: BASIC DESIGN AND VISUAL ARTS- II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	03	03	--	--	100	--	100

Course Objectives

The course aims to:

1. Introduce principles of form and spatial organization in architectural design.
2. Develop understanding of spatial, centralized, linear, radial, clustered, and grid organizations.
3. Explore architectural works to understand principles of composition, form, and space making.
4. Develop creativity through the study of experience, memory, imagination, and fantasy in design.
5. Explore sources of design inspiration such as nature, history, materials, climate, geometry, and paradox.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Identify and apply different principles of form and spatial organization.
 CO2: Analyse architectural works based on form, composition, and spatial organization.
 CO3: Apply basic design elements and principles to create and organize architectural spaces.
 CO4: Explore experience, memory, imagination, and fantasy as sources for design ideas.
 CO5: Develop creative design concepts using inspiration from nature, history, materials and geometry.

Course Curriculum:

Unit 1	Articulation of form	Study of organization of form and space- spatial, centralized, linear, radial, clustered and grid organization
Unit 2	Study of architectural works	Study of architectural works to explore the principles of composition and organization of forms Space making through basic elements of design and principles of composition. Space making through principals of spatial organization
Unit 3	Role of experience, memory, fantasy, reality, Imagination in design.	Sources of inspiration such as nature, history, material, climate, geometry, paradox, etc. for creativity.

Submission/Assignment:

Assignments to cover the above topics i.e., two-dimensional compositions, three-dimensional forms and material study

Submission Format:

Models of studio work.
 Compositions made in studio work.
 Documentation and portfolio of studio work.

References Books:

1. Architecture: Form Space and Order – Francis D. K. Ching
2. Design fundamentals in architecture- V. S. Parmar
3. Pattern Language – Christopher Alexander

26 AR 2 – 07: WORKSHOP – II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	03	03	ISE	ESE	ICA	ESE	
Total	03	03	--	--	50	--	50

Course Objectives

The course aims to:

1. Develop model-making skills for basic design and architectural forms.
2. Develop practical skills in making models of buildings, furniture, objects, and interior details.
3. Apply model-making techniques to represent building technology and architectural history studies.
4. Introduce digital fabrication techniques such as laser cutting and 3D printing for architectural models.
5. Develop skills in making site, block, and multi-activity space models.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Construct models of basic, composite, free, and architectural forms.
 CO2: Prepare models of buildings, furniture, everyday objects, and interior details.
 CO3: Apply model-making techniques to represent building technology and architectural history studies.
 CO4: Use laser cutting, 3D printing, and other digital fabrication techniques for model making.
 CO5: Develop block, site, and multi-activity space models showing spatial connections.

Course Curriculum:

Unit 1	Models for basic design and basic architectural design elements. (Composite forms, Free Forms, Architectural forms).
Unit 2	Practical exercises related to making models of simple buildings, furniture and everyday objects And Interior detail models of units.
Unit 3	Models of Building Technology Studio work and History of Architecture assignments.
Unit 4	Laser cutting and 3D printing etc. Making of block models and detail models.
Unit 5	Models of multi activity spaces developing connection between them
Unit 6	Introduction to site model

Submission/ Assignments:

1. Brick bonds model, any historical building in group work.
2. Presentation of Models into sketches, photos and live demo.
3. Model of Architectural design studio work and some of the other subjects
4. In coordination with the Architectural Design, Basic Design and Building Construction and Technology Studios

Reference Books:

1. Arjan Karssen & Bernard Otte, "Model Making: Conceive, Create and Convince", FramePublishers (November 11, 2014)
2. David Neat, "Model-Making: Materials and Methods", CroWood Press, 2008
3. Jocqui Atkin, "250 tips, techniques, and trade secrets for potters", Barron's Educational Series, 2009
4. Matt Driscoll, "Model Making for Architects", The Crowood Press Ltd, 2013
5. Nick Dunn, "Architectural Model Making", Laurence King Publishing, 2014
6. Roark T. Congdon, "Architectural Model Building", Fairchild Books; 1 edition, 2010

26 AR2- 08 ELECTIVE -II

Teaching Scheme Per week		Credit	Examination Scheme				
Lecture/ week - L	--	--	Theory Exam		Practical oral exam		Total
Practical/Studio -P/S	02	02	ISE	ESE	ICA	ESE	
Total	02	02	--	--	50	--	50

The student will opt for any one of the following courses

- A. Furniture design**
- B. Creative writing**
- C. Mud architecture**

The detail syllabus for the above subjects is given hereby

A: FURNITURE DESIGN**Course Objectives**

The course aims to:

1. Introduce the history and evolution of furniture design from traditional to contemporary practices.
2. Familiarize students with major furniture movements, designers, styles, and design approaches.
3. Develop understanding of ergonomics, function, and human requirements in furniture design.
4. Introduce furniture materials, construction methods, design trends, and innovations.
5. Develop awareness of furniture design for different interiors and specially abled users.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Explain the evolution and major developments in furniture design.
- CO2: Identify major furniture styles, movements, and designers.
- CO3: Apply ergonomic and functional principles in furniture design.
- CO4: Select suitable materials and construction methods for furniture design.
- CO5: Develop furniture solutions considering interior requirements, innovation, and accessibility.

Course Curriculum:

Unit 1	Introduction	A brief introduction to history of furniture design and contemporary practices- Indian traditions, Arts and Crafts Movement, Bauhaus, Works by Saarinen, Alto, Rietveld, Charles and Ray Eames, Le Corbusier, Mies van der Rohe, Zaha Hadid.
Unit 2	Aspects of Furniture design	Role of furniture, Ergonomic factors of furniture design
		Design and types of furniture based on its style, characteristics and functional application
		Materials and methods of construction of furniture, design trends, Innovations and ideas of furniture for specific types of interiors.
		Design for the specially abled

Submission/ Assignments:

- Documentation
- File and portfolio of Sketches work.

Reference Books:

1. Time-Saver Standards for Interior Design and Space Planning by Joseph DE Chiara, Julius Panero and Martin Zelnik | Architectural Detailing
2. 1000 Chairs – Peter Fiell and Charlotte Fiell
3. Furniture Design – An Introduction to Development, Material, and Manufacturing – Stuart Lawson

B: CREATIVE WRITING

Course Objectives

The course aims to:

1. Introduce creative writing as a means of expressing architectural ideas, narratives, and experiences.
2. Familiarize students with different genres of writing such as fiction, poetry, travel writing, and blogging.
3. Develop skills in analysing and understanding different writing styles and methods.
4. Develop verbal presentation and discussion skills through readings and writing exercises.
5. Introduce students to architectural writing through interactions with writers and journalists and preparation of a term paper.

Course Outcomes

By the successful completion of the course, the student will be able to:

CO1: Explain the role of creative writing in expressing architectural ideas and experiences.

CO2: Identify and apply techniques of different genres of architectural writing.

CO3: Analyse different writing styles and methods through selected readings.

CO4: Present and discuss architectural ideas effectively through verbal presentations.

CO5: Produce structured architectural writing through genre-based assignments and a term paper.

Course Curriculum:

Unit 1	Introduction	Techniques and methods of expressing an architectural narrative or description through forms of creative writings such as fiction, poetry, travel writing, blogging which are based on architecture or employ Architecture as a context.
Unit 2	Various genres of writing	Presentations on the techniques of writing different genres.
Unit 3	Verbal presentations	Discussions of various readings to familiarize and analyze the Methods and styles of writing.
		Writing assignments related to the genres culminating in a term paper
		Interactions with architectural writers and journalists to share their Experience / perspective.

Submission/ Assignments:

- Documentation
- File and presentation.

Reference Books:

1. The Creative Writing MFA Handbook, by tom Kealey
- 2.. Creative Writing: An Introduction to Poetry and Fiction – by Starkey, David
3. College handbook of creative writing by Robert DeMaria

C: MUD ARCHITECTURE

Course Objectives

The course aims to:

1. Introduce the history and evolution of mud architecture from early civilizations to contemporary practices.
2. Familiarize students with different mud construction forms, materials, and technologies.
3. Develop understanding of the preparation, properties, specifications, and applications of mud construction techniques.
4. Introduce the works and approaches of architects and organizations practicing mud architecture.
5. Develop awareness of sustainable and climate-responsive applications of mud architecture.

Course Outcomes

By the successful completion of the course, the student will be able to:

- CO1: Explain the evolution and significance of mud architecture through different periods.
CO2: Identify different mud construction techniques and their applications.
CO3: Describe the properties, preparation, and specifications of mud construction materials.
CO4: Analyse the works and construction approaches of prominent mud architecture practitioners.
CO5: Apply basic principles of mud construction to develop sustainable architectural solutions.

Course Curriculum:

Unit 1	Introduction	History of mud architecture since river valley civilizations, Middle Ages and contemporary practices.
Unit 2	Different forms and technologies	Cob, Compressed Earth Block, Mud Brick, Rammed Earth, Wattle and Daub, Adobe; preparation, properties, specifications and application with examples.
Unit 3	Works and technologies employed by master architects	Hassan Fathy, Laurie Baker, Revati Kamat, Didi Contractor, Auroville Earth Institute and others

Submission/ Assignments:

- Documentation
- File and portfolio of Sketches work.

Reference Books:

1. Jain, K. and Jain, M. (1992). Mud Architecture of the Indian Desert. Ahmadabad: Aadi Centre
2. Architecture for the poor – Hasan Fathy
3. Natural energy and vernacular architecture, Hassan Fathy
4. K S Jagadish, "Building with Stabilized Mud"; IK International Publishing House PVT Ltd.