MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(An Autonomous Institute Under RGPV, Bhopal)

SEMESTER :First Semester

Branch -ARCHITECTURE, Scheme Name - 2020

S. No.	Subject Code	Subject Name	Maximum Minimum Marks Alloted														MOOC						Credit Allot		Total Credit
			Theory								Practical														
			End Sem		Mid sem		Quiz Ass.		Proficiency in Subject/Course		End Sem		Lab Work		Skill Based Min Project		End Sem		Lab Work		Quiz /Assignment		Theory	Practical	
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max	Min	Max.	Min	Max.	Min	Max.	Min	Max.	Min			
1	210112	Architectural Design I	100	40	20	-	20	-	20	0	50	20	30	-	10	-	-	-	-	-	-	-	5	3	8
2	210113	Building Materials	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
3	210114	Graphics I	50	20	20	-	20	-	10	0	50	20	50	-	-	-	-	-	-	-	-	-	5	1	6
4	210115	Structure I	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
5	210116	History of Architecture I	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
6	210117	Workshop I	-	-	-	-	-	-			20	8	20	-	10	-	-	-	-	-	-	-	0	2	2
7	210118	Professional Communication	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
			350	**140**	**120**	**-**	**120**	**-**	**70**	**0**	**120**	**48**	**100**	**-**	**20**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**6**	**27**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(An Autonomous Institute Under RGPV, Bhopal)

SEMESTER :Second Semester

Branch -ARCHITECTURE, Scheme Name - 2020

S. No.	Subject Code	Subject Name	Maximum Minimum Marks Alloted														MOOC						Credit Allot		Total Credit
			Theory								Practical														
			End Sem		Mid sem		Quiz Ass.		Proficiency in Subject/Course		End Sem		Lab Work		Skill Based Min Project		End Sem		Lab Work		Quiz /Assignment		Theory	Practical	
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max	Min	Max.	Min	Max.	Min	Max.	Min	Max.	Min			
1	210211	Architectural Design II	100	40	20	-	20	-	20	0	50	20	30	-	10	-	-	-	-	-	-	-	5	3	8
2	210212	Building Construction I	50	20	20	-	20	-	10	0	20	8	20	-	10	-	-	-	-	-	-	-	3	3	6
3	210213	Graphics II	50	20	20	-	20	-	10	0	20	8	20	-	10	-	-	-	-	-	-	-	2	1	3
4	210214	Structure II	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
5	210215	History of Architecture II	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
6	210216	Theory of Design	50	20	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
7	210217	Workshop II	-	-	-	-	-	-			20	8	20	-	10	-	-	-	-	-	-	-	0	2	2
			350	**140**	**120**	**-**	**120**	**-**	**70**	**0**	**110**	**44**	**90**	**-**	**40**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**9**	**27**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(An Autonomous Institute Under RGPV, Bhopal)

SEMESTER :Third Semester

Branch -ARCHITECTURE, Scheme Name - 2020

S. No.	Subject Code	Subject Name	Maximum Minimum Marks Alloted														MOOC						Credit Allot		Total Credit
			Theory								Practical														
			End Sem		Mid sem		Quiz Ass.		Proficiency in Subject/Course		End Sem		Lab Work		Skill Based Min Project		End Sem		Lab Work		Quiz /Assignment		Theory	Practical	
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max	Min	Max.	Min	Max.	Min	Max.	Min	Max.	Min			
1	210310	Biology for Architects	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2	210311	Architectural Design III	100	-	20	-	20	-	20	0	50	20	30	-	10	-	-	-	-	-	-	-	4	3	7
3	210312	Building Construction II	50	-	20	-	20	-	10	0	20	8	20	-	10	-	-	-	-	-	-	-	3	3	6
4	210313	Graphics III	-	-	-	-	-	-			20	8	20	-	10	-	-	-	-	-	-	-	0	3	3
5	210314	Surveying & Leveling	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
6	210315	History of Architecture III	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
7	210316	Structure III	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
8	210319	Summer Internship Project I	-	-	-	-	-	-			50	20	-	-	-	-	-	-	-	-	-	-	0	1	1
9	CLC	Novel Engaging Course	-	-	-	-	-	-			-	-	50	-	-	-	-	-	-	-	-	-	0	1	1
			350	**-**	**120**	**-**	**120**	**-**	**70**	**0**	**140**	**56**	**120**	**-**	**30**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**11**	**27**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(An Autonomous Institute Under RGPV, Bhopal)

SEMESTER :Fourth Semester

Branch -ARCHITECTURE, Scheme Name - 2020

S. No.	Subject Code	Subject Name	Maximum Minimum Marks Alloted														MOOC						Credit Allot		Total Credit
			Theory								Practical														
			End Sem		Mid sem		Quiz Ass.		Proficiency in Subject/Course		End Sem		Lab Work		Skill Based Min Project		End Sem		Lab Work		Quiz /Assignment		Theory	Practical	
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max	Min	Max.	Min	Max.	Min	Max.	Min	Max.	Min	Theory	Practical	
1	1000001	Indian Constitution and Traditional Knowledge(Mandatory Audit Course)	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2	210413	Architectural Design IV	100	-	20	-	20	-	20	0	50	20	30	-	10	-	-	-	-	-	-	-	4	3	7
3	210414	Building Construction III	50	-	20	-	20	-	10	0	20	8	20	-	10	-	-	-	-	-	-	-	3	3	6
4	210415	Building Services I (Water Supply & Sanitation)	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
5	210416	History of Architecture IV	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
6	210417	Structure IV	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
7	210419	Tour/Seminar/Workshop/NASA Training during winter break	-	-	-	-	-	-			50	20	-	-	-	-	-	-	-	-	-	-	0	1	1
8	CLC	Novel Engaging Course	-	-	-	-	-	-			-	-	50	-	-	-	-	-	-	-	-	-	0	1	1
9	DE 1	Elective I	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
			400	**-**	**140**	**-**	**140**	**-**	**80**	**0**	**120**	**48**	**100**	**-**	**20**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**19**	**8**	**27**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(An Autonomous Institute Under RGPV, Bhopal)

SEMESTER :Fifth Semester

Branch -ARCHITECTURE, Scheme Name - 2020

S. No.	Subject Code	Subject Name	Maximum Minimum Marks Alloted														MOOC						Credit Allot		Total Credit
			Theory								Practical														
			End Sem		Mid sem		Quiz Ass.		Proficiency in Subject/Course		End Sem		Lab Work		Skill Based Min Project		End Sem		Lab Work		Quiz /Assignment		Theory	Practical	
			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min	Max	Min	Max.	Min	Max.	Min	Max.	Min	Max.	Min			
1	1000005	Disaster Management	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2	210514	Architectural Design V	100	-	20	-	20	-	20	0	50	20	30	-	10	-	-	-	-	-	-	-	5	3	8
3	210515	Building Construction IV	50	-	20	-	20	-	10	0	20	8	20	-	10	-	-	-	-	-	-	-	3	3	6
4	210516	Building Services II (Electrical & Mechanical)	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
5	210517	Building Sciences & Energy Conservation	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
6	210518	Self Study, Seminar (SWAYAM/NPTEL & MOOC)	-	-	-	-	-	-			-	-	100	-	-	-	-	-	-	-	-	-	0	2	2
7	210519	Summer Internship Project - II	-	-	-	-	-	-			50	20	-	-	-	-	-	-	-	-	-	-	0	1	1
8	CLC	Novel Engaging Course	-	-	-	-	-	-			-	-	50	-	-	-	-	-	-	-	-	-	0	1	1
9	dE 2	Elective - II	50	-	20	-	20	-	10	0	-	-	-	-	-	-	-	-	-	-	-	-	3	0	3
			350	**-**	**120**	**-**	**120**	**-**	**70**	**0**	**120**	**48**	**200**	**-**	**20**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**10**	**27**

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous NACC Accredited Institute Affiliated to RGPV, Bhopal)

BACHELOR
OF
ARCHITECTURE

SYLLABUS

(I-X Semester)
Batch 2020 Onwards

DEPARTMENT OF ARCHITECTURE & PLANNING

First Year First Semester

1. Architecture Design – I (Code - 210112)

Objectives –

The course aims to obtain the fundamentals of design – elements and principles that govern the aesthetic aspects of design, experimental understanding of graphic elements and compositions in 2D / 3D, experimental understanding of colours, textures and compositions. Experimental understanding of form building, experimental understanding of design.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210112**	Architectural Design – I	DC-1	100	20	20	20	50	30	10	250	7	2	3	2*(1.5)	**8**	AO	Offline**

UNIT-1 GRAPHIC ELEMENTS, COMPOSITIONS & COLOURS – 2D

Impart elements and principles of design theory with sample exercises supported by illustrative PowerPoint presentations. Exercises: Dots, lines, shapes & forms, hatching patterns, 2D compositions with geometric & organic shapes and Impart colour theory with sample exercises supported by illustrative PowerPoint presentations, colour compositions on 2d compositions, textures replacing colors.

UNIT-2 3-DCOMPOSITIONS / COLOUR & TEXTURE APPLICATIONS

Texture portfolio, 3D compositions with geometric & organic forms (model), Color compositions on 3D compositions (model), Texture applications & material compositions (model)

UNIT-3 2-D & 3-D ABSTRACTIONS

2-D image abstraction (colour, black/white, grey tone/mono colour, textures), 3-D image abstraction (colour, black/white, grey tone/mono colour, texture), 3-D model abstraction (colour)

UNIT-4 FORM BUILDING (MODELS)

Make a vivid PowerPoint presentation / video presentation on form building models with ample samples.

Exercises: 3-D sculpture exercises (additive & subtractive forms – solids & voids), Space frame model using a linear module (space creation), Origami models (space creation + solids & voids), Life scale models (group)

UNIT-5 PRODUCT DESIGN

Make a vivid PowerPoint presentation on product design with emphasis on user, purpose, material & form.

Exercises: Small scale product design, Life scale furniture design (group), 3-D model abstraction (colour).

COs & LOs for Architecture Design – I

Overall Course Outcome: The course aims to obtain the fundamentals of design – elements and principles that govern the aesthetic aspects of design, experimental understanding on graphic elements and compositions in 2D /3D, experimental understanding of colors, textures and compositions. Experimental understanding of form building, experimental understanding of design.

CO1	Students will be able to **develop** graphical understanding of visuals.	LO1	**Illustrate** the elements and composition of Design.
		LO2	**Apply** principle of design/additive & subtractive form (using 2d/ 3d compositions)
		LO3	**Illustrate** the color theory principles using color compositions & texture
		LO4	**Evaluate** the geometric & organic forms (2D & 3D in building)
		LO5	**Develop** analytical thinking towards spatial analyses of visual culture in 2-Dimensions.
CO2	Students will be able to **develop** understanding towards application of color and texture.	LO1	**Illustrate** the elements and composition of design in 3-D.
		LO2	**Apply** principle of design/additive & subtractive form (using 2d/ 3d compositions)
		LO3	**Illustrate** the color theory principles using color compositions & texture
		LO4	**Evaluate** the geometric & organic forms (2D & 3D in building)
		LO5	**Elaborate** analytical thinking towards spatial analyses of visual culture in 3D.
CO3	Students will be able to **illustrate** geometric and organic forms.	LO1	**Identify** the elements and principle of design theory
		LO2	**Associate** various graphical elements
		LO3	**Illustrate** the color theory principles using color compositions & texture
		LO4	**Distinguish** the geometric & organic forms (2D & 3D in building)
		LO5	**Elaborate** analytical thinking towards spatial analyses of visual culture
CO4	Students will be able to **create** building forms through model making.	LO1	**Identify** the elements and principle of design theory
		LO2	**Apply** principle of design/additive & subtractive form (using 2d/ 3d compositions)
		LO3	**Illustrate** the color theory principles using color compositions & texture
		LO4	**Categorize** the geometric & organic forms (2D & 3D in building)
		LO5	**Develop** analytical thinking towards spatial analyses of visual culture
CO5	Students will be able to **design** products with emphasis on user, purpose, material & form.	LO1	**Demonstrate** the elements and principle of design theory
		LO2	**Associate** various graphical elements
		LO3	**Illustrate** the color theory principles using color compositions & texture
		LO4	**Examine** the geometric & organic forms (2D & 3D in building)
		LO5	**Create** analytical thinking towards spatial analyses of visual culture

REFERENCES:

1. Charles Wallschlacgerm& Cynthia Busic-Snyder, Basic Visual Concepts and Principles for Artists, Architects and Designers, McGraw Hill, New York1992.
2. V.S. Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt. Ltd., New Delhi,1973.
3. Francis D.K.Ching - Architecture- Form Space and Order Van No strand Reinhold, Co., (Canada),1979.
4. Elda Fezei, Henry Moore, Hamlyn, London, New York, Sydney, Toronto,1972.
5. Exner. V, Pressel. D, Basics Spatial Design, Birkhanser,2009

Note: Five questions shall be asked. All questions may have equal or varied weightage in end semester exams.

2. Building Materials (Code -210113)

Objectives –

The course aims to obtain various materials and systems, their properties and applications, develop a fundamental understanding of the relationship of materiality to construction systems and techniques, the intrinsic relationship of building materials to structural systems and environmental performance.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210113**	Building Materials	BSAE-1	50	10	20	20	-	-	-	100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 INTRODUCTION TO PRIMARY BUILDING MATERIALS

Historical evolution of building materials and construction methods. Clay and clay products (bricks, tiles), stones, timber, etc.

UNIT-2 BAMBOO & TIMBER

Timber types, qualities, and defects in timber seasoning. Processed materials - plywood, laminates, fiberboards, lightweight boards, panels & timber products. Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo. Termite protection, sewage protection, fire protection materials of special needs.

UNIT-3 CEMENT AND OTHER RELATED MATERIALS.

Composition of cement, properties & various types of cement and their uses. Lime, sand, aggregate & mortar.

Special functional needs and categories of building materials abrasives, adhesives, asbestos, asphalt, bitumen, cork, electrical insulators, fuels, gypsum and heat insulation materials, lubricants, rubber sheets, roof coverings, and solders, sound absorb materials, tar and turpentine.

UNIT-4 GLASS

Classification of glass, types of glass, physical properties and uses of glass in building industries, a special variety of glass and architectural glass.

UNIT-5 PROPRIETARY BUILDING MATERIALS & OTHERS

Proprietary building materials: - Paints, Varnishes, distempers wallpaper, floor coverings, tiles, vinyl's, polyesters, fittings, furnishing materials for interiors & exteriors polymers, plastics resins and advanced surface finishes for interior and exterior. Industrial, agricultural and mineral wastes and their utilization as building materials: Fly ash, blast furnace slag, calcium carbonate, lime kiln rejects, by-product, gypsum, red mud, throw-away packages, rice husk, sawdust, wooden chips, choir waste, wood wool, tailings etc. their application in components of different types of buildings.

Note: Assignments should be in the form of small reports, market surveys, seminars and notes on above- mentioned topics. The works of CBRI, NBO, HUDCO, and other related institutions are referred to and discussed.

COs & LOs for Building Material

Overall Course Outcome: The course aims to obtain various materials and systems, their properties and applications, develop a fundamental understanding of the relationship of materiality to construction systems and techniques, the intrinsic relationship of building materials to structural systems and environmental performance.

CO1	Students will be able to **understand** the use of appropriate materials for building and construction.	LO1	**Learn** about different construction materials
		LO2	**Understand** the composition, properties and uses of various building materials.
		LO3	**Develop** a fundamental understanding it's application in building works.
		LO4	**Analyze** the building materials and its influence on prevailing architectural styles
		LO5	**Integrate** the market survey of different types of material
CO2	Students will be able to **understand** the detailing of building material and its applicability.	LO1	**Learn** Types of timber and it's processed materials.
		LO2	**Illustrate** specific use of materials and ascertain their application
		LO3	**Understand** the defects and treatment in timber seasoning.
		LO4	**Develop** an understanding of techniques used for it's application.
		LO5	**Integrate** the market survey of different types of material
CO3	Student will be able to **select** appropriate building materials based on properties, suitability, and it's application	LO1	**Remember** various types of building materials and their special functional needs.
		LO2	**Understand** their applicability, uses and their limitations
		LO3	**Analyze** their properties for their effective use in building construction works.
		LO4	**finalize** specific building materials for different types of buildings
		LO5	**Integrate** the market survey of different types of material
CO4	Students will be able to **understand** the structural component and glazing methods and how to make fenestrations delicate with it's appropriate usage.	LO1	**Understand** the different types of glass in the building industry.
		LO2	**Identify** suitable types of glass for use in field or Architecture.
		LO3	Develop understanding of its physical properties and varieties in buildings.
		LO4	**Analyze** specific use of glass and it's application techniques.
		LO5	**Integrate** the market survey of different types of material
CO5	Students will be able to **deal** with effective budgeting which will reduce the cost of construction through use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure.	LO1	**Learn** Low cost Construction Techniques.
		LO2	**Analyze** building materials and its influence on prevailing architectural styles
		LO3	**finalize** specific building materials for different types of buildings
		LO4	**Consider** local material and its application techniques for low cost construction
		LO5	**Integrate** the market survey of different types of material

TEXT BOOKS:

1. S.C. RANGWALA, " Engineering Materials" Published2012
2. S.P. ARORA & BINDRA, "Building Construction" Published Dec2010

REFERENCE BOOKS:

1. Advances in Building Materials and Construction,CBRI.
2. Specification Yearbook

3. Graphics – I (Code –210114)

Objectives –

The course aims to obtain presentation skills, visual expression and representation, imaginative thinking and creativity through a hands on working with various mediums and materials, grammar of art by involving them in a series of free hand exercises both indoor and outdoor to understand form, proportion, scale, etc., exercises that look at graphic and abstract representations of art, concepts and fundamentals of Architectural Drawing, language of architecture & buildings as two dimensional and three dimensional representations.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210114**	Graphics – I	DC- 2	50	10	20	20	50	50	-	200	7	2	3	2	**6**	AO	Blended ** (4/2)

UNIT-1 INTRODUCTION TO DRAWING

- Introduction to drawing instruments and their use
- Lettering and Dimensioning: Introduction to architectural lettering, styles, proportion and scale, Methods of dimensioning
- Lines: different types of lines, their thickness and applications in architectural drawing.
- Scale: Architectural Metric scale, necessity of scaled drawing, selection of scale while preparing architectural drawing.

UNIT-2 GEOMETRICAL DRAWING & ORTHOGRAPHIC PROJECTION

- Introduction to plane geometry: Construction and development of planar surface–square, rectangle, polygon etc.
- Construction of conic sections: Ellipse, parabola and hyperbola
- Introduction to orthographic projection: Representation of geometric solids in terms of plan, elevation and side elevation in first angle projection – exercise on simple solids.
- Conversion of solids to orthographic projection and vice versa.

UNIT-3 ISOMETRIC VIEW & AXONOMETRIC VIEW

- Isometric view: Isometric view of solids, Isometric application in building–buildings with different shape and different types of roofs to include pitched roof, hipped roof, flat roof, vault, cone, dome etc

UNIT-4 BUILDING ELEMENTS AND BUILDING COMPONENTS

- Building Elements: Techniques of representing building elements such as doors, windows, steps, chajja, porch, canopy, balcony, parapet, foundation, walls, roofs, column, staircase, difference of levels, furniture fittings such as hand wash basins, WC pans, traps etc. on drawings in plan, elevation and section.
- Material Indications: Symbolic representation of building materials as specified by Indian Standard Code of practice.
- Building components: Components of a simple residential building.

UNIT-5 ISOMETRIC VIEW & AXONOMETRIC VIEW OF BUILDINGS

- Isometric view: Exterior view of a simple residential building showing all building components.
- Axonometric view: Axonometric view of a room interior showing all interior components.

COs & LOs for Graphics I			
Overall Course Outcome: Students will be able to develop, draw simple and complex objects in various types of views and will be able to visualize and draw buildings in different views.			
CO1	Students will be able to **draw** the elements of design and apply them in their drawings.	LO1	**Learn** various drawing instruments and their use.
		LO2	**Understand** the lettering and dimensioning technique.
		LO3	**Apply** the techniques by using lines type, letters, dimensioning and scale in drawing.
		LO4	**Analyze** the necessity of scaled proportionate and properly illustrated drawing.
		LO5	**Draw** compositions using all elements**.**
CO2	Students will be able to **draw** planar surface / conic sections in orthographic projections.	LO1	**Study** the construction and development of planar surfaces, conic and orthographic projection.
		LO2	**Understand** use of planar surfaces, conic and orthographic projection.
		LO3	**Construct** various geometrical shapes.
		LO4	**Interpret** and visualization of geometrical shapes in different views & angles.
		LO5	**Draw** compositions showcasing various objects in conic sections, orthographic projections.
CO3	Students will be able to **draw** solids and building elements in isometric projection.	LO1	**Study** the construction and development of solids and building roof elements.
		LO2	**Understand** the isometric projections.
		LO3	**Develop** solids and building roof elements in isometric projection.
		LO4	**Visualization** of geometric solids and building roof elements.
		LO5	**Draw** compositions of geometric solids and building roof elements in isometric projections.
CO4	Students will be able to **draw** plans, elevations and sections.	LO1	**Learn** various building elements, components and materials.
		LO2	**Understand** use of building elements, components and materials
		LO3	**Illustrate** the representation techniques of building elements, components and materials.
		LO4	**Analyze** all representations and symbols in buildings.
		LO5	**Draw** plans, elevations and sections using all building elements, components and materials.
CO5	Students will be able to **draw** interior and exterior views.	LO1	**Learn** about axonometric and isometric views of complex objects.
		LO2	**Understand** use of axonometric and isometric views for exteriors and interiors of buildings.
		LO3	**Illustrate** interiors, exterior elements.
		LO4	**Draw an isometric** view of the exterior of the building using all building components.
		LO5	**Draw an axonometric** view of interiors of rooms using building components.

REFERENCES:

1. K. Venugopalet al., “Engineering Drawing + AutoCAD”, New Age International Publishers,2010.
2. Francis D.K Ching, “Architectural Graphics- Fifth Edition”, John Wiley and Sons, NewJersey,2009.
3. N.D. Bhatt et al., “Engineering Drawing” (53rd Edition), Charotar Publishing House, Anand,India,2014.
4. Morris et al., “Geometrical Drawing for Art Students”, Universities press, 2012.
5. Leslie Martin C., “Architectural Graphics”, The Macmillan Company, New York,1978.

Note: Four questions shall be asked. First question will contain 20 marks & will be compulsory. Other three questions will be of equal marks and one question may have options.

4. **Structure – I (Code –210115)**

Objectives –

The course aims to obtain understanding the basic knowledge & overview of structural systems used in buildings, historical development of structural form and the evolution of structural design knowledge, from Gothic cathedrals to long span structural systems, principles of structural mechanics & how bending moment and shear force diagrams are used to analyze simple structural behavior.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210115**	Structure I	BSAE-2	50	10	20	20	-	-	-	100	3	2	1	-	**3**	PP	Offline***

UNIT-1FORCE & EQUILIBRIUM

Statics of a particle, composition and resolution of forces, moment of a force, parallel forces, couples, general conditions of equilibrium.

UNIT-2 GRAVITY AND MOMENT OF INERTIA

Center of gravity and moment of inertia of composition and cut out sections, parallel and Perpendicular axes theorem, stability of equilibrium.

UNIT-3 STRESS & STRAIN

Simple stresses and strains, direct stresses, compound stresses.

UNIT-4 LOADS

Shear force and bending moments for strained beams subjected to concentrated load and Distributed loadings (Simply supported and cantilever only) support reactions.

UNIT-5 STRESS IN BEAMS

Stress in beams: Direct, bending and shearing stress in beams.

Note: Assignment work should include design and analysis of simple elements as stated above with drawings.

COs & LOs for Structure - I Overall Course Outcome: Students will be able to analyze simple structural behaviour using principles of structural mechanics, bending moment and shear force diagrams.			
CO1	Students will be able to **understand** the behaviour of forces and various principles of strength of materials.	LO1	**Learn** statics of a particle, composition and resolution of forces, moment of a force, parallel forces, couples, general conditions of equilibrium.
		LO2	**Understand** the composition, resolution and types of forces, general conditions of equilibrium.
CO2	Students will be able to **understand** relationship between the bending to the material property and geometry	LO1	**Learn** centre of gravity and moment of inertia of composition and cut out sections.
		LO2	**Understand** parallel and Perpendicular axes theorem, stability of equilibrium
CO3	Students will be able to **calculate** stresses and strains.	LO1	**Learn** simple stress and strain.
		LO2	**Understand** direct and compound stress.
		LO3	**Calculate** direct and compound stress and strain
CO4	Students will be able to **apply** shear force and bending moments for strained beams subjected to concentrated load and Distributed loadings.	LO1	**Learn** shear force and bending moment.
		LO2	**Understand** Shear force and bending moments subjected to concentrated load.
		LO3	**Apply** shear force and bending moments for strained beams subjected to concentrated load and Distributed loadings (Simply supported and cantilever only) support reactions.
CO5	Students will be able to **calculate** the level of stress in beams.	LO1	**Learn** various stresses in beam.
		LO2	**Understand** direct, bending and shearing stress in beams.
		LO3	**Calculate** the various levels of stress in beams.

TEXT BOOKS:

1. S.B. JUNNARKAR, “AppliedMechanics”2015
2. RAMAMURTHAM, “AppliedMechanics”2010
3. S.B. JUNNARKAR/H.J. SHAH, “Mechanics of Structure Vol.1” : 32nd Edition :2016
4. DR. B.C. PUNAMIA, “Strength of Materials”2018

REFERENCE BOOKS:

IS Codes

1. IS 465:2000
2. SP-16 3
3. SP-34

5. History of Architecture- I (Code –210116)

Objectives –

The course aims to obtain knowledge of evolution with regarding to Indian architecture, in India as this is an integrated expression of art, culture, vernacular material and techniques of the place, designs that are rooted in this country and suitable to the lifestyle of its people, varied culture and the resulting architectural productions which are unique in time and place.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210116**	History of Architecture- I	DC- 3	50	10	20	20	-	-	-	100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1RIVER VALLEY CIVILIZATIONS OF INDIA

Prehistoric civilization, Neolithic & Paleolithic. Indus Valley Civilization: culture and pattern of settlement. Vedic culture - Vedic village and rudimentary forms of bamboo and wooden construction - Aryan civilization - origin of earlyHinduism.

UNIT-2 BUDDHIST ARCHITECTURE

Origins of Buddhism and Jainism, Evolution of Buddhist Architecture and its salient features- Examples – Ashokan Pillar at Sarnath and Sanchi stupa. Chaitya hall and Vihara - Buddhist rock cut architecture Examples - Chaitya hall at Karli, Viharas at Nasik.

UNIT-3 EGYPTIAN ARCHITECTURE

Study of the influences & architectural character of ancient Egypt with relevant examples of Tomb & Temple structures (Cult and Mortuary temples), Mastaba – development and typical components of Pyramids – Complex of Zoser, Pyramid of Cheops and Cephren.

UNIT-4 WEST ASIATIC ARCHITECTURE

Study of Mesopotamian architecture, Urbanization in the Fertile Crescent – Sumerian, Babylonian, Assyrian and Persian (with examples of Ziggurat, Sargon palace & Palace of Persepolis). Mayan Civilization- Ceremonial platforms, palaces, pyramids and temples.

UNIT-5 INTRODUCTION TO SOUTH EAST ASIAN AND EAST ASIAN ARCHITECTURE

StudyofprominentarchitecturalcharacterofsouthAsiancountries.StudyofrelevantexampleslikeAngkorwat Cambodia. Introduction to Chinese architecture and typical examples of Pagoda, Pylons, Great Wall of China, temples, etc. Introduction to Japanese architecture, its characteristic features and typical examples: Pagoda, temples, monasteries, tea houses etc.

COs & LOs for HOA – I			
Overall Course Outcome: Students will be able to **develop** an appreciation of varied cultures and the resulting architectural productions that are unique in time and place & suitable to the lifestyle of its people.			
CO1	Students will be able to **apply** concepts and architectural expressions in their own design.	LO1	**Remember** basic concepts regarding the historical and architectural development in ancient civilization.
		LO2	**Observe** diverse artistic and architectural expressions with regard to the ancient civilizations.
		LO3	**Illustrate** visual and verbal vocabularies of architecture of ancient civilizations.
		LO4	**Evaluate** architectural forms and space with reference to architecture of ancient civilizations,
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of ancient civilizations.
CO2	Students will be able to **apply** elements of Buddhist architecture in their own design.	LO1	**Understand** basic concepts regarding the historical and architectural development in buildings in Buddhist Architecture.
		LO2	**Identify** diverse artistic and architectural expressions with regard to the Buddhist Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Buddhist Architecture.
		LO4	**Analyse** architectural forms and space with reference to Buddhist Architecture,
		LO5	**Replicate** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Buddhist Architecture.
CO3	Studying this, students will be able to **apply** elements of Egyptian architecture in their own design.	LO1	**Understand** the architectural characters of the Ancient Egyptian buildings.
		LO2	**Identify** development and typical components of Egyptian pyramids.
		LO3	**Illustrate** visual and verbal vocabularies of Egyptian Architecture.
		LO4	**Analyze** architectural forms and space with reference to Tomb, Mastaba, Temples, etc. in Egyptian architecture.
		LO5	**Replicate** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Egyptian Architecture.
CO4	Studying this, students will be able to **apply** elements and concepts of West Asiatic Architecture in their own design.	LO1	**Remember** basic concepts regarding the historical and architectural development in ancient civilization of Mesopotamian, Sumerian, Babylonian, Assyrian & Persian.
		LO2	**Identify** diverse artistic and architectural expressions with regard to these civilizations
		LO3	**Illustrate** visual and verbal vocabularies of each of Ziggurats, Palaces, Temples, Ceremonial platforms, Pyramids, etc.
		LO4	**Analyse** architectural forms and space with reference to West Asiatic Architecture.
		LO5	**Replicate** with help of sketches, visuals (softwares) and 3D (models) of various architectural forms and styles of West Asiatic Architecture.
CO5	Studying this, students will be able to **apply** elements of South East & East Asian architecture in their own design.	LO1	**Understand** basic concepts regarding the historical and architectural development in buildings in South East & East Asian Architecture.
		LO2	**Identify** prominent architectural character of the South East & East Asian Architecture with help of typical examples of Pagoda, Pylons, Temples, Monasteries, etc.
		LO3	**Illustrate** visual and verbal vocabularies of South East & East Asian Architecture.
		LO4	**Analyse** architectural forms and space with reference to South East & East Asian Architecture.
		LO5	**Replicate** with help of sketches, visuals (softwares) and 3D (models) of various architectural forms and styles of South East & East Asian Architecture.

TEXT BOOKS:

1. SATISH GROVER, "The Architecture of Indian (Buddhist &Hindu)"
2. A VOLWANSEN, "Living Architecture (Indian)", Oxford & IBHLondon
3. Pier LuigiNervi, General Editor, "History of World Architecture –Series"

REFERENCE BOOKS:

1. PERCY BROWN, "Indian Architecture (Buddhist & Hindu), Taraporewala & Sons, Bombay. 2ndEdition
2. CHRISTOPHERTADGILL, "History of Architecture in India", Phaidon Press.
3. History Of Architecture by Sir Bannister Fletcher 20thedition
4. The Story Of Architecture by Patrick Nuttgens 2ndEdition
5. Space, Time And Architecture by Siegfried Gideon 5th Edition

6. Workshop – I (Code –210117)

Objectives –

The course aims to obtain the ability to appreciate the three dimensional implications of design and to introduce the students to the techniques of model making, basics of rendering, presentation skills & model making with various materials.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	**210117**	Workshop – I	SEC -1	-		-	-	20	20	10	50	4	-	-	4	**2**	SO	Offline**

UNIT-1 VISUAL ART

General characteristics of visual art/Fundamentals of visual art: Space, Form, size, Shape, Line, Color, Tone values, Perspective, Design and aesthetic organization of Visual elements in art object (Composition).The use of two and three dimensions in visual art. Tactile quality in art. Environment and art. Perceptual and conceptual aspects in art. Use of various kinds of papers in art making.

Exercise: Art Installation using above techniques.

UNIT-2 CARPENTRY & FOUNDRY

Introduction to the carpentry tools, processes, joints and wood working machines. Preparation of various carpentry joints, fixing of plywood, Blackboards, commercial boards and their application in furniture. Models in appropriate materials for understanding of joinery in wooden construction. Introduction, type of patterns, pattern making, preparation of moulds and moulding equipment details.

Exercise: Construction of Joints and basic Furniture.

UNIT-3 DEVELOPMENT OF SURFACES

Development of simple and composite forms using paper, Thermocol, wire, Wax, acrylic, sheets and similar materials. Introduction to metallic sections, joinery tools, joinery processes and working with them. Bonds in masonry based on the programme of building construction to make the various forms of masonry structures. Mixing of concrete, preparation of various objects.

Exercise: Surface development examples using different materials and creating joints in masonry structures using above techniques.

UNIT-4 FABRICATION

Introduction to welding equipment, processes and its applications.

Exercise: Create an Art installation from metal pieces by welding them.

UNIT-5 PAINTING & POLISHING

Classification of paints, varnishes ingredients of paints, painting methods-brush, spray, hot spray etc.

Exercise: Murals and wall paintings using above techniques.

COs & LOs for Workshop I			
Overall Course Outcome: Students will be able to develop, draw simple and complex models in various materials using different techniques.			
CO1	Students will be able to **create** visual art installations.	LO1	**Learn** various visual art typologies and kinds of paper in art making.
		LO2	**Understand** the fundamentals of visual art.
		LO3	**Analyse** the perceptual and conceptual aspects of visual art
		LO4	**Compose** an art installation using the above knowledge.
CO2	Students will be able to **Construct** various joints and models in different materials.	LO1	**Learn** the tools, joints and machineries used in carpentry.
		LO2	**Understand** different materials and their appropriate use.
		LO3	**Construct** various joints and models in wood, ply board, etc.
CO3	Students will be able to **build** moulds and joints for model making.	LO1	**Learn**various patterns in foundry.
		LO2	**Understand** the pattern making, moulding and making moulds.
		LO3	**Build** a mould and foundry joints using different materials.
CO4	Students will be able to **construct** models out of metal.	LO1	**Learn**about welding and its process.
		LO2	**Understand**the welding equipment and their application.
		LO3	**Weld** a model or an abstract using the different processes and equipment.
CO5	Students will be able to **draw** murals and paint.	LO1	**Learn** about various types of paints and ingredients in paints.
		LO2	**Understand** use of varnishes, etc. and methods of painting.
		LO3	**Draw** murals with the use of various paints, varnishes, and methods of painting.
		LO4	**Integrate** the above learned materials and techniques in creating their design models in further studies

REFERENCES:

1. BENN, the book of the house ,Errnest Benn limited London
2. Jannsen, Constructional Drawings & Architectural models, Kari Kramer Verlag Stuttgart,1973.
3. Harry W.Smith, The art of making furniture in miniature, E.P.Duttor Inc., New York,1982.
4. Thames and Hudson Manual of Rendering with Pen and Ink-Robert WGill.

7. Professional Communication (Code – 210117)

Objectives –

The course aims to obtain communication skills in English by developing their listening, speaking, reading and writing skills, speaking skills with specific reference to prospective/actual clients, suppliers, business partners and colleagues, reading ability of journals, research articles etc & develop their writing skills especially writing project proposals and reports.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	**210118**	Professional Communication	SEC -2	50	10	20	20	-	-	-	100	2	1	1	-	**2**	PP	Blended * (1/1)

Unit -1 Introduction to Language & Linguistics

An Introduction to Linguistics, IPA, English Phonetic Symbols/Sign & Sounds, Place & Manner of Articulation.

Unit -2 Communication

Communication: Approaches, Elements, Types, Process, Models; Management Communication (Levels of Communication) and Grapevine Communication, Verbal and Nonverbal Communication; Barriers to Communication; Johari Communication Window.

Unit-3 Application of Linguistic Ability

1. Listening: Factors Affecting Listening and ImprovingListening.
2. Speaking: Making Speeches, Presentation, Group Discussion, Meeting, Interview,Debate.

Unit-4 Grammar & Vocabulary:

Grammar: Parts of Speech, Subject-verb Agreement, Active and Passive Voice, conditional sentences. Vocabulary: Using the dictionary and thesaurus, word formation, prefix & suffix, idioms, phrasal verbs.

Unit-5 Report Writing:

Reading Comprehension: Stories, Passages, Poetry and Scientific Text

Writing: Essentials of good writing, Technical Descriptions of Simple Engineering Objects; Formal (Application, Email, CV, Résumé, Memo, Report writing)

*****Materialforstoryandproseistobeselectedbyconcernedteacherinclass.

COs & LOs for Professional Communication			
Overall Course Outcome: Students will be able to develop the ability to write and communicate professionally in the language			
CO1	Students will be able to **speak** effectively.	LO1	**Learn** linguistics, IPA and English phonetics, etc.
		LO2	**Understand** the place and manner of articulation.
		LO3	**Analyse** the perceptual and conceptual aspects of speaking.
		LO4	**Speak** clearly, effectively and appropriately in a public forum to a variety of audiences and purposes
		LO5	**Prepare and deliver** oral presentations and arguments acceptable within the Engineering Profession Effectively
CO2	Students will be able to **communicate their** design and ideas.	LO1	**Learn** the communication approaches, elements, types and process.
		LO2	**Study Various** types of communication.
		LO3	**Practice Various** communication types and skills in life.
		LO4	**Demonstrate** knowledge and comprehension of major text and traditions in language as well as its social, cultural and historic context
CO3	Students will be able to learn the techniques to speak publically.	LO1	**Learn** various factors affecting listening.
		LO2	**Comprehend** to improve listening.
		LO3	**Learn** to make speeches and presentations.
		LO4	**Apply** the qualities and techniques learnt to make speeches, debate, interviews, etc.
		LO5	**Read** a variety of text critically and analytically so as to demonstrate in writing and / or speech the interpretations of those texts
CO4	Students will be able to **construct** models out of metal.	LO1	**Learn Various** grammatical aspects of writing and speaking the language.
		LO2	**Expand** the vocabulary.
		LO3	**Practice To** use the techniques in explaining Design.
		LO4	**Interpret** text written in English assessing the result in written and oral arguments using appropriate material for support
CO5	Students will be able to **write** reports explaining their design and later on papers.	LO1	**Learn** about report writing and its process.
		LO2	**Understand** the techniques and essentials of report writing.
		LO3	**Draft**Formal Application, mail, CV, Résumé, Memo, Report for design, etc.
		LO4	**Implement** professional work habits, including those necessary for effective collaboration and cooperation with others

Books: -

1. Technical Communication —- By Meenakshi Raman, OUP.2015
2. Understanding Human Communication — By Ronald Alderman byOUP2016
3. Communication Skills for Engineers – PearsonEducation.
4. Effective Business communication – Tata McGraw Hill2008
5. Business Communication – OUP, Tata McGraw.2005
6. Practical English Grammar by Thomson Martinet – Oxford University Press1986
7. A Handbook of Language laboratory by Cambridge UniversityPress.2009

First Year Second Semester

1. Architecture Design – II (Code – 210211)

Objective –

The course aims to obtain or learn the basic principles of space making, the forms of building through intensive design studio practice.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210211**	Architectural Design – II	DC- 4	100	20	20	20	50	30	10	250	7	2	3	2*(1.5)	**8**	AO	Offline**

PROCESS:

- Fragment the pre design process and help students build formats/templates for analysis. Guide to derive architectural design data through various studies
- Guide to program and to understand the causes for architectural spaces Guide to understand context & its influences
- Guide to learn and experiment the design process
- Guide to conceptualize the design/evolution of architecture Guide to document the design project

Note: Minimum four design problems shall be introduced in the semester out of which, one major problem, one small problem and two shall be time bound problems**.** Learning the basic principles of space making and form building through intensive design studio practice.

PROJECT 1(Prototype): SINGLE SPACE DESIGN

Enlighten the student on the design project overview & the design process to be followed through relevant presentations. Present an analytical discourse on an identical architectural design project covering

a) Architectural elements & relevant architectural terms
b) Space planning (response to user & purpose with logic & application of standards)
c) Material, form & structure
d) Aesthetics & visual perceptions

PROJECT 2(Prototype): SMALL SCALE MULTI-SPACE DESIGN

Enlighten the student on the design project overview & the design process to be followed through relevant presentations. Present an analytical discourse on an identical architectural design project covering

a) Architectural, elements, spaces & terms
b) Noted projects & architects
c) Space planning (response to user & purpose with logic & application of standards)
d) Site planning (contextual response, response to the natural environment, response to views + general site planning guidelines)
e) Material, form & structure
f) Aesthetics & visual perceptions.

PROJECT 3 & 4(Prototype): Time bound Problems of 6 hours to 48 hours.

COs & LOs for Architecture Design – II

Overall Course Outcome: The course aims to obtain or learn the basic principles of space making, the forms of building through intensive design studio practice.

CO1	Students will be able to **discover** Architectural elements & relevant architectural terms in response to Space planning and Understanding the Material, form & structure as well as Aesthetics & visual perceptions.	LO1	**Interpret** architectural design fundamentals (Relationship between people to build forms &built forms to environment)
		LO2	**Summarize** different functional spaces and their space requirements
		LO3	**Identify** human standards of design based on ergonomics
		LO4	**Analyze** pre-design process, design process & conceptualization stages in design
		LO5	**Design** objects based on the concept of space and form by modifying and evaluating an existing space. **Express** their designs through communication skills – verbal, script & graphics.
CO2	Students will be able to **design** project overview & the design process to be followed through relevant presentations with appropriate use of Architectural, elements, spaces &terms by understanding noted projects & architects **a**s well as Space planning.	LO1	**Interpret** architectural design fundamentals (Relationship between people to build forms &built forms to environment)
		LO2	**Summarize** different functional spaces and their space requirements
		LO3	**Identify** human standards of design based on ergonomics
		LO4	**Analyze** pre-design process, design process & conceptualization stages in design
		LO5	**Design** objects based on the concept of space and form by modifying and evaluating an existing space.
CO3	As a result of completing Time bound Problems of 6 hours to 48 hours students will be able to maximize the potential of designing within the time frame.	LO1	**Understand** the application of the architectural design process for small scale projects of human habitat
		LO2	**Transform** the human behavioural needs into architectural program requirements
		LO3	**Analyse** the information on context and the human-space relationship
		LO4	**Compose** the architectural spaces in a design project in a given time frame.
		LO5	**Communicate** architectural drawings with the help of various mediums in given time frame

REFERENCES:

1. Mike W.Lin, Drawing & Designing with confidence – A step by step guide, John Wiley &sons,USA,1998
2. Criss B.Mills, Designing with models : A Studio guide to making & using architectural models, Thomson & Wadsworth, USA,2000. 1st Edition
3. DeChiara and Callender, Time saver standards for building types, McGraw hill company 1990
4. Bousmaha Baiche& Nicholas Walliman, Neufert Architect's data, Blackwell science ltd. 3rd Revised editio
5. Ramsey / Sleeper, National Architectural graphic standards, The American Institute of Architects 12th Edition (AGS 12e) , 2016
6. Space Planning Basics - Mark Karlen2016

Note: Two small design problems shall be given in the End Semester Examination. 6 hours examination.

2. Building Construction – I (Code – 210212)

Objective –

The course aims to obtain knowledge of basic building components and doors, windows, different types of materials and their use in construction, the different materials & technology available & their application, the various types of roofing and its materials.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210212**	Building Construction -I	BSAE- 3	50	10	20	20	20	20	10	150	5	2	1	2*(1.5)	**6**	PP	Blended** (3/3)

UNIT-1 LOW-COST CONSTRUCTION

- Introduction to Low-cost construction techniques and materials with combinations of mud and terra – cotta.
- Foundation and walls in stabilized mud-rammed earth and compact earth blocks

UNIT-2 INTRODUCTION OF BASIC BUILDING COMPONENTS

- Cross-section of a G+1 building to understand foundation, plinth beam, flooring, sill, lintel, slabs, parapet & weathering course
- Foundation: typical types of foundation in stone, brick & RCC. Timbering of trenches, tools, plants, and equipment for excavation.

UNIT-3 WALL

- Walls: Types of bricks and stone and their uses.
- Brick: definition, and types of bond: English, Flemish & rat trap bond for one brick and half thick wall for corners and T-Junctions, Garden wall bond & ornamental bond.
- Stone: Types of stone masonry (random rubble and ashlar).
- Piers and Quoins.

UNIT -4 INTRODUCTION TO OPENINGS

- Doors: Braced, panel, flush doors, carved entrance doors, and partially glazed doors.
- Windows: Casement window, bay window, and French window.
- Ventilators: Louvered Top hung ventilator.
- Arches in brick and stone: flat, segmental, semi-circular and pointed, plastering and pointing.
- Lintels and sills: In brick and stone.

UNIT-5 ROOFS

- Simple configurations and details of various forms of roofs: Flat, sloped, pyramids and dome.

COs & LOs for Building Construction – I

Overall Course Outcome: The course aims to obtain knowledge of basic building components and doors, windows, different types of materials and their use in construction, the different materials & technology available & their application, the various types of roofing and its materials.

CO1	Students will be able to **deal** with effective budgeting which will reduce the cost of construction through use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure.	LO1	**Learn** Low cost Construction Techniques.
		LO2	**Understand** the material and construction techniques through site visit and market surveys
		LO3	**Develop** a fundamental understanding of the relationship of materiality to construction systems and techniques
		LO4	**Analyze** The detail of materials with different combinations in buildings.
		LO5	**Produce** construction detail of foundation and walls in mud-rammed earth and compact earth blocks.
CO2	Students will be able to **depict** materials and see the parts of buildings that are not seen otherwise.	LO1	**Learn** the Building cross section to understand various components in sub- structure and super- structure.
		LO2	**Understand** the need of various components in building.
		LO3	**Develop** a fundamental understanding of types of foundation in a building with different materials.
		LO4	**Analyze** the details of foundation with respect to soil type.
		LO5	**Produce** details of foundations in Stone, Brick and RCC.
CO3	Students will be able to **understand** the importance of walls in building, how they give security, divide available space of building to fulfil basic requirements and also safeguard humans from heat and cold.	LO1	**Learn** types of bricks and stones and their uses in building.
		LO2	**Understand** the difference between various types of bonds.
		LO3	**Analyze** types of stone masonry.
		LO4	**Understand** the details of piers and quoins
		LO5	**Produce** construction details of walls and piers.
CO4	Students will be able to **choose** the appropriate building components with material suitability in his/her designs.	LO1	**Understand** the different types of doors, windows, ventilators, arches etc.
		LO2	**Identify** suitable material required for the construction of doors, windows, ventilator, arches etc.
		LO3	**Classify** the components based on their arrangements, method or manner of construction, working operations and material.
		LO4	**Analyze** the differences between the types of door, windows, etc.
		LO5	**Produce** the drawings of types of doors, windows, ventilators, etc
CO5	Students will be able to **use a suitable** roof for their projects.	LO1	**Understand** Various forms of roofs
		LO2	**Identify** Types of roofs which include flat, sloped, pyramids, and domes
		LO3	**Analyze** the difference between the types of roofs.
		LO4	**Produce** the drawings of types of roofs.

REFERENCES:

1. W.B. Mckay – Building construction Vol. 1 (5th edition), Vol. 2 (4th edition) and Vol. 3 (5th edition). ***Fifth edition*** (2013)
2. S.C.Rangwala – Engineering materials (Fortieth edition, 2013) – Charotar Publishing pvt.ltd. ***40th*** Revised and Enlarged : ***2013***
3. Harold B.Olin, John L. Schmidt – Construction principles, Materials and Methods – John Wiley & Sons, Inc. 1995
4. Dr. B.C Punmia – Building construction (10th edition) - Laxmi Publications.
5. Roy Chudley (Author), Roger Greeno (Author) -construction Technology, 4th Edition. 1995
6. S.K. Duggal- Building materials (4th edition) – New age international publishers. 4th revised edition 2012
7. Bureau of Indian standards - Handbook on Masonry Design and Construction (First Revision). 1991

8. Hans Bans –Building construction details practical drawing, 2001.

Note: Total five questions shall be asked. Each question will consist of two parts, one of which will be of 7 marks (which shall be compulsory) and another with 3 marks (which shall be optional).

3. Graphics – II (Code – 210213)

Objectives –

The course aims to obtain the skill of representation in advanced drawing techniques, perspective, sciography and Measured Drawing.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210213**	Graphics – II	DC- 5	50	10	20	20	20	20	10	150	4	1	1	2	**3**	AO	Offline**

UNIT-1 ELEMENTS AND PRINCIPLES OF PERSPECTIVE DRAWING

- Anatomy of perspective drawing (Picture Plane, Centre line of vision, Eye Level, Height Line, Vanishing Points, Cone of Vision, Station Point, Horizon line, Ground line etc)
- Types of perspective drawing (one point, two point, three point)
- Introduction to methods of perspective drawing (Direct method , Approximate method, perspective grid)

UNIT-2 TWO POINT PERSPECTIVE VIEW OF BUILDINGS

- Construction of Two point perspective grid.
- Exercise on two point exterior perspectives of simple objects and their combination
- Exercise on Two point Perspective of building Interior by Direct projection Method / Approximate Method.
- Exercise on Two point Perspective of building exterior by direct projection Method / Approximate Method.
- Exercise on Sectional perspective

UNIT-3 ONE POINT INTERIOR PERSPECTIVE

- Construction of One point perspective grid
- Exercise on two point exterior perspectives of simple objects and their combination
- Exercise on One point Interior view of any room *viz* Bed Room, Kitchen, Drawing room etc. by direct projection Method / Approximate Method.

UNIT-4 SCIOGRAPHY

- Principles of Shades and shadows (Techniques of drawing shades and shadows of lines, planes, solids and architectural Building Elements)
- Exercise on Shade and shadow of typical building on Elevation and Site Plan
- Exercise on Shades and Shadows in perspective.

UNIT-5 MEASURED DRAWING

- Introduction to techniques on measurements of buildings, drawing and presentation
- Measured drawing of single storied building(s) :To measure and draw the Ground Floor Plan along with plot boundaries, four side elevations, two sections, block plan, site plan of existing single storied building (maximum of 100.0 sq. m. Plinth area).
- Exercises to include application of shade and shadow in site plan, elevation and exterior perspective.

COs & LOs for Graphics-II

Overall Course Outcome: The students will be able to create drawings in perspectives for exteriors and interior along with shades and shadows. Students also learn to understand and develop measured drawing for a small residential space.

CO1	Students will be able to **construct** the perspective drawings of different types and using different methods.	LO1	**Learn** the principles of perspective drawing
		LO2	**Understand** the types and terminology of perspective drawing
		LO3	**Analyse** the steps for making a one point and two point perspective
		LO4	**Construct** the perspective drawing for simple geometric objects
		LO5	**Exercise** the steps for making perspective drawings for combinations of simple geometric objects
CO2	Students will be able to **construct** two point perspective drawings for simple objects, its combinations, interior and exteriors of simple buildings	LO1	**Study** the construction and development of two point perspective grid
		LO2	**Understand** the steps to develop two point perspectives from various levels, in interior and exterior building views.
		LO3	**Compare** the two methods of perspective drawing : direct method and approximate method
		LO4	**Exercise** the two point perspective of building interior and building exterior
		LO5	**Exercise** the two point perspective in sectional view.
CO3	Students will be able to Construct one point perspective drawings for simple objects, its combinations and various interior spaces	LO1	**Study** the construction and development of one point perspective grid
		LO2	**Understand** the steps to develop one point perspectives in interior spaces
		LO3	**Visualise** the one point perspective drawing of interior spaces at various levels
		LO4	**Exercise** the one point perspective of a kitchen/bathroom interior
		LO5	**Exercise** the one point perspective of a bedroom/ living room interior.
CO4	Students will be able to **develop** shades and shadows in 2D and 3D drawings	LO1	**Learn** the terminologies of sciography and principles of shade and shadow in architectural graphics
		LO2	**Understand** techniques of drawing shades and shadows of simples shapes
		LO3	**Visualise** shade and shadow for various building elements in 2D and 3D
		LO4	**Exercise** shade and shadow for typical building on elevation, and site plan
		LO5	**Exercise** shade and shadow for typical building in perspective drawing
CO5	Students will be able to **create** plans, elevation sections for the same	LO1	**Learn** the significance of measured drawing in architecture
		LO2	**Understand** the measured drawing techniques for plans, elevation, site plan etc
		LO3	**Visualise** and draw the sketch design of measured building
		LO4	**Create** architectural drawings(plan, sections, four elevations, site plan) for the measured ground floor of the given building
		LO5	**Exercise** shade and shadow for the building elevation, site plan, and perspective drawing of the measured building

REFERENCES:

Robert W.Gill, “Perspective From Basic To Creative”, Thames and Hudson, London, 2006

1. Francis D.K Ching, “Architectural Graphics- Fifth Edition”, John Wiley and Sons, New Jersey,2009.
2. John Montague, “Basic perspective Drawing A Visual Approach”, John Wiley and Sons, New Jersey, 2009.
3. Milind Mulick, “Perspective”, Jyotsna prakashan, 2006
4. Ernest Norling, “Perspective Made Easy”, Dover publications, 1999
5. M.G. Shah & C.M. Kale, “Principles of Perspective Drawing”, Asia publishing House, 1965

4. Structure – II (Code – 210214)

Objectives –

The course aims to obtain basic knowledge & overview of structural systems used in buildings, the structural form and the evolution of structural design knowledge, from Gothic cathedrals to long span structural systems, simple structural behavior.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210214**	Structure II	BSAE-4	50	10	20	20	-	-	-	100	3	2	1	-	**3**	PP	Offline***

UNIT-1 OVERVIEW OF VARIOUS TYPES OF STRUCTURAL SYSTEMS IN ARCHITECTURE

Simple RCC frame system used for small span buildings –vaults & domes of various spans – types of trusses & their application for industrial buildings – various configurations in rcc roof slab – RCC folded plate roofing systems – Various types of shell structures – Space frames in steel used for large spans – Tensile structural systems – Suitable examples for all these structural systems.

UNIT-2 BASIC STRUCTURAL CONCEPTS

Various types of loads in buildings – compression and tension in structures – Effect of temperature & settlement on buildings – properties of structural materials such as steel, concrete, RCC, wood, brick & stone – Evolution of the concept of span from architectural history: Temples in Egypt, Greece, South India, Indo- Aryanetc – Vaults & domes in historical buildings: Domes in Pantheon & Hagia Sophia, Vaults during Romanesque, Gothic & Mughal period .

UNIT-3 REINFORCED CEMENT CONCRETE STRUCTURES

Simply spanned RCC slabs & load bearing walls – one way &two way RCC slabs – coffer slab, grid beam slab in RCC – vault, dome, pitched roof, hipped roof in RCC -simple RCC frame structural system up to 5 floors – their application with suitable examples. Concept & various configurations of the folded slab roof – Concept of thin shells – simply curved & doubly curved shells, interpenetrating cylindrical shells, hyperbolic paraboloids, HyPars etc.

UNIT-4 STEEL STRUCTURAL SYSTEMS

Simple steel truss - members in tension & compression – various types of trusses – Warren, Pratt, Fink, Howe, Bowstring, mansard etc – girders & trusses in saw tooth roof configuration, Steel frame domes – Fuller, Geodesic, schwedler dome configurations - Concept of Space frames: various types, single, double & triple layered tubular steel space frames & their use as long span structural system – Concept of tensile roofing system – saddle roof, mast supported, Arch supported, Point supported & their combinations – tensegrity roof structures.

UNIT-5 STRUCTURAL MECHANICS

Composition and Resolution of Forces – concept of stress / strain, young's modulus, typical stress strain curve for ductile & rigid materials, Hooke; law – Theory of Bending Moment & Shear force – their application in buildings for various loads & support conditions (Simply supported, Cantilevered, continuous etc). Simple problems on the above mentioned.

COs & LOs for Structure - II			
Overall Course Outcome: Students will be able to identify various structural systems and will be able to analyze simple structural behaviour using bending moment and shear force diagrams in buildings.			
CO1	Students will able to **understand** the various types of structural systems in architecture	LO1	**Learn** about simple RCC frame systems, trusses, etc.
		LO2	**Understand** use of RCC shell structure, space frames and tensile structure.
CO2	Students will be able to **understand** types of loads in buildings and properties of different materials used in structure.	LO1	**Learn** various types of loads in buildings
		LO2	**Understand** compression and tension in structures and properties of various structural materials.
CO3	Students will able to **examine** different reinforced cement concrete structures .	LO1	**Study** about simply spanned RCC slabs & load bearing walls.
		LO2	**Understand** one way& two-way RCC slabs, coffer slab, grid beam slab in RCC, vault, dome, pitched roof, hipped roof in RCC.
		LO3	**Examine** different RCC slabs used in building.
CO4	Students will be able to **analyze** various steel structural systems.	LO1	**Learn** about a simple steel truss system.
		LO2	**Understand** the concept and use of various types of truss, Steel frame domes and space frames.
		LO3	**Identifying** various steel structural systems.
		LO4	**Analyzing** simple steel truss system, one way& two-way RCC slabs, coffer slab, grid beam slab in RCC, vault, dome, pitched roof, hipped roof in RCC.
CO5	Students will be able to **solve** problems on structural mechanics.	LO1	**Learn** about composition and resolution of forces
		LO2	**Understand** the concept of stress/strain, young's modulus,typical stress strain curve for ductile & rigid materials, Hooke's Law and theory of Bending Moment & Shear force.
		LO3	**Solve** problems on stress/strain, young's modulus, typical stress strain curve for ductile & rigid materials, Hooke law and Bending Moment & Shear force.

REFERENCES:

1. Henry .J.Cowan, Forrest Wilson, *Structural Systems*, Van Nostrand Reinhold Company, New York. 1981
2. Bjorn N Sandekar et al, The structural basics of Architecture – 2nd edition, Routledge, Newyork, 2011.
3. Mario Salvadori, Robert Heller, *Structure in Architecture*, Prentice International Series in Architecture, New Jersey, 15th Printing edition (*1963*)
4. Wayne Place, Architectural structures, John wiley & sons, Canada, 2007.
5. Curt Siegel, Structure and Form in Modern architecture, Reinhold publishing corporation, Newyork,. (1966)
6. Rowland J. Mainstone, Developments in Structural form, Architectural press, Oxford, 1975.1999

5. History of Architecture- II (Code – 210215)

Objectives –

The course aims to obtain knowledge of evolution with regarding to Indian architecture, in India as this is an integrated expression of art, culture, vernacular material and techniques of the place, designs those are rooted in this country and suitable to the lifestyle of its people, varied culture and the resulting architectural productions which are unique in time and place.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210215**	History of Architecture- II	DC- 6	50	10	20	20	-	-	-	100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 EVOLUTION OF HINDU TEMPLE ARCHITECTURE:

Hindu forms of worship – Origin and evolution of temple form (Nagar, Dravida & Vesara) - meaning, symbolism, ritual and social importance of temple, categories of temple, and elements of temple architecture.

UNIT-2 NORTHERN INDIAN TEMPLES:

Early shrines of the Gupta Period. Their salient features. Salient features of Nagara Style Temple Architecture. Examples of Orissa style - Lingaraja temple at Bhubaneswar & Sun temple at Konark - Example of Madhya style – KandariyaMahadev temple at Khajuraho - Example of Gujarat style - Surya Temple at Modhera.- Example of Maru-gurjara style – Ambaji Mata Temple, Udaipur, Example of Jain style temple- Dilwara temple, Mt. Abu. Examples of North & North East (Kashmir, Uttarakhand, etc.)

UNIT-3 DRAVIDIAN STYLE TEMPLES:

Brief history of South India - relation between Bhakti period and temple architecture - Temple Complexes & Towns (Madurai, Srirangam), Dravidian Order (evolution of Dravidian orders under pallavas, cholas and pandyas), Gopurams and Rock cut productions.

Examples: Early shrines of the Chalukyan periods, Tigawa temple - Ladh Khan and Durga temple, Aihole - Papanatha, Virupaksha temples, Pattadakal- Rock cut productions under Pallavas, Shore temple and five rathas at Mahabalipuram,Kailasanatha temple, Ellora. Example of Chola style - Brihadeeswara temple at Tanjore - Example of Pandyan style - Meenakshiamman temple, Hoysala architecture: Belur and Halebid. and Kailasanathar temple at Kanchipuram.

UNIT – 4 INDO - ISLAMIC ARCHITECTURE

Introduction to Islamic culture worldwide, Classification of Islamic architecture in India, Mughal Architecture in India. Religious (Maqbara, Masjid, Idgah, etc.) and Secular typologies (Sarai, Rauza, etc.) of Islamic architecture. Features of an Indian mosque, concept of squinch arches, and its variations. Imperial style. Provincial styles. Characteristics of Mughal architecture, planning, dome construction, materials. Development of the Mughal style under different rulers

Examples under imperial style - Qutub Complex, Qutubminar and Alai Darwaza at Delhi - Tomb of Ghiasuddin Tughlaq, Lodi garden at Delhi. Characteristics of the provincial styles in different regions through examples - Punjab style - Tomb of shah Rukni Alam, Bengal style - Chotasona masjid at Gaur, Gujarat style - Jami masjid at Ahmedabad, Deccan style –Gol gumbaz at Bijapur and Charminar at Hyderabad.

Examples of Mughul architecture under different rulers - Humayun- Humayun's Tomb at Delhi, Akbar- Fatehpur Sikhri. Shahjahan - The Taj Mahal, Agra - Red Fort at Delhi, etc.

UNIT – 5 FORTIFICATIONS AND PALATIAL ARCHITECTURE

Introduction to Fortifications, forts, Palaces across the country.

Examples of Forts – Salient features of forts like Gwalior Fort, Daulatabad Fort, Golconda Fort, etc.

Examples of palaces – Salient features of palaces like Mysore Palace, Padmanabha Palace, Umaid Bhawan, etc.

COs & LOs for HOA – II

Overall Course Outcome: Students will be able to **develop** an appreciation of varied cultures and the resulting architectural productions that are unique in time and place & suitable to the lifestyle of its people.

CO1	Students will be able to **apply** various temple architectural forms and architectural expressions in their own design.	LO1	**Learn** basic concepts of temple architecture of India.
		LO2	**Understand** diverse artistic and architectural expressions in Indian Temple Architecture and origin and evolution of it.
		LO3	**Illustrate** visual and verbal vocabularies of various categories of temple architecture of ancient India.
		LO4	**Analyze** temple architectural forms and space and its importance in Indian culture
		LO5	**Reproduce** with the help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of temple architecture of India.
CO2	Students will be able to **apply** the North Indian temple Architecture style and elements in their own design.	LO1	**Learn** basic concepts of North Indian temple architecture.
		LO2	**Understand** diverse artistic and architectural expressions in North Indian temple architecture through examples.
		LO3	**Illustrate** specific visual and verbal vocabularies of North Indian temple architecture.
		LO4	**Analyze** North Indian temple architectural forms and space and its meaning, symbolism, rituals & social importance in Indian culture.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of North Indian temple architecture.
CO3	Students will be able to **apply** the South Indian temple Architecture style and elements in their own design.	LO1	**Learn** basic concepts of South Indian temple architecture.
		LO2	**Understand** diverse artistic and architectural expressions in South Indian temple architecture through examples.
		LO3	**Illustrate** specific visual and verbal vocabularies of South Indian temple architecture.
		LO4	**Analyze** South Indian temple architectural forms and space and its meaning, symbolism, rituals & social importance in Indian culture.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of South Indian temple architecture.
CO4	Students will be able to **apply** elements and concepts of Islamic in their own design.	LO1	**Remember** basic concepts and division in Islamic culture & architecture
		LO2	**Identify** diverse artistic and architectural forms in religious spaces, Gateways, Minarets, Palaces, Tombs, etc.
		LO3	**Illustrate** visual and verbal vocabularies of each of religious spaces, Gateways, Minarets, Palaces, Tombs, etc. in Islamic Architecture.
		LO4	**Analyse** architectural forms and space with reference to various examples of buildings in Islamic Architecture.
		LO5	**Replicate** with help of sketches, visuals (softwares) and 3D (models) of various architectural forms and styles of Islamic Architecture.
CO5	Students will be able to **apply** elements of forts and palaces in their own design.	LO1	**Understand** the various typologies of forts and palaces in India
		LO2	**Identify** prominent architectural characters of forts & palaces in India.
		LO3	**Illustrate** visual and verbal vocabularies of forts & palaces in India.
		LO4	**Analyse** architectural forms and space with reference to forts & palaces in India.
		LO5	**Replicate** with help of sketches, visuals (softwares) and 3D (models) of various architectural forms and styles of forts & palaces in India.

REFERENCES:

1. Percy Brown, Indian Architecture (Islamic Period) - Taraporevala and Sons, Bombay, 1983 revised edition 1995
2. Satish Grover, The Architecture of India (Buddhist and Hindu period), Vikas Publishing House, New Delhi, 1981
3. Satish Grover, The Architecture of India (Islamic)Vikas Publishing House Pvt. Ltd., New Delhi, 1981. revised edition 2009
4. Christopher Tadgell, The History of Architecture in India, Longman Group, U.K. Ltd., London, 1990
5. A.Volwahsen, Living Architecture - India (Buddhist and Hindu), Oxford and IBM, London, 1969.
6. George Mitchell, Monuments of India, Vol I, Buddhist, Jain, Hindu; Penguin books, 1990
7. Gateway to Indian Architecture, Guruswamy Vaidyanathan, Edifice Publication, 2003
8. Architecture of the Islamic World - George Michell - (its history and social meaning), Thames and Hudson, London, 1978.

6. Theory of Design (Code – 210216)

Objectives –

The course aims to obtain the theoretical aspects of design and understand how it could be manifested in architectural design, the ideologies from works of architects and planners, the design communication skills to enable to put forth the design ideas in graphics and literature.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	**210216**	Theory of Design	DC- 7	50	10	20	20	-	-	-	100	2	2	-	-	**2**	pp	Blended* (2/1)

UNIT-1 PRIMARY ELEMENTS IN ARCHITECTURE

Geometry in Architecture - points, lines and shapes. Linear elements, planar elements and volumetric elements. Patterns in nature and building design. Order to chaos. Regularity and irregularity.

UNIT-2 FORM AND SPACE

Elements of spatial definition – form defining space - elevated base plane, depressed base plane-vertical and horizontal elements defining space -depth and density of space - spatial juxtaposition and interpenetration – spatial characteristics of elementary shapes - qualities of architectural space - degree of enclosure. Analysis of works of famous architects in India & abroad.

UNIT-3 ORDERING PRINCIPLES AND MEANING IN ARCHITECTURE

Ordering Principles-Axis -Symmetry -Hierarchy - Datum -Rhythm -Repetition -Transformation - Measure and balance – spaces on human scale - proportion -- Golden Section, Le modular, Fibonacci series – Renaissance Theories - anthromorphism and architecture - Figure and ground, positive and negative spaces.

UNIT-4 CONCEPTS IN ARCHITECTURAL DESIGN

Concept – types- Ideas and Intent in design - Intuitive, contextual, Iconic, Experiential, Symbolic, Modular. Ideologies and philosophies of architects'. Case Studies. Importance of graphics in architectural design. Study of site plans, city plans, conceptual drawings. Interpretation of architects' conceptual sketches and the respective buildings. Vernacular Architecture. Western & Indian Philosopher.

UNIT-5 RESPONSIVE AND RESPONSIBLE ARCHITECTURE

Phenomena of perception – looking, listening, feeling and moving through architecture –light and shade – Architecture as Making Frames -, Environmental-Energy based.

COs & LOs for Theory of Design			
Overall Course Outcome: Students will be able to **develop** an appreciation of design principles and elements and the resulting theories in architectural fields that are unique in time and place.			
CO1	Student will be able to **Understand** basic fundamental of design in natural and manmade environment	LO1	**Relate** various elements , spaces and design principles
		LO2	**Categorize** essential theoretical aspects in architectural studies
		LO3	**Distinguish** between regularity and irregularity
		LO4	**Experiment** patterns in design inspired from nature
CO2	Students will be able to **Discuss** best examples of built forms and situate them in the theoretical framework.	LO1	**Define** spatial elements of design to achieve good designs
		LO2	**Learn** spatial characteristics of shapes. spaces
		LO3	**Analyze** works of famous national and international architects
CO3	Student will be able to **Understand** the significance of aesthetics, history in architectural design.	LO1	**Memorize** aesthetic principles of design
		LO2	**Journal** about historical design concepts and theories
		LO3	**Link** human scale and proportion within the space
CO4	Students will be able to **develop** architectural thinking through past and present work to link design & theory.	LO1	**Relate** theories and ideologies of different architects in comparative mode
		LO2	**Analyze**Ideas from abstract thinking and implement them
		LO3	**Judge** Different types of architectural plans and drawings
		LO4	**Interpret** thoughts of architects through their sketches
CO5	Students will be able to **Prioritize** social responsibility for perfecting designs that improve the functions.	LO1	**Relate** human senses with architecture
		LO2	**Experiment** light and shadows in building form and design
		LO3	**Adapt** sustainable goals for designs
		LO4	**Focus** on ecological and humanitarian issues

REFERENCES:

1. Francis D.K.Ching, Architecture-Form, Space and Order, Van Nostrand Reinhold Company, New York, 2007.
2. Simon Unwin, Analysing Architecture, Rouledge, London, 2003.
3. V.S.Pramar, Design Fundamentals in Architecture, Somaiya Publications Private Ltd., New Delhi, 1973.
4. Peter von Meiss -Elements of architecture - from form to place, Spon Press 1992.
5. Steen Eiler Rasmussen - Experiencing architecture, MIT Press, 1964.

7. Workshop – II (Code – 210217)

Objectives –

The course aims to obtain the ability to appreciate the three dimensional implications of design and to introduce the students to the techniques of model making, basics of rendering, presentation skills &model making with various materials.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	**210217**	Workshop – II	SEC- 3	-	-	-	-	20	20	10	50	4	-	-	4	**2**	-	Offline**

UNIT-1 MODEL MAKING

Use of clay, Plaster of Paris, metal scrap, metal sheets, jute fibre etc. for study of forms through models. Making models of the various structural systems used in buildings like Space frames – using Match sticks, wires. Different forms of shell roofs using POP, Clay, Tensile structures using fabric, Origami Structures. Graphic's Models.

Exercise: Models of famous buildings out of above materials and techniques.

UNIT-2 MODEL MAKING WITH CNC

Use of a CNC machine in cutting boards. Different types of boards that are used. Working of CNC machine.

Exercise: Model Construction using CNC machine.

UNIT-3 INTRODUCTION TO ARCHITECTURAL MODEL MAKING AND BLOCK MODELLING

Introduction to concepts of model making and various materials used for model making Preparation of base for models using wood or boards. Introduction to block models of buildings (or 3D Compositions) involving the usage of various materials like Mount Boards, Clay etc. and the machines for cutting.

UNIT-4 DETAILED MODELLING

Making a detailed model which includes the representation of various building elements like Walls, Columns, Steps, Windows/glazing, Sunshades, using materials like Mount board, Snow-white board, and acrylic sheets. Representing various surface finishes like brick/stone representation, stucco finish etc. Various site elements– Contour representation, Roads/Pavements, Trees/Shrubs, Lawn, Water bodies, Street furniture, Fencing etc.

UNIT-5 PHOTOGRAPHY

Introduction to photography, use of camera, techniques in architectural photography.

COs & LOs for Workshop I			
Overall Course Outcome: Students will be able to develop, draw simple and complex models in various materials using different techniques.			
CO1	Students will be able to **create** a replica model.	LO1	**Learn** various materials used in model making.
		LO2	**Understand** the fundamentals structures and stabilization of structures.
		LO4	**Replicate** a Model of a building using the materials and techniques learned.
CO2	Students will be able to**Construct** models using a CNC machine.	LO1	**Learn** the mechanics of CNC machines.
		LO2	**Understand** different materials and their appropriate use in CNC machines.
		LO3	**Construct** a model using a CNC machine.
CO3	Students will be able to **build** architectural blocks and building models.	LO1	**Learn** various types of architectural models and materials that can be used.
		LO2	**Build** an architectural model of a small-scale building.
CO4	Students will be able to **construct** detailed models.	LO1	**Learn** the details of various architectural elements.
		LO2	**Understand** the construction details of various architectural elements.
		LO3	**Weld** a model or an abstract using the different processes and equipment.
CO5	Students will be able to **click** professional architectural photographs	LO1	**Learn** about various photography skills and cameras.
		LO2	**Understand** use of cameras
		LO3	**Identify** techniques in architectural photography.
		LO4	**Exercise** the techniques learned in clicking architectural photographs.

REFERENCES:

1. BENN, the book of the house ,Errnest Benn limited London
2. Jannsen, Constructional Drawings & Architectural models, Kari Kramer Verlag Stuttgart, 1973.

SECOND YEAR THIRD SEMESTER

1. Architectural Design – III (Code – 210311)

Objectives –

The course aims to obtain knowledge of Architecture as responding to site conditions, the designing process, spaces and relationship of architecture with personal traits, information and choices such as occupation, life style, religion etc.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210311**	Architectural Design – III	DC- 8	100	20	20	20	50	30	10	250	6	2	2	2*(1.5)	**7**	AO	Offline**

PROJECT 1(Prototype): TOWNHOUSE / VILLA

Study of contemporary practices & design for townhouses and villas in urban areas, to sensitize the students towards life style, individual preferences, space – activity relationship and exploration of how material, color, texture and light affect the quality of spaces is the main focus. It is also intended as an exercise in massing & configuration of façade elements such as the balancing of solids & voids, adoption of a system of proportioning and elements of contemporary detailing. This design exercise will also attempt to involve the student in the built form / open space relationship & explore the connectivity between indoor & outdoor spaces.

PROJECT 2(Prototype): NURSERY / PRIMARY / SECONDARY SCHOOL

Case studies on contemporary trends in school design to know how various architects have responded to the design program, site conditions, student age group etc. The project aims to enlighten the student on how the school design responds to various education philosophy and grooming methods. The analysis of important functional aspects such as space adequacy, circulation in the built form and play areas, locating the various spaces according to functional adjacency and careful design of toilet areas is intended. The objective is to also optimize the variables of the physical environment such as thermal comfort, daylighting and noise control in design.

PROJECT 3 & 4(Prototype): Time bound Problems of 6 hours to 48 hours.

COs & LOs for Architectural Design – III

Overall Course Outcome: The course aims to obtain knowledge of Architecture as responding to site conditions, the designing process, spaces and relationship of architecture with personal traits, information and choices such as occupation, life style, religion etc.

CO1	Students will be able to **design** townhouses and villas	LO1	**Identify** spaces responding to site condition and personal issues such as occupation, lifestyle, religion etc.
		LO2	**Map** gathered information of visited physical setting
		LO3	**Explore** the integration of indoor and outdoor areas.
		LO4	**Produce** sketches, models and photographs for analysis and design.
		LO5	**Analyze** the materials, construction techniques and structural systems used in the elements of built forms.
CO2	Students will be able to **design** buildings related to education philosophy.	LO1	**Develop** sensitivity towards existing habitat spaces with its building elements
		LO2	**Analyze** how school designs respond to various education philosophy and grooming methods with help of case studies.
		LO3	**Explore** the integration of classroom spaces with outdoor play areas in school buildings.
		LO4	**Produce** sketches, models and photographs for analysis and design.
		LO5	**Design** school buildings that respond to a particular educational philosophy.
CO3/CO4	Students will be able to maximize the potential of their designing skills within the period.	LO1	**Understand** the application of the architectural design process for medium scale projects of human habitat
		LO2	**Transform** the human behavioural needs into architectural program requirements
		LO3	**Analyze** the information on context and the human-space relationship
		LO4	**Compose** the architectural spaces in a design project in a given period.
		LO5	**Communicate** architectural drawings with the help of various mediums in given period.

REFERENCES:

1. Time saver standards for building types, De Chiara and Callender, Mc Grawhill company.
2. Neufert Architect's data, Bousmaha Baiche& Nicholas Walliman, Blackwell science ltd.

Note: minimum four design problems shall be introduced in the semester out of which, one major problem, one small problem and two shall be time bound problems**.**

Note: One design problem shall be given in the End Semester Examination. 6X2 hours examination.

2. Building Construction – II (Code - 210312)

Objectives –

The course aims to obtain knowledge about doors, windows, different types of materials and their use in construction, the different waterproofing, damp proofing materials & technology available & their application, the vertical transportation designing & detailing.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210312**	Building Construction -II	BSAE-	50	10	20	20	20	20	10	150	5	2	1	2*(1.5)	**6**	PP	Blended** (3/3)

UNIT-1 BUILDING MATERIALS

Ferrous and Non-Ferrous metals & Plastics

• Properties and uses: Aluminum, zinc, lead, copper.

• Properties and Architectural uses of plastics: Thermoplastics, thermosetting plastics and, Structural plastics – Reinforced plastics and Decorative laminates-plastic coatings, Adhesives, and sealants – Modifiers and Plasticizers – Fabrications of plastics.

• Primary plastic building products for walls, roof, and partitions.

UNIT- 2 DETAILS OF DOORS, WINDOWS & VENTILATORS

• Timber Doors and its Joints: Single, double-leaf, ledged braced & battened door, framed ledged braced battened door, Paneled door, flush door, and Composite door.

• Timbers Windows & ventilators: Casement(side hug & top hug), Sliding pivoted (horizontal and vertical) folding and bay windows, fixed light of different sizes and shapes.

• Combined doors and windows and ventilators.

UNIT-3 STAIRCASES AND LIFT

• Staircases: Types according to profile–straight flight, dog legged, quarter-turn half-turn, bifurcated, spiral & Helical.

• Lift: Vertical transportation. Types and details.

UNIT-4 DAMP PROOFING AND WATERPROOFING

• Damp proofing: Hot applied and cold-applied–Emulsified asphalt, Bentonite clay. Butyl rubber, silicones, Vinyl's, Epoxy resins and metallic waterproofing materials, their properties, and uses. Waterproofing: waterproofing membranes such as rag, asbestos, glass felt, plastic and synthetic rubber vinyl, butyl rubber, neoprene, polyvinyl chloride – prefabricated membranes sheet lead, asphalt their properties and uses.

• Application: Application of the above in the basement floor, swimming pool, and terraces.

UNIT-5 CLADDING SYSTEMS & FINISHES

• Types of Cladding systems – Stone, timber, weatherboard, Fiber cement, Brick, Vinyl, Metal (aluminum composite panels (ACP), Precast concrete cladding panel, Curtain wall, Rain screen wall system. Exterior insulation & Finishes.

COs & LOs for Building construction-II

Overall Course Outcome: Students will be able to **understand** the knowledge about doors, windows, different types of materials and their use in construction, the different waterproofing, damp proofing materials & technology available & their application, the vertical transportation designing & detailing.

CO1	Students will be able to **understand** the role of metal in structure technology .	LO1	**Remember** basic concepts metal, and its uses.
		LO2	**Learn** the properties of different metals.
		LO3	**Understand** its uses in the architecture industry.

		LO4	**Analyze** the types of Reinforced plastics and Decorative laminates-plastic coatings, Adhesives, and its uses.
		LO5	**Evaluating** its role for rooms, windows, roof lights, domes, gutters, and handrails..
CO2	Students will be able to **demonstrate** their understanding through application in design and detailing of doors, windows & ventilators.	LO1	**Remember** basic concepts regarding detailing of doors, windows & ventilators.
		LO2	**Learn** its types according to uses.
		LO3	**Understand** the detailing of doors, windows & ventilators.
		LO4	**Analyze** the various types of doors, windows & ventilators, their extensive uses in building construction.
		LO5	**Draw** all the elements of doors, windows & ventilators.
CO3	Students will be able to **demonstrate** their understanding through application in design and detailing of staircase & lifts.	LO1	**Remember** basic concepts regarding detailing of R.C.C staircases and masonry.
		LO2	**Learn** its types according to profile.
		LO3	**Understand** the detailing of staircases and Lift.
		LO4	**Analyze** the various types of staircases and masonry, their extensive uses in Building construction.
		LO5	**Draw** all the elements of staircases and lifts.
CO4	Students will be able to **analyze** damp proofing and waterproofing in the building with its application.	LO1	**Learn** basic concepts about damp roofing & waterproofing.
		LO2	**Understand** its various types of damp roofing.
		LO3	**Apply** it on a given live project.
		LO4	**Analyze** the market survey of different types of damp roofing & waterproofing material available in the market.
		LO5	**Evaluating** through case studies and drawings of selected building types.
CO5	Students will be able to **analyze different** cladding systems and finishes for the building.	LO1	**Learn** basic types of cladding material.
		LO2	**Understand** its uses on a project.
		LO3	**Apply** it on a given live project.
		LO4	**Analyze** the market survey of different types of cladding material available in the market.
		LO5	**Evaluating** through case studies and drawings of selected building types.

REFERENCES:

1 . W.B. Mckay – Building construction Vol. 1 (5th edition), Vol. 2 (4th edition) and Vol. 3 (5th edition)

2. R.Chudley & R.Greeno – Building Construction Handbook, ninth edition
3. S.C. Rangwala – Engineering materials (Fortieth edition) – Charotar Publishing pvt.ltd
4. P.C Varghese, "Building Materials", Prentice Hall of India Pvt. Ltd., New Delhi, 2005
5. Use of Bamboo and Reeds in building Construction – UNO Publications

Note: Total five questions shall be asked. Each question will consist of two parts, one of which will be of 7 marks (which shall be compulsory) and another with 3 marks(which shall be optional).

3. Graphics –III (Code – 210313)

Objectives –

The course aims to obtain knowledge of various softwares used for drafting, 3D model making, rendering and presentation, such as AutoCAD, Revit, 3Ds MAX, Photoshop, CorelDraw, etc. according to the availability of experts.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210313**	Graphics -III	PAEC-1	-	-	-	-	20	20	10	50	6	-	-	6	**3**	SO	Offline**

UNIT-1 COMPUTER AS A DRAFTING TOOL

- Productivity tools in CAD, organization of layers for working drawings, use of blocks and symbols hatch patterns.
- Dimensioning systems extracting of areas from drawings, concept of paper space plotting the drawings

UNIT-2 COMPUTER AS A DESIGN TOOL

- Repetition of forms mirroring, coping and array, etc. calculation of areas, volumes.
- Creating and using templates, blocks, and symbols and using them in architectural drawings. - Managements of large drawing files.
- Working in a network environment-Security systems-converting drawing files into Internet compatible files.

UNIT-3 MEASUREMENT DRAWING WITH THE HELP OF CAD

- Exercise will be a group activity; to measure and draw the floor plan along with the plot boundaries, four side elevations, four sections and block plan, site plan of a large building or a settlement with the help of CAD.
- In addition to this drawing shall be prepared based on examples of buildings by giving a sketch design. Drawings shall be detailed enough to explain the complete design.

UNIT-4 VISUAL COMMUNICATION

- Photoshop: Creating and saving images, basic image editing, Photoshop toolbox and tools, using layers, special effects.
- 3-D Max/Sketchup: Creating simple models of buildings, basic editing, tools, effects, etc.

UNIT-5 INTRODUCTION TO RHINO

- Rhino: Creating and saving images, basic 3D development & parametric development.

COs & LOs for Graphics III			
Overall Course Outcome: Students will be able to draft plans, elevations, sections, views and other details and render them to make them look professional.			
CO1	Students will be able to **apply basic** commands in AutoCAD to draw objects.	LO1	**Learn** about computer-aided drawing.
		LO2	**Understand** the objects, blocks, symbols, hatch patterns in AutoCAD.
		LO3	**Apply** various tools in AutoCAD with reference to drawings.
		LO4	**Draw** objects using basic dimensioning, patterns, plotting, etc.
CO2	Students will be able to **draw** complex objects using complex commands in AutoCAD.	LO1	**Learn** various further complex commands in AutoCAD to design.
		LO2	**Understand** management of files, working in a network environment, etc.
		LO3	**Design & Draw** complex objects using commands learned.
CO3	Students will be able to **draw** measured drawings.	LO1	**Learn** the concept of measured drawing and details to be considered while doing measured drawing.
		LO2	**Understand** how AutoCAD can be used to measure drawings.
		LO3	**Apply** various commands of AutoCAD in measured drawings.
		LO4	**Draw** measured drawing of a building includes plans, elevations, sections etc.
CO4	Students will be able to use Photoshop to **illustrate** building plans, elevations, etc. professionally.	LO1	**Learn** various tools in Photoshop & 3D software.
		LO2	**Understand** use of commands in Photoshop & 3D software.
		LO3	**Apply** various commands to draw in Photoshop & 3D software.
		LO4	**Draw** components, complex composition, rendering of Plans, elevations, sections in Photoshop & 3D software.

Note: Exercises of measurement drawings may be clubbed with study tours.

REFERENCES:

1. User manual & tutorials of Google Sketch Up software.
2. Auto CAD reference manual – Autodesk UNC, 1998
3. Auto CAD architectural user's guide – Autodesk Inc. 1998
4. Sham Tickoo, Advanced Technique in AutoCAD Re.14 – 1977 6. Sham Tickoo, Understanding AutoCAD – 14 (windows) – 1977
5. Photoshop CS Bible – Deke McClelland.
6. Adobe Photoshop 7.0 classroom in a book – Adobe creative team.

4. Surveying and Leveling (Code – 210314)

Objectives –

The course aims to obtain knowledge of the basic process of land surveying and fundamentals of various types of surveys adopted in architecture and civil, use various surveying methods in practice, field survey and to prepare a layout for understanding.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210314**	Surveying & Leveling	BSAE-	50	10	20	20	-	-		100	3	1	2	-	**3**	PP	Blended*** (2/1)

UNIT-1 SURVEYING

Aspects of surveying for the Architect. Surveying instruments classification by function. Useful data and formulae.

UNIT-2 SCALES

Scales-Plain scale, diagonal scale, comparative scale, shrunk scale, vernier scale.

UNIT-3 ACCURACY TEST AND INSTRUMENTS

Study, test, degree of accuracy, use and care of surveying instruments and accessories.

UNIT-4 SURVEY TECHNIQUES

Site survey techniques: Chain surveying, compass surveying, plain table, and theodolite.

UNIT-5 LEVELING AND CONTOURING

Basics of Leveling and contouring. Processes to level a highly undulated sites and contour a plain site.

Note: Class work and field work of the above subject should be oriented towards the layout of buildings. Students should also be taken to site visits for explaining the practical aspects of surveying.

COs & LOs for Surveying and Levelling			
Overall Course Outcome: Students will be able to identify different survey techniques and will be able to use instruments used in survey to develop the layout of the building.			
CO1	Students will be able to understand and apply surveying instruments and useful formulas used in surveying.	LO1	**Learn** various aspects of surveying for the Architect.
		LO2	**Understand s**urveying instruments, useful data and formulae.
		LO3	**Apply** useful data and formula.
CO2	Students will be able to **construct** various scales used in surveying.	LO1	**Study** various scales used in surveying.
		LO2	**Understand** use of different scale**s.**
		LO3	**Construct** various scales based on requirement.
CO3	Students will be able to **apply** surveying instruments for surveys.	LO1	**Study** use of surveying instruments and accessories.
		LO2	**Understand the degree** of accuracy of the surveying instrument.
		LO3	**Apply** surveying instruments and accessories used in different surveys.
CO4	Students will be able to **apply** site survey techniques and will learn how to make layout of buildings.	LO1	**Learn** different site survey techniques.
		LO2	**Understand** chain surveying, compass surveying, plain table, and theodolite.
		LO3	**Apply** different types of surveying for site surveys.
CO5	Students will be able to **apply** levelling and contouring on site surveys.	LO1	**Learn** about Levelling.
		LO2	**Understand** contouring.
		LO3	**Develop** Levelling and contouring on site survey.

REFERENCE BOOKS:

1. T. P. KANETKAR & S.V. KULKARNI, “Surveying & Leveling”, Pune VidyarthiGriha Pub.
2. DR. B.C. PUNAMIA, “Surveying Vol.1”, Laxmi Pub.
3. SHAHANE AND IYENGAR, “A Text book of Surveying & Leveling”, Engineering Book Co.
4. BERNARD H. KNIGHT, “Surveying and leveling for students”.

5. History of Architecture-III (Code – 210315)

Objectives –

The course aims to obtain knowledge about the development of architecture in the ancient Europe and the culture and context which produced it such as climate, religion, social practices & the politics, the evolution of architectural form & space with reference to Technology, Style and Character using sketches as the principal method of learning - about the prehistoric world, Ancient Egypt, West Asia, Greece ,Rome, Medieval times and Renaissance period.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210315**	History of Architecture-III	DC- 9	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 GREEK ARCHITECTURE

Evolution of City states in Greece, the Hellenic & Hellenistic art & architecture, Evolution of the classical orders & the features of the Greek temple, the building of the Acropolis with one outstanding example of Doric (Parthenon), Ionic (Erechtheon) & Corinthian. Public architecture: Theatre of Epidaurus and Agora, Optical illusions in Greek architecture.

UNIT-2 ROMAN ARCHITECTURE

Formation of Roman republic & Empire & influence of geology, culture & lifestyle. Roman architectural character using concrete, marble, travertine etc & masonry types used for walls. Tuscan & Composite orders, Roman forums and basilicas – methods of Vault & Dome construction with examples of Pantheon, Thermae of Caracalla, Colosseum, & Basilica of Constantine.

UNIT-3 EARLY CHRISTIAN & BYZANTINE ARCHITECTURE

Spread of Christianity, the evolution of early Christian Church form from the Roman basilica (St. Clemente), Centralized plan concept (St. San Vitale, Ravenna). The creation of eastern & western Roman Empire, the development of domes & pendentive, Byzantine architectural character with study of St. Sophia (Hagia Sophia) at Istanbul.

UNIT-4 ROMANESQUE & GOTHIC ARCHITECTURE

Romanesque period: Monastic orders & development of Craft and merchant guilds, Influences & architectural character of Romanesque churches in Italy (Pisa complex), France (Abbey Aux Hommes) and England (Tower of London) - Development of vaulting. Development of Gothic architecture in France, evolution of Gothic Cathedral & structural system using vaulting & flying buttress, the example of Notre dame cathedral at Paris.

UNIT-5 RENAISSANCE ARCHITECTURE IN EUROPE

Idea of rebirth and revival of classical architecture & the development of art & science. Italian renaissance character. Early renaissance & urban renaissance style and High renaissance period. Works of various artists and architects during the period (Andrea Palladio, Sir Christopher Wren, Michelangelo, Leonardo

COs & LOs for HOA – III			
Overall Course Outcome: Students will be able to **develop** an appreciation of various architectural movements and its chronology across the globe and the resulting architectural productions that are unique in time and place.			
CO1	Students will be able to **apply** Greek architectural expressions in their own design.	LO1	**Learn the evolution** of Greek Dynasties & cities.
		LO2	**Understand** diverse artistic and architectural expressions in various periods of Greek Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Greek Architecture.
		LO4	**Analyze** Greek architectural forms and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Greek Architecture.
CO2	Students will be able to **apply** elements of Roman architecture in their own design.	LO1	**Learn the evolution** of Roman Empire, its cities and Architecture.
		LO2	**Understand** diverse artistic and architectural character in various parts of Roman Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Roman Architecture.
		LO4	**Analyze** Roman architectural forms and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Roman Architecture.
CO3	Students will be able to **apply** elements of Egyptian architecture in their own design.	LO1	**Learn** evolution of both Early Christian & Byzantine Architecture.
		LO2	**Understand** diverse artistic and architectural expressions in various periods of Early Christian & Byzantine Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Early Christian & Byzantine Architecture.
		LO4	**Analyze** Early Christian & Byzantine architectural forms and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Early Christian & Byzantine Architecture.
CO4	Students will be able to **apply** elements and concepts of West Asiatic Architecture in their own design.	LO1	**Learn** evolution of both Romanesque & Gothic Architecture.
		LO2	**Understand** diverse artistic and architectural expressions in various periods of Romanesque & Gothic Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Romanesque & Gothic Architecture.
		LO4	**Analyze** Romanesque & Gothic architectural forms and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Romanesque & Gothic Architecture.
CO5	Students will be able to **apply** elements of South East & East Asian architecture in their own design.	LO1	**Learn the evolution** of the Renaissance Architectural Movement.
		LO2	**Understand** diverse artistic and architectural expressions in various periods of Renaissance Architectural Movement.
		LO3	**Illustrate** visual and verbal vocabularies of Renaissance Architectural Movement.
		LO4	**Analyze** Renaissance Architectural Movement, its form and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Renaissance Architectural Movement.

REFERENCES:

1. Sir Banister Fletcher, A History of Architecture, CBS Publications (Indian Edition), 1999.
2. Spiro Kostof – A History of Architecture – Setting and Rituals, Oxford University Press, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994.
4. Pier Luigi Nervi, General Editor – History of World Architecture – Series, Harry N. Abrams, Inc.Pub., New York, 1972.
5. S. Lloyd and H.W. Muller, History of World Architecture – Series, Faber and Faber Ltd., London, 1986.
6. Gosta, E. Samdstrp, Man the Builder, Mc. Graw Hill Book Company, New York, 1970.
7. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962.
8. Vincent Scully: Architecture; Architecture – The Natural and the Man Made : Harper Collins Pub: 1991

6. Structures-III (Code – 210316)

Objectives –

The course aims to obtain understanding of the basic principles of limit state design in reinforced concrete structural systems and the interpretation of detail structural drawings for the purpose of construction, the structural behavior of RCC buildings from an architect's perspective and hence does not delve into the process of detailed structural analysis design which is the forte of the structural engineer.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	**210316**	Structure-III	BSAE- 7	50	10	20	20	-	-		100	3	2	1	-	**3**	pp	Offline***

UNIT- 1 FOUNDATIONS IN BUILDINGS

Soil load bearing capacity – concept of RCC spread footing - Types of R.C.C. foundation – Individual, Combined, Strip footings – Raft foundation (Theory only) – Eccentric footings with projection on one side only- the situations in which the various footings are used – friction pile foundation used in clayey soil (section & understanding of the principle)- pile foundation used in sandy soil & the pile foundation used in multi-storied buildings (section & principle only).Interpretation of typical structural details in foundation drawings .Site visits necessary for understanding the above.

UNIT – 2 ROOF SLABS & STAIRCASE

Exposure to the basic design concepts of Limit state method of design – recommendations in the code book - Classification of slabs – Estimation of loads – Design of one way, two way, circular and continuous slabs using SP – 16(Theory only). Interpretation of reinforcement details in a typical structural drawing for one way, two way slab & continuous slab. Understanding the reinforcement details for a RCC waist slab in dog legged staircase and for a folded slab staircase using typical structural drawings.

UNIT-3 BEAMS & LINTELS

Exposure to the basic design concepts - Estimation of loads on beams – Transfer of load from slab to beam – Understanding the design of simply supported beams, cantilevered & continuous beams using code coefficients & detailing using SP-16 for the design (Theory only). Steel detailing of beams for earthquake proofing (section only) – the function of plinth beam belt & continuous lintel belt –ring beam for RCC dome roof, typical reinforcement detail for waffle (coffer) slab (section only).Site visits to understand typical details in RCC slabs & beams.

UNIT - 4 COLUMNS

Understanding the estimation of loads on columns – Load transfer from slab and beam to columns. Structural behavior of Long and short columns –Distinction between rectangular and circular columns – Difference between columns subjected to uniaxial and those subjected to bi-axial bending. Knowledge about the design of columns using column interaction diagrams (Theory only) – Use of SP-16 for reinforcement detailing. Interpretation of typical structural drawing for columns & footings.

UNIT- 5 FLAT SLABS

Understanding the situations in which flat slabs are used - advantages of flat slab construction. Components of flat slab – Configuration of columns – Design of flat slab by direct design method as per BIS codes (Theory only). Site visit to understand flat slab construction.

COs & LOs for Structure - IV

Overall Course Outcome: Students will be able to design and interpret the structural systems for all reinforced concrete structures using the limit state design method for structural analysis.

CO1	To interpret the structural design process and analyse design of RCC foundations for the purpose construction	LO1	**Learn** the principles of structural design process for RCC foundations
		LO2	**Classify** the types of foundations, soil capacity and loads in design of foundations
		LO3	**Outline** the features of IS code provisions regarding limit state method for designing RCC foundations
		LO4	**Interpret** the typical structural details in foundation design
		LO5	**Asses** the working of structural details through site visit
CO2	To analyse the structural design details and reinforcement of RCC slabs and staircase for the purpose of construction	LO1	**Learn** the principles of structural design method for Slabs and staircase
		LO2	**Identify** the types of RCC slabs and RCC staircases and their design considerations
		LO3	**Outline** the features of IS code provisions regarding limit state method for designing slabs and staircases foundations
		LO4	**Interpret** the typical structural and reinforcement details in slab (one way, two way, continuous) /staircase design , (waist slab, folded slab etc)
		LO5	**Asses** the working of reinforcement details through site visit
CO3	To interpret the load calculation for structural design of beams and lintel in RCC structure and analyse their structural design details for the purpose of construction	LO1	**Learn** the principles of structural design method for Beams and lintel
		LO2	**Outline** the features of IS code provisions regarding limit state method for designing beams and lintel in RCC structures
		LO3	**Evaluate** the load considerations for design of beams and lintel in RCC structures
		LO4	**Interpret** the typical structural details for beams in special conditions such as earthquake resistant buildings, plinth beam, ring beam, coffer slab etc
		LO5	**Asses** the working of structural details through site visit
CO4	To interpret the structural design of columns in RCC structure and the design details using column interaction diagram	LO1	**Learn** the principles of structural design method for column in RCC structure
		LO2	**Outline** the features of IS code provisions regarding limit state method for designing columns in RCC structures
		LO3	**Evaluate** the load considerations, transfer of load and their structural behaviour for design of columns in RCC structure
		LO4	**Interpret** the typical structural details for column and the difference between various columns using column interaction diagram
		LO5	**Asses** the working of structural details through site visit
CO5	To interpret the design of flat slab and their structural details	LO1	**Learn** the principles of structural design method for Flat slab
		LO2	**Outline** the features of IS code provisions regarding limit state method for designing beams and lintel in RCC structures
		LO3	**Evaluate** the need of flat slab in structures and their component and design consideration
		LO4	**Interpret** the typical structural details for flat slab
		LO5	**Asses** the working of structural details through site visit

REFERENCES:

1. Victor E. Sauoma, Structural Engineering- analysis & design, University of Colorado,2011.
2. Simha .N.C and Roy .S.K, Fundamentals of Reinforced Concrete, S. Chand& Co. Ltd, Delhi,2001

7. Summer Internship Project –I (Institute Level Evaluation) (Code – 210319)

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	**210319**	ummer Internship roject –I	SEC- 4	-	-	-	-	50	-		50	2	-	-	2	**1**	SO	Offline

8. Biology for Architects (Code – 210310)

Objective – The course aims to obtain understanding of the basic principles of biomimicry, and use of biomimicry in architecture, relation of biomimicry to building, skin and introduce students to principles of sustainability.

S. No.	Subject Cod	Subject Name	Categor y	Maximum Marks Allotted							Total Mark s	CT HRS	Contact Periods per week			Total Credi ts	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficienc y in subject/ course	Mid Sem.	Quiz/ Assign ment /Session al		Lab work & Sessional	Skill based mini project								
8.	**210310**	iology for Architect	MAC-1	50	10	20	20	-	-	-	100	2	2	-	-	Grade	PP	Blended* (2/1)

UNIT 1 INTRODUCTION TO BIOMIMICRY

History of biomimicry, Biomimetic, Bionics, various types of Biomimicry. Concept of Biomimicry Approaches to Biomimicry. Principles and levels of Biomimicry.

UNIT 2 NATURAL PATTERNS & BIOMIMICRY

Various patterns in nature, Understanding Biomimicry: theory and case studies, building elements as cells in biology, Patterns of Biophilia.

Exercise: Observe and sketch interesting natural patterns in nature. Using one pattern as inspiration, digitally draw the basic element and tessellate it using arrays (linear, polar) and grids (rectangular, triangular, hexagonal, etc.), creating variations similar to those observed in nature.

UNIT 3 SKIN: 3D PATTERNS & BIOMIMICRY

3D Patterns, use of 3D patterns in biomimicry, the impact of use of biomimicry on reducing the buildings energy consumption, buildings interaction with the environment.

Exercise: Develop 3D modeling skills by sculpting surfaces and wrapping patterns that adjust to varying conditions around the building.

UNIT 4 SUSTAINABILITY IN ARCHITECTURE

History, theory and types. Impact of the built environment on nature. Process of making construction process and maintenance of a building sustainable.

UNIT 5 INTEGRATING BIOLOGY IN DESIGN

Application of Biology in the design process along with design exercise to realize the process of discovering biological inspiration and its application.

COs & LOs for Biology for Architects Overall Course Outcome: Students will be able to understand the biological behaviour and inspiration for designing buildings and their methods of designing.			
CO1	Students will be able to **Define** basic elements and principles of biomimicry approaches	LO1	**Understand** elements of nature for the purpose of problem solving
		LO2	**Memorize** the historical concepts of biomimicry
		LO3	**Relate** concepts of biomimetic with built environment
		LO4	**Learn** principles of biomimicry
		LO5	**Express** in the form of presentations, concepts and approaches to biomimicry
CO2	Students will be able to **Analyse** natural environment and surrounding to achieve biomimicry in architecture	LO1	**Relate** cell as in science to the built form
		LO2	**Appraise** movements, stillness & patterns in nature
		LO3	**Summarize** established theories and concept like biophilia, prospect and refuge and more
		LO4	**Observe** natural elements as an inspiration for designs and composition
		LO5	**Compose** of basic natural element in digital or manual formats
CO3	Students will be able to **Experiment** three dimensional patterns to achieve low energy consumption in buildings	LO1	**Link** the three dimensional spaces, patterns with biomimetic architecture
		LO2	**Integrate** use of biomimicry for energy efficiency of buildings
		LO3	**Validate** with study of case examples for relationship between building and environment
		LO4	**Stimulate** textures, patterns inspired from nature, on and around built forms
CO4	Students will be able to **Apply** theories and concepts of sustainability to built form and surroundings	LO1	**Define** sustainability in each field incorporating architecture studies
		LO2	**Understand** the design philosophy behind the history of sustainable architecture
		LO3	**Infer** from various environmental impact assessment reports
		LO4	**Programme** building that are sustainable and have ease of construction
CO5	Students will be able to **Design** in and around the built structures, without harming our ecosystem	LO1	**Learn** of designing comfortable spaces
		LO2	**Apply** different strategies to achieve sustainable goals
		LO3	**Play** with locally available material according to site and design development
		LO4	**Build** a methodology to integrate biology in design

References:

1. Kohler, Matthias & Silke Langenberg, ed. Fabricate (2014 print, 2017 online) NA2543.T43 F33 2014 2014 gta Verlag digital fabrication, material-based design
2. Aksamija, Ajla Sustainable Facades: Design Methods for High- Performance Building Envelopes online ebook 2013 Wiley building envelopes
3. Aranda, Benjamin; Lasch, Chris Tooling NA2728 .A58 2006 2006 Princeton Architectural parametric design
4. Ball, Philip Nature's patterns: a tapestry in three parts. Shape online ebook (2nd edition of Self-made Tapestry) 2011 Oxford University Press biomimicry, pattern.

SECOND YEAR FOURTH SEMESTER

1. Architectural Design – IV (Code – 210413)

Objectives –

The course aims to obtain knowledge of Architecture as responding to Social issues such as community, Culture, religion, politics etc, designing for special groups such as the villagers, elderly, and the handicapped.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210413**	Architectural Design – IV	DC- 10	100	20	20	20	50	30	10	250	6	2	2	2*(1.5)	**7**	AO	Offline**

PROJECT 1(Prototype): VILLAGE SURVEY & RURAL HOUSING

Study of the physical, socio economic and cultural aspects of a selected village by conducting various surveys to understand the settlement pattern, housing stock and amenities that are existing or required – To understand the linkages between Occupation, Social structure and Religious beliefs and its physical manifestation in the form of the settlement – Identification of a suitable Design intervention that would improve the quality of life – Ex. Design of housing prototypes for a particular community / occupation using rural building materials & cost effective technology. Design exercise may include the design of any facility required such as Primary health center / Community hall / Farm training center, etc.

PROJECT 2(Prototype): DESIGN OF COMMUNITY FACILITIES

Community facilities –Design of Community hall, Nursing home, Youth hostel, Old age home etc., encourage the student to explore concepts of an agglomeration of simple spaces with particular emphasis on the special needs of elderly, handicapped etc. It also focuses on the bioclimatic approach to the design of the building envelope i.e. articulation of openings, choice of materials for roof & walls of different orientations etc. Concepts integrating the use of passive, active & hybrid solar technologies with the design proposals are encouraged.

PROJECT 3 (Prototype): Time bound Problems of 6 hours to 48 hours.

COs & LOs for Architectural Design – IV (Code –210401)

Overall Course Outcome: The course aims to obtain knowledge of Architecture as responding to Social issues such as community, culture, religion, politics etc, designing for special groups such as the villagers, elderly, and the handicapped.

CO1	Students will be able to **analyze** data collected with relevance to the project by identification of a suitable design intervention that would improve the quality of life.	**LO1**	**Explain** the Settlement pattern in village and socio-cultural, geographic and economic aspects that shape the built environment.
		LO2	**Analyse** design of any rural settlement that evolved organically over a period.
		LO3	**Analyse** housing typology, locally available materials, artisanship and integration of landscape with the built environment.
		LO4	**Explore** concepts of agglomeration of simple spaces with particular emphasis on the special needs of elderly, handicapped, etc.
		LO5	**Develop** presentation of concepts through 2D and 3D presentation including sketches and models.
CO2	Students will be able to **explore** concepts and agglomeration of simple spaces with particular emphasis on the special needs of elderly, handicapped, etc.	**LO1**	**Demonstrate** the learning of the previous study.
		LO2	**Collect** data from standards, case studies and site visits for the current project.
		LO3	**Analyse** data collected with relevance to the current project
		LO4	**Integrate** learning from other allied subjects to the design proposal
		LO5	**Complete** the architectural project with all given requirements for the given project.
CO3/CO4	Students will be able to **maximize** the potential of designing within the period.	**LO1**	**Understand** the application of the architectural design process for adequate scale projects of human habitat
		LO2	**Transform** the human behavioural needs into architectural program requirements
		LO3	**Analyse** the information on context and the human-space relationship
		LO4	**Compose** the architectural spaces in a design project in a given period.
		LO5	**Communicate** architectural drawings with the help of various mediums in a given period.

REFERENCES:

1. Time saver standards for building types, DeChiara and Callender, Mc Grawhill Company.
2. Neufert Architect's data, Bousmaha Baiche& Nicholas Walliman, Blackwell science ltd.
3. National Building Code – ISI.
4. Time saver standards for landscape architecture – Charles W Harris – McGraw Hill.
5. New Metric Handbook – Patricia Tutt and David Adler – The Architectural Press.

Note: Design exercises that explore Architecture as responding to Social issues such as community, culture, religion, politics etc. Students familiarize themselves with designing for special groups such as the villagers, elderly, and the handicapped.

Note: One design problem shall be given in the End Semester Examination. 6X2 hours examination.

2. Building Construction – III (Code – 210414)

Objectives –

The course aims to obtain knowledge of the preparation of concrete, construction methods, special concrete and concreting methods, the properties and its use in foundation, beams and slabs, various exterior finishes and advanced structural systems.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210414**	Building Construction –III	BSAE-	50	10	20	20	50	30	20	200	5	2	1	2*(1.5)	**6**	PP	2.

UNIT-1 BUILDING MATERIALS

Concrete: Various types of cement concrete, its properties, and uses. Proportioning of concrete, grading of aggregates, water-cement ratio, and workability of concrete, Estimating yield concreting. Formwork for concreting, mixing, transporting and placing, consolidating and curing of concrete. Types of Special concrete and concreting method, concrete block and its uses. Glass: Curtain walls & glass block construction

UNIT -2 RCC FOUNDATION

Introduction to RCC framed structures, concrete foundation: Types of footing – Isolated, combined, continuous, strip raft & piles. Pile foundation: Definition, functions, and Design factors. Tool equipment and plants for piling. Precast pile – timber, concrete, and steel Friction pile and bearing pile bore pile. Cast in situ & Steel and Concrete, Pile Cap

UNIT-3 BEAMS AND SLABS

Concrete slabs: One-way, two ways, continuous & cantilever. Detailing of Slabs: One-way slabs, 2-way slab, continuous, flat slab. Concrete beams: Singly reinforced, doubly reinforced, cantilever & continuous beams. R.C.C: Column, beams, slabs, lintel, chajja, staircase, canopy, coffer slab & pergola.

UNIT-4 RETAINING WALL, EXPANSION JOINTS, AND

Detailing of R.C.C. retaining wall. Expansion Joints: Walls, roofs, and flooring. Detailing of apertures (lintels, sunshades, arches). Study of Various types of precast concrete blocks, their extensive uses in Building construction. Exercises of the above through case studies and drawings of selected building types.

UNIT-5 CLADDING SYSTEMS & FINISHES

• Types of Cladding systems – Stone, timber, weatherboard, Fiber cement, Brick, Vinyl, Metal (aluminum composite panels (ACP), Precast concrete cladding panel, Curtain wall, Rain screen wall system. Exterior insulation & Finishes.

COs & LOs for Building Construction –III			
Overall Course Outcome: Students will be able to **understand** the preparation of concrete, construction methods, special concrete and concreting methods, the properties and its use in foundation, beams and slabs, various exterior finishes and advanced structural systems.			
CO1	Students will be able to **understand** the role of concrete in structure technology .	LO1	**Remember** basic concepts: Various types of cement concrete, its properties, and uses.
		LO2	**Learn** the proportioning of concrete, grading of aggregates, water-cement ratio, and workability of concrete,
		LO3	**Understand** the estimating yield concreting. Formwork for concreting, mixing, transporting and placing, consolidating and curing of concrete.
		LO4	**Analyze** the types of Special concrete and concreting method, concrete block and its uses.
		LO5	**Evaluating** role of concrete on site investigations, layout, site organization.
CO2	Students will be able to **understand** the technicality behind the foundation of a structure and its type.	LO1	**Learn** basic concepts regarding RCC framed structures, concrete foundations.
		LO2	**Understand** the types of footing – Isolated, combined, continuous, strip raft & piles.
		LO3	**Apply** the techniques of foundation on site investigations, layout, site organization.
		LO4	**Analyze** the types of footing – Isolated, combined, continuous, strip raft & piles on a project.
		LO5	**Draw** all the elements of footing and its type**.**
CO3	Students will be able to **analyse** different types of slab and its different types on a structure.	LO1	**Learn** basic concepts concrete slabs in a structure.
		LO2	**Understand** the detailing of Slabs and its type - One-way slabs, 2-way slab, continuous, flat slab.
		LO3	**Apply** the detailing of Slabs on site investigations, layout, and site organization.
		LO4	**Analyze** the types of slabs one-way slabs, 2-way slab, continuous, flat slab on a project.
		LO5	**Draw** all the elements of slab and its type.
CO4	Students will be able to **demonstrate** their understanding through application in working drawing of basements ,retaining wall expansion joints.	LO1	**Remember** basic concepts regarding detailing of R.C.C. retaining wall..
		LO2	**Learn** the expansion Joints: Walls, roofs, and flooring..
		LO3	**Understand** the detailing of apertures (lintels, sunshades, arches).
		LO4	**Analyze** the various types of precast concrete blocks, their extensive uses in Building construction.
		LO5	**Evaluating** through case studies and drawings of selected building types.
CO5	Students will be able to **analyse** different finishing material in a project	LO1	**Learn** basic types of cladding material.
		LO2	**Understand** its uses on a project.
		LO3	**Apply** it on a given live project.
		LO4	**Analyze** the market survey of different types of cladding material available in the market.
		LO5	**Evaluating** through case studies and drawings of selected building types.

REFERENCES:

1. Dr. B.C Punmia – Building construction (10th edition) - Laxmi Publications
2. Roy Chudley (Author), Roger Greeno (Author) -construction Technology, 4th Edition
3. Francis D.K.Ching – Building Construction illustrated, 4th edition, 2015
4. M.S Shetty, concrete Technology, S.Chand publishing
5.

Note: Total five questions shall be asked. Each question will consist of two parts, one of which will be of 7 marks (which shall be compulsory) and another with 3 marks(which shall be optional).

3. Building Services-I (Water supply & Sanitation) (Code – 210415)

Objectives –

The course aims to obtain knowledge of water supply and waste water management, in residential units, small campus, and commercial buildings, plumbing layouts for various building typology, and best practices for Solid waste management.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210415**	Building Services-I (Water Supply & Sanitation)	BSAE-	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Offline***

UNIT-1 WATER SUPPLY

Sources of water supply – Water Quality - Water requirements for different types of buildings and for town, simple method of removal of impurities, pit. System of supply - continuous and intermittent supply, sump, overhead tanks, pumps, distribution pipes, cold water and hot water supply for single and multi-storied buildings. Pipes sizes, types – GI, CPVC, Copper, Cast Iron (CI) Pipes, Steel Pipes, Asbestos Cement (AC) Pipe, Concrete Pipes fittings, valves, and types of taps.

Rainwater harvesting to include roof top harvesting, type of spouts, sizes of rainwater pipes and typical detail of a water harvesting. Surface water runoff

UNIT-2 DRAINAGE AND SEWAGE DISPOSAL

Recycling/Reuse of Wastewater, Systems of drainage – separate, combined and partially separate system, surface drainage, sizes and construction, system of plumbing - single stack, one pipe system, one pipe partially ventilating system and two pipe system.

House drainage – principles, traps-floor trap, multi-trap, gully trap, grease and oil trap,: Anti Siphonage pipe, Types of fixtures and materials, Arrangements of fixtures in a bathroom. Design of Septic tank, Treatment and disposal of septic tank effluents – Design of soak pit and dispersion trench, Biological filter, up flow anaerobic reactors

Sewage treatment technologies: Activated sludge process, Membrane bioreactors, packaged treatment plants, Root zone treatment system, Decentralized Wastewater Treatment Systems (DEWATS), Soil Bio technology

UNIT-3 SOLID WASTE DISPOSAL

Solid waste management: Generation of Solid waste, Collection & Transportation of solid waste to the secondary/ locality storage/community bins, Storage of solid waste at locality level, Transport of solid waste to dumping sites and treatment plants, Treatment and Dumping of Solid Waste, Methods of Disposal of solid waste

Approaches to Solid Waste Management: Waste minimization / reduction at source, recycling, waste processing (with recovery of resources and energy), waste transformation (without recovery of resources) and disposal on land.

UNIT-4 EMERGING PROCESSING TECHNOLOGIES

Emerging processing technologies : Vermicomposting, Biogas from MSW, Pyrolysis (including plasma arc technology), refuse derived fuel, Bioreactor landfill - Biomethanation plant at koyambedu, wholesale vegetable market Chennai, Door-to-door collection, transportation and waste processing services by Exnora Green pammal.

UNIT-5 PLUMBING LAYOUT OF SIMPLE BUILDINGS

Designing of toilet blocks in residential and public buildings, showing complete details of fittings and plumbing required for water supply and drainage.

Designing and preparing a complete water supply and drainage layout of an academic Architectural design project, with all required calculations.

COs & LOs for BUILDING SERVICES-I

Overall Course Outcome: The overall aim of the course is to introduce students to the various water supply and sanitation systems in building of various scales and also to make them understand plumbing layouts, knowledge of plumbing and sanitation fixtures and their sustainable applications in buildings.

CO1	Students will be able to **identify** the significance of water supply in urban and rural areas, its methods and requirements.	LO1	**Define** the need of water supply and water requirements in different types of buildings.
		LO2	**Observe** the methods of water supply in metropolitan areas, methods of rainwater harvesting in buildings.
		LO3	**Identify** the types of apparatus required for water supply, sizes, availability, capacity and energy required to install water supply systems in a building.
		LO4	**Evaluate** the sustainable methods in the process.
CO2	Students will be able to **develop** the understanding of drainage systems in buildings and its application	LO1	**Define** the types of sanitary wastes generated in various types of building and methods of disposal,
		LO2	**Observe** the types of drainage systems, and methods of recycling various types of wastes (dry or wet)
		LO3	**Identify** the types of apparatus required for drainage and sanitation fixtures, sizes, availability, capacity and energy required to install drainage systems in a building.
		LO4	**Evaluate** the requirements of septic tanks, waste water recycling systems
CO3	Students will be able to **analyse** the significance of solid waste management in cities and their sustainable methods	LO1	**Define** the types of solid wastes generated in various types of buildings
		LO2	**Observe** the methods of waste segregation, their classification and methods of disposal.
		LO3	**Identify** process of waste at city level, locality and approaches to waste management
		LO4	**Analyse** sustainable methods of waste management in cities.
CO4	Students will be able to **evaluate** the sustainable methods of processing solid waste and strategies for waste management at city level	LO1	**Compare** the existing trends in waste recycling and waste disposal in cities
		LO2	**Analyse** the significance of vermin composting, biogas, recycling units etc. and their application
		LO3	**Evaluate** the strategies for waste management at metropolitan level through case studies
CO5	Students will be able to **compare** and develop the plumbing layout of various types of building.	LO1	**Evaluate** the plumbing layout of any existing building
		LO2	**Evaluate** the drainage layout of any existing building
		LO3	**Prepare** the sanitation and plumbing layout for buildings of various scales

REFERENCES:

1. Birdie G. Sand Birdie J. S Water Supply & Sanitary Engineering, Dhanpat Rai Publishing Company (p) Ltd (2010)
2. Sanitary Engineering by R S Deshpande
3. S. K. Garg , Water Supply Engineering: Environmental Engineering v. khanna publishers 2010
4. Charangith shah, Water supply and sanitary engineering, Galgotia publishers.
5. Kamala & DL Kanth Rao, Environmental Engineering, Tata McGraw – Hill publishing company Limited.
6. Technical teachers Training Institute (Madras), Environmental Engineering, Tata McGraw Hill publishing Company Limited.
7. M.David Egan, Concepts in Building Fire Safety.
8. V.K.Jain, Fire Safety in Building 43
9. National Building Code 2005.
10. Toolkit for Solid Waste Management, Jawaharlal Nehru National Urban Renewal Mission, November 2012, Ministry of Urban Development Government of India.

4. History of Architecture-IV (Code- 210416)

Objectives –

The course aims to obtain knowledge of Design philosophies of colonial, post independent and contemporary architecture in Indian context, modern design philosophies in the evolution of innovative architectural forms and designs, the effect of industrial revolution on architecture.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210416**	History of Architecture-IV	DC- 11	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 INDUSTRIAL REVOLUTION

Impact of the Industrial Revolution on Architectural practices. Transformation from iron to steel and the demand for a new Architecture.

UNIT -2 MODERNISM

Context of Origin; Characteristics; Key Movements – Arts and Crafts, Constructivism, Bauhaus, Expressionism, International Style, Minimalism, Brutalism. Works of notable conforming Architects: Frank Lloyd Wright, Ludwig Mies van der Rohe, Le Corbusier, Walter Gropius, Oscar Niemeyer and Alvar Aalto.

UNIT-3 DECONSTRUCTIVISM

Origin and influences breaking away from Modernism and Postmodernism, Deconstructivist philosophy. Influence on Architectural practice; Works of notable conforming Architects: Frank Gehry, Daniel Libeskind, Rem Koolhaas, Peter Eisenman, Coop Himmelb(l)au, and Bernard Tschumi.

UNIT-4 NEO-MODERNISM AND OTHER POST-POST MODERN REACTIONS

Origin and Characteristics, Other associated movements: Metamodernism, Re-modernism, Neo-futurism, Neo- Historicism. Works of Richard Meier, Charles Gwathmey, I.M. Pei, Tadao Ando, ZahaHadid, and Santiago Calatrava.

UNIT-5 COLONIAL, POST COLONIAL CONTEMPORARY INDIAN ARCHITECTURE

Architecture in colonial India and post independence, Indo-Saracenic Architecture, Modernism and Works of notable contemporary Architects.

COs & LOs for HOA – IV			
Overall Course Outcome: Students will be able to **develop** an appreciation of various architectural movements, revolutions & styles across the globe, its chronology, typology and the resulting architectural forms that are unique in time and place.			
CO1	Students will be able to **apply** Industrial revolution architectural expressions in their own design.	LO1	**Learn the evolution** of the Industrial revolution and its relation with architecture.
		LO2	**Understand** diverse artistic and architectural expressions in various periods of Industrial revolution.
		LO3	**Illustrate** visual and verbal vocabularies of Industrial revolution.
		LO4	**Analyze** Industrial revolution forms and space through various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms and styles of Industrial revolution.
CO2	Students will be able to **apply** elements of modernism style in Architecture in their own design.	LO1	**Learn** evolution of modernism style in Architecture.
		LO2	**Understand** diverse artistic and architectural character in modernism style in Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of modernism style in Architecture.
		LO4	**Analyze** modernism style in architecture through forms and space and various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms of modernism style in Architecture.
CO3	Students will be able to **apply** elements of Deconstructivist style in Architecture in their own design.	LO1	**Learn** evolution of Deconstructivist style in Architecture.
		LO2	**Understand** diverse artistic and architectural character in De-constructivism style in Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of De-constructivism style in Architecture.
		LO4	**Analyze** De-constructivism style in Architecture through forms and space and various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural forms of De-constructivism style in Architecture.
CO4	Students will be able to **apply** elements and concepts of Neo-modernism & Postmodernism reactions in Architecture in their own design.	LO1	**Learn** evolution of Neo-modernism & Postmodernism reactions in Architecture.
		LO2	**Understand** diverse artistic and architectural character in Neo-modernism & Postmodernism reactions in Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Neo-modernism & Postmodernism reactions in Architecture.
		LO4	**Analyze** Neo-modernism & Postmodernism reactions in architecture through forms and space and various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various forms of Neo-modernism & Postmodernism reactions in Architecture.
CO5	Students will be able to **apply** elements of Colonial, Post-Colonial & Contemporary style in Indian Architecture in their own design.	LO1	**Learn** evolution of Colonial, Post-Colonial & Contemporary style in Indian Architecture.
		LO2	**Understand** diverse artistic and architectural character in Colonial, Post-Colonial & Contemporary style in Indian Architecture.
		LO3	**Illustrate** visual and verbal vocabularies of Colonial, Post-Colonial & Contemporary style in Indian Architecture.
		LO4	**Analyze** Colonial, Post-Colonial & Contemporary style in Indian Architecture through forms and space and various examples.
		LO5	**Reproduce** with help of sketches/visuals (softwares)/3D (models) of various architectural Colonial, Post-Colonial & Contemporary style in Indian Architecture.

REFERENCES:

1. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London.
2. Sigfriedgiedion, .Space time and Architecture: The Grwoth of a New Tradition, Harvard University Press.
3. Tzonis Alexander, Santiago calatrova , International Publications, January 2005, New York.
4. Steele James, Hassan fathy - The complete works , London : Thames and Hudson.

5. Structures-IV (Code – 210417)

Objectives –

The course aims to obtain knowledge about the structural behavior of various types of steel structural systems those are commonly employed in the building construction industry presently, methods those are used to design a steel structural system for a specific condition & loading. Interpretation of structural detail drawings in the site is also intended.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210417**	Structure -IV	BSAE-10	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Offline***

UNIT- 1 PROPERTIES OF STEEL SECTIONS & TYPES OF CONNECTIONS

Introduction Properties of Indian standard rolled steel section – Use of IS 800 and steel tables – Permissible and stresses in tension, compression and shear. Connections: Welded and bolted connections – Types of failure – Design of welded and bolted connections for members subjected to axial forces. Site visit to a steel fabrication unit.

UNIT-2 TENSION AND COMPRESSION MEMBERS

Steel structures – Identification of tension and compression members in trusses & girders– Understanding the process of design of single angle and double angle sections in tension– understanding the method to design compression members – signify chance of Slenderness ratio– Design of simple and compound sections (Theory only) – Design of lacings and battens.

UNIT -3 STEEL BEAMS

Identification of principal & secondary beams in a structural system - Allowable stresses in Principal beams, General specifications for steel beams, Understanding the design process for simply supported & cantilevered beams – Comprehending the design of laterally supported beams.(Simple problems).

UNIT-4 STEEL TRUSSES & GIRDERS

Study of the various types of roof trusses & where a particular truss can be used – Selection of trusses according to the span – Estimation of gravity loads and wind loads on roof – Use of BIS and book SP-38 in analyzing and design of trusses – gusseted plate connections (Theory Only).

UNIT-5 INTRODUCTION TO LONG SPAN STEEL STRUCTURAL SYSTEMS

Space frame structural system in tubular steel – various types of connectors – single / double & triple grid space frames and the span for which they can be employed – various types of space frame configurations. Tensile structural systems using steel cables – Examples of space frame & tensile structural systems.

COs & LOs for Structure - III			
Overall Course Outcome: Students will be able to understand the structural behaviour of steel in construction of buildings and their methods of designing.			
CO1	Student will be able to **understand** the behaviour of steel in construction, its forms and use in different structures	LO1	**Learn** the common properties of structural steel
		LO2	**Identify** the types of stresses in steel construction
		LO3	**Outline** the features of IS code provisions regarding use of steel in construction
		LO4	**Evaluate** the details for welded connections in steel construction and types of failures in design of steel structure
		LO5	**Asses** the working of structural details through site visit
CO2	Student will be able to **understand** the methods of designing angle sections, single and compound sections, compression members, lacings and battens	LO1	**Identify** the types of tension and compression members in steel trusses and girders
		LO2	**Analyse** the methods of designing angle sections in tension members, compression members and design of lacing and battens
		LO3	**Outline** the features of IS code provisions for designing with steel members
		LO4	**Interpret** the working details of tension and compression members in steel construction
		LO5	**Asses** the working of design through site visit
CO3	Student will be able to **comprehend** the design of principle and secondary beams in steel construction	LO1	**Learn** the principle and secondary beams in structural systems
		LO2	**Outline** the general specifications for steel beams
		LO3	**Evaluate** the load considerations for design of beams and lintel in RCC structures
		LO4	**Interpret** the design process for cantilever and simply supported beams in steel construction and design of laterally supported beams through solving simple problems
		LO5	**Asses** the working of structural details through site visit
CO4	Student will be able to **comprehend** the types, selection, estimation of load and designing of steel trusses and girders for construction	LO1	**Understand** the use of steel girders and its types
		LO2	**Analyse** selection of trusses on the basis of span of roof
		LO3	**Outline** the features of IS code provisions for design of trusses
		LO4	**Evaluate** the various loads and typical structural details for design of steel trusses and girders along with load considerations
		LO5	**Asses** the working of structural details through site visit
CO5	Student will be able to **learn** about the use of steel in construction of various long span structures	LO1	**Classify** the types of long span structural systems in steel
		LO2	**Identify** the connectors in space frame structures and types of space frame configurations
		LO3	**Evaluate** the applications of space frame structures and tensile structures through examples
		LO4	**Interpret** the typical structural details for tubular steel and steel cables
		LO5	**Asses** the working of structural details through site visit

REFERENCES:

1. Ramachandra .S Design of steel structures Vol. I, Standard publication, New Delhi, 1992
2. Vazirani V.N, and Ratwani M.M, Steel structures, Khan
3. Handbook of Typified Designs for Structures with steel roof trusses, SP 38 (S&T) – 1987, BIS, New Delhi, 1987
4. Code of practice for Earthquake Resistant Design and Construction of Buildings IS4326-1976, BIS, New Delhi.

6. **Elective – I ECOLOGY & ENVIRONMENT (210421) & SOCIETY, CULTURE & ARCHITECTURE (210422)**

Objectives –

The course aims to obtain knowledge about ecology, society, culture, environment, the use of ecology, etc. in architecture design and site planning.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	-	ELECTIVE –I	DE- 1	50	10	20	20	-	-		100	4	2	-	2	**3**	PP	Blended* (2/1)

(i) ECOLOGY & ENVIRONMENT (210421)

UNIT-1 INTRODUCTION TO THE STUDY OF ECOLOGY & ENVIRONMENT

Introduction, Structure and Function: Introduction to ecology, its meaning and growing importance in daily life. Basic terms used in ecology and their meanings. Fundamental concepts of ecology. Ecology – Environment relationship. Concept of spaceship as earth. Structure and function of eco- system, Eco- system equilibrium, natural cycles, ecological footprint, climate change

UNIT-2 RELATIONSHIP WITH NATURE:

Man's relationship with nature in the present: Industrial activities, urbanization, deforestation, mining and similar incursions on nature for technological progress. Environmental impacts of these activities. The ecological crisis.

UNIT-3 IMPORTANCE OF ECOLOGY

Importance of Ecology: Relevance and growing importance of ecology in a highly urbanized and technological world with reference to dwindling resources, increasing demands and advancing technology. Adaptation of life- styles, and adoption of alternate technologies to harmonize with the natural environment. Discussion on alternatives available. Guiding environmental principles

UNIT-4 ECOLOGICAL APPLICATIONS TO ARCHITECTURE AND PLANNING

Ecological applications to Architecture and Planning. Preserving and improving human settlement in harmony with nature. Conservation of natural resources for improving the quality of life on earth and attempting to ensure its continuity for the future of humanity. Eco cities, eco- communities and eco buildings: Archeology.

Designing settlements and other man-made eco- systems. Ecological and environmental cities for a sustainable future.

UNIT-5 ECOLOGY AND ENVIRONMENT FOR SUSTAINABLE FUTURE.

Eco building materials and construction – Biomimicry, Low impact construction and recyclable products and embodied energy. Life cycle analysis. Energy sources-Renewable and non- renewable energy.

COs & LOs for Ecology & Environment			
Overall Course Outcome: The basic objective of this course is to develop the student's understanding towards the importance of ecological studies and environmental protection from rapidly growing anthropogenic activities. This course would let the students explore various architectural techniques in mitigating environmental degradation and achieving sustainable living.			
CO1	Students will be able to **summarize** elementary knowledge to earth's natural environment	LO1	**Define** basic terms used in Ecology and Environmental Science.
		LO2	**Outline** the relationship between Ecology and Environment.
		LO3	**Analyze** the concept of Spaceship as Earth with the context of existing scenarios.
		LO4	**Conclude** the various factors impacting environmental degradation, climate change, carbon footprint, etc.
CO2	Students will be able to **highlight** emerging human activities creating serious environmental degradation.	LO1	**List** various human activities since industrialization till date impacting nature.
		LO2	**Demonstrate** impact of such activities with the help of suitable case examples
		LO3	**Analyze** the relationship between man and its natural surroundings, focusing on negative impacts of manmade activities on the environment.
		LO4	**Evaluate** the need of environmental protection and economic activities
CO3	Students will be able to **relate** urban ecology with sustainable technologies.	LO1	**Define** ecology in terms of growing urbanization and technological advancement
		LO2	**Summarize** the need of alternative technologies to harmonize nature.
		LO3	**Develop** environmental sensitivity
		LO4	**Examine** application of available alternatives
CO4	Students will be able to **perceive** the role of an architect/planner in sustainable development	LO1	**Recall** harmony with nature in order to preserve and improve human settlement
		LO2	**Illustrate** the application of ecology by explaining man-made ecosystem and re/designing settlements
		LO3	**Apply** various practical applications of ecology in the field of architecture and planning
		LO4	**Inspect** the terms- Eco cities, eco- communities and eco buildings for sustainable future
CO5	Students will be able to **adapt** various green/sustainable architectural techniques in one of the student's design problem	LO1	**List** various eco-building materials and construction techniques
		LO2	**Design** with innovative methods by using sustainable materials/techniques to reduce the impacts of construction and urbanization.

REFERENCES:

1. Fundamentals of Ecology by E.P. Odum
2. The Ecology of Man: An Ecosystem Approach by Robert Leo Smith
3. Introduction to Ecology by Kurmundi
4. Review Our Dying Planet by Sarala Devi
5. Ecological Crisis: Reading for Survival by G. A. Love & R.M. Love

(ii) SOCIETY, CULTURE & ARCHITECTURE (210422)

UNIT-1 CULTURE

Fundamentals of sociology and its relationship to architecture. Culture and social identity with reference to architecture. Fundamentals of society, culture and politics with reference to architectural history. Forms of social organization in history. Various definitions of culture and civilizations

UNIT-2 ARCHITECTURAL TRADITIONS

Cosmological models and architectural form. Articulation of people and built environments. House form and communication. Asian traditions in architecture. Concept of vernacular Architecture

UNIT-3 SOCIETY AND CIVILISATION

Architecture and its context. Social and cultural aspects of building practices. Architecture-expression of power. Architecture as an agent of change. Architecture as an identity

UNIT-4 INDIGENIZATION AND CULTURAL CHANGE

Transformations and changes in forms of historical architecture. Localization and globalization –cases and examples. Loss of architectural identify and role of culture

UNIT-5 ARCHITECTURAL REJUVENATION

Definition of Renewal, transformation, redevelopment, rejuvenation in architectural context and basic concepts

COs & LOs for Society, Culture And Architecture (210412)

Overall Course Outcome: The course aims to obtain knowledge about society, culture, environment, etc. in architecture design and site planning.

CO1	Students will be able to **relate** sociology with architecture and planning	LO1	**Define** various cultures and civilizations
		LO2	**Explain** fundamentals of society, culture and politics with reference to architectural history
		LO3	**Discover** forms of historical social organization
		LO4	**Identify** relationship of sociology and architecture
CO2	Students will be able to **inspect** basics of traditional architecture	LO1	**Define** different architectural forms and models
		LO2	**Illustrate** the supremacy of people on their neighboring built environment
		LO3	**Inspect** the influence of asian tradition on its architectural style
		LO4	**Analyze** the concept of traditional architecture
CO3	Students will be able to **illustrate** the site specific nature of architectural design	LO1	**Recall** architecture and its context
		LO2	**Outline** social and cultural aspects of building practices
		LO3	**Determine** architecture as an powerful agent to bring changes in society and culture
		LO4	**Conclude** architecture as an identity of a place/site
CO4	Students will be able to **distinguish** cultural change and indigenous architectural practices	LO1	**Illustrate** transformation of architectural form over a period
		LO2	**Analyze** globalization and localization with the help of suitable examples
		LO3	**Interpret** the role of culture and its impact on architectural identify
CO5	Students will be able to **apply** rejuvenation in architecture	LO1	**Define** basic terms of architectural rejuvenation
		LO2	**Categorize** concept of renewal, transformation, redevelopment, rejuvenation in architectural context

REFERENCES:

1. Conformity and Conflict: Readings in Cultural Anthropology by McCurdy, David W., Dianna Shandy, and James Spradley, eds.
2. Case examples of research on cultural anthropology
3. Field studies of communities
4. House, Form and Culture by Amos Rapoport
5. Case studies of various examples on social and cultural issues relating to architectural history in India and world.
6. Architecture in Cultural Change: Essays in Built Form and Culture Research by David G. (ed). Saile (Author)

7. Tour/ Seminar / Workshop/ NASA Training during winter break (Code – 210419)

S. No.	Subject Cod	Subject Name	Categor y	Maximum Marks Allotted							Total Mark s	CT HRS	Contact Periods per week			Total Credi ts	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficienc y in subject/ course	Mid Sem.	Quiz/ Assign ment /Session al		Lab work & Sessional	Skill based mini project								
8.	**210419**	our/ Seminar / Vorkshop/ NASA raining during wint reak	SEC- 5	-	-	-	-	50	-		50	2	-	-	2	**1**	SO	Offline

8. INDIAN CONSTITUTION (Code – 100006)

S. No.	Subject Cod	Subject Name	Catego ry	Maximum Marks Allotted							Total Mark s	CT HRS	Contact Periods per week			Total Credi ts	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficienc y in subject/ course	Mid Sem.	Quiz/ Assign ment /Session al		Lab work & Sessional	Skill based mini project								
9.	$**100006**	Indian constitution	MAC- 2	50	10	20	20	-	-	-	100	2	2	-		Grad e	MCQ	Online

THIRD YEAR FIFTH SEMESTER

1. Architectural Design – V (Code – 210514)

Objectives –

The course aims to obtain knowledge Architecture as a design response to the culture of a place, artistic expressions with common building materials such as brick, concrete, steel & glass, building components using the same building material, designing various services and spaces required specifically for a particular use.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210514**	Architectural Design – V	DC- 12	100	20	20	20	50	30	10	250	8	2	3	2*(1.5)	**8**	AO	Offline**

PROJECT I: MATERIAL STUDIO

Studio project: Cultural Center / Multiplex with mall. The cultural center project exposes the student to the design issues such as effects by manipulating day light in the art gallery space, designing for clear sight lines and sound in the auditorium space & optimizing day light for reading in the library space. The additional challenge is to create spaces for fine arts & performing arts by creating artistic expressions with building materials such as brick, concrete etc. The multiplex project expects the student to the design issues involved in entertainment spaces such as cinema halls and the challenges in creating commercial spaces such as food courts, shops, gaming parlours etc. Moreover, it exposes the student to contemporary materials such as steel, aluminum & glass.

PROJECT II: HEALTHCARE BUILDINGS

Hospitals and Nursing homes are a special category of buildings where functional aspects such as planning, building services & the creation of a sterile environment become important design issues. This project aims to familiarize the student with the design of critical health care spaces such as operation theatres, diagnostic facilities, outpatient department and inpatient rooms. The modern trends in hospital design challenge the architect to create world class ambience.

PROJECT 3 (Prototype): Time bound Problems of 6 hours to 48 hours.

COs & LOs for Architectural Design – V (210501)

Overall Course Outcome: The course aims to obtain knowledge Architecture as a design response to the culture of a place, artistic expressions with common building materials such as brick, concrete, steel & glass, building components using the same building material, designing various services and spaces required specifically for a particular use.

CO's	The course should enable the student to: ● Familiarize with given topic of design by choosing appropriate case studies through visits and documentation. ● Understand the resources available at	LO1	Analyze the culture of a place – building types such as the cultural center comprising of spaces such as the art gallery, auditorium for performing arts, library etc.
		LO2	Identify the various common building materials such as brick, concrete, steel & glass.
		LO3	Examine the same building material through Material studio.
		LO4	Illustrate with materials to find suitable artistic & commercial expressions and the learning of design methods for healthcare buildings.

	National and international level through books, literatures and websites. ● Develop design ideas and create them.	LO5	Design commercial buildings integrating entertainment spaces, where the student is given exposure to the finer aspects of auditorium design.
		LO6	Express the design with drawings and model to support the concept.

REFERENCES:

1. Richard Weston, Plan sections & elevations of key buildings of the 20th century, Lawrence king publishing, London,2004.
2. Time saver standards for building types, De Chiara and Callender, McGraw hill company
3. Neufert Architect's data, Bousmaha Baiche& Nicholas Walliman, Blackwell science ltd.
4. National Building Code – ISI
5. Time saver standards for landscape architecture – Charles W Harris – McGraw Hi

2. Building Construction –IV (Code – 210515)

Objectives –

The course aims to obtain knowledge of detail the various materials used in construction, various advanced structural components, modern masonry units, and its components, types of insulation and temporary structures.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210515**	Building Construction –IV	BSAE-11	50	10	20	20	20	20	10	150	5	2	1	2*(1.5)	**6**	PP	Blended** (3/3)

UNIT-1 BUILDING MATERIALS –IV

• Steel: Properties and uses of cast iron, wrought iron, pig iron, and steel.

• Market forms of steel: Structural steel, stainless steel, steel alloys – properties and uses.

UNIT -2 STEEL

• Steel trusses – Sawtooth roof truss with north light glazing, simple trusses in steel, and types of connections – to foundations, steel stanchion, and beams.

• Space frames:-Single, double & triple-layered tubular space frames, Gates: collapsible gate, entrance gate, rolling shutter.

• Steel components: Steel doors, (hinged, fixed sliding, sliding &folding& Revolving door. steel windows (casement window & sliding window) Steel stairs (dog-legged, spiral stair) steel handrails and balustrade grill designs for windows, main gate design.

UNIT-3 WALL & FLOOR

• Wall: Modern masonry units - Fly ash brick, Aerated concrete blocks, Hollow concrete blocks &Hollow clay blocks

• Floor finishes– Indian patent stone (IPS), Terrazzo flooring, Granolithic flooring stone flooring, Resilient flooring & Carpeting.

UNIT-4 PARTITIONS & FALSE CEILING:

• Simple paneled and glazed partitions: Timber, Glass, Aluminium & PVC.

• Falseceiling: False ceiling of interior spaces using wood panels, glass, Thermacol, gypsum board, plaster of Paris, aluminum strips & perforated metal sheets.

• Jam casing, skirting, molding, architrave & pelmet

UNIT-5 THERMAL INSULATION AND ACOUSTICS INSULATION

• Thermal insulation: vapor barriers and rigid insulations, blanket, poured and reflective insulation– properties and uses of spun glass foamed glass, cork, vegetable fibers Gypsum plaster of Paris, hydride gypsum properties and their uses.

• Acoustics insulation: porous, baffle and perforated materials such as Acoustic plastic, Acoustic tiles,wood, partition board, fiberboard, cook, quilts and mats – their properties and uses – current developments. Applications of the above insulations in seminar hall, theatre, and cold storage.

COs & LOs for Building Construction – IV (210502)

Overall Course Outcome: The course aims to obtain knowledge of detail the various materials used in construction, various advanced structural components, modern masonry units, and its components, types of insulation and temporary structures.			
CO1	As a result of studying properties and uses of cast iron, wrought iron, pig iron and steel, student will be able to understand market forms of steel in depth.	LO1	**Learn** Properties and used of cast iron, wrought iron, pig iron and steel.
		LO2	**Understand** the material and construction techniques through site visit and market surveys
		LO3	**Develop** a fundamental understanding of the relationship of materiality to construction systems and techniques
		LO4	**Analyze** The detail of materials with different combinations in buildings.
		LO5	**Produce** construction detail of Steel sections and connections.
CO2	As a result of studying about steel, student will be able to understand the components of steel used in building in various forms with respect to the design.	LO1	**Learn** the terminology of trusses, frames and other steel components in building.
		LO2	**Understand** the need of various types of trusses and frames in building.
		LO3	**Develop** a fundamental understanding of types of trusses and frames in steel in a building.
		LO4	**Analyze** the details of various trusses and frames in building.
		LO5	**Produce** details of various trusses, frames, doors and windows.
CO3	As a result of studying about modern masonry units and floor finishes, student will be able to make use of these details in building construction.	LO1	**Learn** types modern masonry units and floor finishes.
		LO2	**Understand** the difference between the materials used for modern masonry units and floor finishes.
		LO3	**Analyze** types of masonry units and floor finishes.
		LO4	**Understand** the details of the above.
		LO5	**Produce** construction details of walls with modern masonry units and floor finishes.
CO4	As a result of Studying about false ceiling, student will be able to understand how wires can be concealed, sound proofing and energy efficiency.	LO1	**Understand** simple panelled, glazed partitions and false ceiling.
		LO2	**Identify** suitable material required for the construction of doors, windows, ventilator, arches etc.
		LO3	**Classify** the components based on their arrangements, method or manner of construction.
		LO4	**Design** interior wall panelling and suspended ceiling detail drawings
		LO5	**Produce** the drawings of simple panelled and glazed partitions.
CO5	As a result of studying about thermal ad acoustics insulation, student will be able to make use of various material wrt to building type.	LO1	**Understand** thermal insulation and acoustics insulation.
		LO2	**Identify** methods in which thermal and acoustics can be achieved.
		LO3	**Classify** the components and terminology.
		LO4	**Summarize** thermal insulation techniques, acoustical treatment details for different spaces.

REFERENCES:

1. W.B. Mckay – Building construction Vol. 1 (5th edition), Vol. 2 (4th edition) and Vol. 3 (5th edition)
2. R.Chudley &R. Greeno – Building Construction Handbook, ninth edition
3. Francis D.K. Ching – Building Construction illustrated, 4th edition, 2015
4. R.Chudley &R. Greeno – Building Construction Handbook, ninth edition
5. Arthur Lyons, Materials for Architects and Builders – Oxfordshire, England, New York : Routledge, 2014
6. Don A.Watson, construction materials and process, McGraw Hill Co, 1972

7. Stephen Emmitt, Christopher A. Gorse - Barry's Advanced Construction of Buildings, 3rd Edition
8. The American Institute of Architects - Architectural Graphics standards – 11th edition

Note: Total five questions shall be asked. Each question will consist of two parts, one of which will be of 7 marks (which shall be compulsory) and another with 3 marks(which shall be optional).

3. Building Services-II (Electrical & Mechanical) (Code – 210516)

Objectives –

The course aims to obtain knowledge of various services in a building such as electrical, illumination, etc., an understanding of layouts of electrical, plumbing, AC ducts, lighting, etc., Air conditioning system and its working.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210516**	Building Services-II (Electrical & Mechanical)	BSAE-12	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 ELECTRICAL SERVICES

Electrical systems – Basic of electricity – single/Three phase supply , Electrical installations in buildings – Types of wires, Wiring systems and their choice, planning electrical wiring for building – Main and distribution boards, HT transformers, electrical panel rooms, cable trenches, controls, Circuits, fuses, main switch box, meter box, circuit breakers. Uninterrupted power supply, inverters, protective devices in electrical installation – Earthing for safety – Types of earthing – ISI Specifications, Lighting protection Electrical installations in various building types, Residential bungalow, apartments, commercial recreational buildings and factory buildings etc. Market survey of Electrical materials and electrical appliances.

UNIT-2 ILLUMINATION AND LIGHTING DESIGN

Principles of Illumination: Basics of Lighting Technology and Terminology, Classification of lighting–Artificial light sources. Systems of lighting such as direct, indirect, diffused etc.,

Design of modern lighting: Lighting for stores, offices, schools, hospitals and house lighting.Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types. Seeing light: learn about vision and perception, color, and - understanding shade and shadow Light fixture :Controlling light, luminaire optics and distributions - introduction to light fixture materialsand construction, and components Light in Architecture and the Psychology of Light,

Lighting Design Concepts, Lighting in terms of energy efficiency, ergonomic aspects and aesthetic aspects. Light a surface: Horizontal and vertical - present various approaches and techniques - finding lightfixtures. For a Task - present various approaches and techniques, simple lighting effects.

Calculating Light: learn light metrics and calculation methods - review energy and the environment Lighting calculations Lighting Design :Residential lighting, Office and Corporate Lighting, Hospitality Lighting Design, Health Care/Institutional Lighting Design, Lighting for Stores, Lighting Common Spaces

UNIT-3 AIR CONDITIONING

Components of an air-conditioning system & their function-Refrigeration cycle, different systems of AC, window, split, small standalone unit, and air cooled direct expansion system used for auditorium spaces, chill water systems with air handling units, estimating the cooling load of different spaces in a building with simple calculation, duct lay out for both types of systems. Intelligent building systems in air conditioning, Sick building syndrome, effect of pollutants, improving air quality in air-conditioned buildings.

UNIT-4 PUMPS AND MACHINERIES

Pumps: Different types of Pumps, working, applications. Water pumps, sewage pumps, Centrifugal,Reciprocating pump, turbine (diagrams & functioning only)

Compressors: Different types of Compressors and their applications.

Lifts And Escalators : Elevators (Lifts) and escalators–Brief history-types of Elevators like traction,Hydraulic etc., Double-decker, sky lobby, lift lobby, lift interiors etc., Definition and components Elevatoring a building: environmental considerations i.e., location in building, serving floors, grouping, size, shape of passenger car, door arrangement etc., Service requirements: Quality of service, quantity of service, time, passenger handling capacity, space and physical requirements, machine room spaces and its typical layout Escalators – Definition, Application. Location and arrangement in buildings. Space requirement, Conveyor belts-movement of passengers and goods

UNIT-5 ELECTRICAL AND AC DUCT LAYOUT OF SIMPLE BUILDINGS

Fixtures and accessories used in electrical installation –Preparing an electrical layout for part of design project, with simple load calculations. Design consideration for AC plant location and size. Ac ducting layout for an office building, shopping complex etc.

COs & LOs for BUILDING SERVICES-II

Overall Course Outcome: The overall aim of the course is to introduce students to the various electrical and mechanical systems in building of various scales and also to make them understand electric layouts, fixtures and their sustainable applications in buildings.

CO1	To understand the basics of electric supply in buildings, guidelines for electric installations and safety measures	LO1	**Understand** the principles of electricity, installation and safety in electricity supply
		LO2	**Observe** the methods of electricity supply in metropolitan areas, methods of wiring and earthing etc
		LO3	**Analyse** the guidelines for electric installations in various buildings
		LO4	**Survey** on electric materials and appliances.
CO2	To learn the application of lighting design principles in design and evaluate lighting requirements using light metrics	LO1	**Understand** the principles of lighting design, classification and systems of lighting in buildings.
		LO2	**Observe** the lighting design requirements for various buildings based on function, occupants and usage.
		LO3	**Analyse** the psychology of lighting design and concepts based on efficiency, ergonomics and aesthetics
		LO4	**Survey** on electric materials and appliances.
		LO5	**Evaluate** lighting requirement based on light metrics and calculations
CO3	To evaluate the HVAC systems in buildings, their principles and methods of air conditioning	LO1	**Define** the principles of air conditioning in buildings, types and methods of air conditioning.
		LO2	**Analyse** air conditioning requirements in different types of enclosed spaces, load calculation and
		LO3	**Identify** various systems of air conditioning in buildings and their sustainable application
		LO4	**Evaluate** the effects of air conditioning such as sick building syndrome and pollutants.
CO4	To understand the functioning of various mechanical systems and their installation in buildings	LO1	**Understand** the working of various mechanical systems in building, its classification, design considerations
		LO2	**Analyse** the environmental considerations and service requirements in installation of mechanical devices.
		LO3	**Evaluate** the space requirements, location and arrangement of mechanical devices in buildings
CO5	To prepare electric layouts and HVAC	LO1	**Evaluate** the air conditioning layout of any existing building
		LO2	**Evaluate** the electrical layout of any existing building
		LO3	**Prepare** the electric layout for buildings of various scales

	layouts for large buildings	LO4	**Prepare** the air conditioning layout for large buildings
		LO5	**Calculate** the power load and cooling load for various buildings

REFERENCES:

1. Heating, Cooling, Lighting: Sustainable Design Methods for Architects Oct 13, 2014 by NorbertLechner DEWALT Plumbing Code Reference: Based on the 2015 International Plumbing and Residential Codes (DEWALT Series)

2. Electrical Wiring Residential Jan 1, 2011by Ray C. Mullin and Phil Simmons

3. Architectural Lighting: Designing with Light and Space (Architecture Briefs),May 4, 2011 by Hervé Descottes and Cecilia Ramos.

4. HVAC Design Sourcebook Oct 26, 2011, by W. Larsen Angel

4. Building Sciences & Energy Conservation (Code – 210517)

Objectives –

The course aims to obtain knowledge of building sciences such as design methodology, resource optimization and innovative approaches to eco-design, the acclaimed sustainable buildings designed within the past decade, energy conservation through building design, designing an eco-building.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210517**	Building Sciences & Energy Conservation	BSAE-1	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 CLIMATE &THERMAL COMFORT

Global climatic factors, elements of climate, classification & characteristics of tropical climates, site climate and Urban climate - Thermal balance of the human body, Thermal comfort indices – Effective temperature, CET, calculation of comfort zone & determination of overheated& under heated periods.

UNIT-2 SOLAR GEOMETRY &DESIGN OF SUNSHADING DEVICES

Apparent movement of the sun, sun path diagrams (solar chart) - Solar angles, Shadow angles, solar shading masks. etc - Exercises on plotting isopleths, transfer of isopleths to solar chart, fitting a shading mask over the overheated period & design of sun shading devices for different orientations.

UNIT-3 PRINCIPLES OF THERMAL DESIGN IN BUILDINGS

Thermal quantities – heat flow rate, conductivity (k–value)& resistivity, conductance through a multilayered body, surface conductance, transmittance – U value of different materials – convection , radiation , concept of sol-air temperature & solar gain factor - heat loss & heat gain .Periodic heat flow in building – time lag & decrement factor & its application in selection of appropriate materials for walls & roof. Effect of Insulation & cavity on time-lag.

UNIT-4 VENTILATION & DAY LIGHTING

Functions of ventilation – stack effect due to the thermal forces, wind velocity – wind rose diagram, wind pressure - Air movement through building & around buildings – factors affecting indoor air flow, wind shadow etc. - The nature of light , its transmission , reflection – colored light, the Munsell system

Photometric quantities – illumination, day lighting prediction – the daylight design graph.

UNIT-5 DESIGN FOR CLIMATIC TYPES

Building design & layout planning consideration for warm humid, hot dry, composite & tropical upland climates, climatic data sets – analysis – climate graph – the Mahoney tables & its recommended specification - Exercises on design of small Buildings for various climates.

COs & LOs for Building Sciences & Energy Conservation (210504)			
Overall Course Outcome: The basic objective of this course is to make students learn about human thermal comfort along with required construction techniques and designing strategies to achieve it. It would deal with the study of climate and its relation with the built environment.			
CO1	**Label** various climatic factors affecting human body	LO1	**Define** global climatic factors and elements
		LO2	**Classify** various climatic parameters on micro and macro level of site (tropical climates, site climates and urban climate)
		LO3	**Examine** thermal comfort indices for thermal balance in human body
		LO4	**Identify** overheated and under heated periods
CO2	**Evaluate** characteristics of building openings according to its orientation	LO1	**Relate** sun path and its dynamics to site planning and building designing
		LO2	**Illustrate** winter & summer solar angles per day for designing proper shading devices
		LO3	**Experiment with** heliodon device used to simulate the sun and shadow patterns that occur at various locations and times across the surface of the earth
		LO4	**Analyze** various aspects of solar geometry in building orientation
CO3	**Assess** various building materials in order to achieve thermal comfort inside a building	LO1	**Define** thermal quantities
		LO2	**Outline** U values of different building materials to identify their extent of thermal insulation
		LO3	**Make use** of dry bulb and wet bulb thermometers, rain gauge, etc.
		LO4	**Determine** appropriate materials for walls & roof according to periodic heat flow in building
CO4	**Influence** the integration natural elements as part of built environment	LO1	**Illustrate** stack effect for passive air movement throughout a building
		LO2	**Analyze** natural light transmission, day lighting penetration inside a building
		LO3	**Make use** of anemometers to identify wind direction and speed during site analysis
		LO4	**Test** stack effect and natural light transmission on any of the student's design problem
CO5	**Adapt** climate specific building design strategies in one of the student's design problem	LO1	**Know** all climatic zones exists and their climate data sets
		LO2	**Categorize** various building design & layout planning for different climatic conditions
		LO3	**Adapt** building design strategies of different climatic zones in one of the student's design

REFERENCES:

1. O.H. Koenigsberger, Manual of Tropical housing and building – Climatic Design, Orient Longman, Chennai, 1975.
2. M .Evans – Housing, Climate &Comfort , Architectural Press, London ,1980.
3. E.Schild &M. Finbow – Environmental Physics in construction & its application in Architectural Design Granadar , London, 1981.
4. B.Givoni - Man, Climate & Architecture, Applied Science, Essex 1982.
5. Donald Watson & Kenneth labs – Climatic Design – Mcgraw hill NewYork 1983.
6. A.Konya- Design Primer for Hot Climates, Architectural Press, London, 1980.

5.ELECTIVE- II

a. ARCHITECTURAL PHOTOGRAPHY & JOURNALISM (210521)

Objectives –
To provide the skills relevant to the practice of professional journalism, and to introduce students to· the fundamentals of writing, explaining various strategies and their criticism.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210521**	Architectural Photography & Journalism	DE-2	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT -1 INTRODUCTION TO ARCHITECTURAL PHOTOGRAPHY
General introduction to the art of photography; concept of color; concepts of lighting, distance, visual angle, frames; media. Technical definitions, types of lighting fixtures, types of flashes, controlling lighting levels with flash photography.Color rendering in photographic medium, color rendering in photographs under different lighting condition, lighting colors and its effect on a photograph, color filters in a camera. Exercise in lighting photography with artificial light and black and white photos.

UNIT-2 PHOTOGRAPHIC TECHNIQUES AND COMPOSITION
Equipment: cameras and lenses – techniques: film speed, exposure measurement, gray scale– photofinishing and editing digital images. Perspectives: Single Point, Two- Point, Three- Point and methods of correcting distortions – Lighting: External and Interior

UNIT-3 JOURNALISM
Introduction to journalism, key concepts and objectives of Journalism – Specialized journalism: with emphasis on architectural journalism - Journalism skills: research, reporting, writing, editing, criticism.

UNIT- 4 DISCUSSIONS AND ISSUES
Regional, National and International discussion forums, Changes in contemporary and historical design practices. Discussions on topics needed in an architectural journal and current issues - types of journals, works of key architectural journalists, Public Discourse on the Internet, Mass Media and Public Opinion – critique on selected pieces of journalism.

UNIT-5 FIELD PROGRAM

Exercise on integrating photography in architectural journalism.

COs & LOs for Building Sciences & Energy Conservation (210504)			
Overall Course Outcome: The basic objective of this course is to make students learn about human thermal comfort along with required construction techniques and designing strategies to achieve it. It would deal with the study of climate and its relation with the built environment.			
CO1	**Label** various climatic factors affecting human body	LO1	**Define** global climatic factors and elements
		LO2	**Classify** various climatic parameters on micro and macro level of site (tropical climates, site climates and urban climate)
		LO3	**Examine** thermal comfort indices for thermal balance in human body
		LO4	**Identify** overheated and under heated periods
CO2	**Evaluate** characteristics of building openings according to its orientation	LO1	**Relate** sun path and its dynamics to site planning and building designing
		LO2	**Illustrate** winter & summer solar angles per day for designing proper shading devices
		LO3	**Experiment with** heliodon device used to simulate the sun and shadow patterns that occur at various locations and times across the surface of the earth
		LO4	**Analyze** various aspects of solar geometry in building orientation
CO3	**Assess** various building materials in order to achieve thermal comfort inside a building	LO1	**Define** thermal quantities
		LO2	**Outline** U values of different building materials to identify their extent of thermal insulation
		LO3	**Make use** of dry bulb and wet bulb thermometers, rain gauge, etc.
		LO4	**Determine** appropriate materials for walls & roof according to periodic heat flow in building
CO4	**Influence** the integration natural elements as part of built environment	LO1	**Illustrate** stack effect for passive air movement throughout a building
		LO2	**Analyze** natural light transmission, day lighting penetration inside a building
		LO3	**Make use** of anemometers to identify wind direction and speed during site analysis
		LO4	**Test** stack effect and natural light transmission on any of the student's design problem
CO5	**Adapt** climate specific building design strategies in one of the student's design problem	LO1	**Know** all climatic zones exists and their climate data sets
		LO2	**Categorize** various building design & layout planning for different climatic conditions
		LO3	**Adapt** building design strategies of different climatic zones in one of the student's design

REFERENCES:

1. Julian Calder and john Garrett, The 35mm Photographer's Handbook, Pan Books, London 1999
2. Julie Adair King, Digital Photography for Dummies, COMDEX, New Delhi 1998
3. Professional photography –photographing buildings, David Wilson, Rotovision
4. Point view- The art of architectural photography , E.Manny A Ballan, VNR
5. Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005. 6. Ward, S. J. A. "Philosophical Foundations of Global Journalism Ethics." Journal of Mass Media Ethics., Vol. 20, No. 1, 3-21, 2005

b. VERNACULAR ARCHITECTURE (210522)

Objectives -

Introduce traditions of building structures for habitation, made without the intervention of professional architects. Anticipated Learning

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210522**	Vernacular Architecture	DE-2	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

Unit 1: Introduction to the field of Vernacular Architecture Defining and differentiating vernacular architecture from contemporary architecture, Scope of Vernacular Architecture in Indian Context , Factors Influencing Vernacular Architecture, Building Material and Construction Techniques in Indian Vernacular Architecture, Vernacular Architecture in 21st Century

Unit2: Vernacular Architecture of Rajasthan Local Community rural Houses and havelis from Rajasthan, Shekhawati Haveli of Rajasthan, Construction techniques and materials of the region.

UNIT 3: Vernacular Architecture of Gujarat, Sociology and Planning, Woodwork Details of Gujarat, and Construction techniques and materials of the region.

UNIT 4: Vernacular Architecture of East and North their settlement pattern and Construction techniques and materials of the region.

UNIT 5: Vernacular Architecture of the South Regional topography, local climate, variation in settlement pattern and architecture in different parts of the region and construction techniques and materials of the region.

COs & LOs for Building Sciences & Energy Conservation (210504)			
Overall Course Outcome: The basic objective of this course is to make students learn about human thermal comfort along with required construction techniques and designing strategies to achieve it. It would deal with the study of climate and its relation with the built environment.			
CO1		LO1	**Define** global climatic factors and elements

	Label various climatic factors affecting human body	LO2	**Classify** various climatic parameters on micro and macro level of site (tropical climates, site climates and urban climate)
		LO3	**Examine** thermal comfort indices for thermal balance in human body
		LO4	**Identify** overheated and under heated periods
CO2	**Evaluate** characteristics of building openings according to its orientation	LO1	**Relate** sun path and its dynamics to site planning and building designing
		LO2	**Illustrate** winter & summer solar angles per day for designing proper shading devices
		LO3	**Experiment with** heliodon device used to simulate the sun and shadow patterns that occur at various locations and times across the surface of the earth
		LO4	**Analyze** various aspects of solar geometry in building orientation
CO3	**Assess** various building materials in order to achieve thermal comfort inside a building	LO1	**Define** thermal quantities
		LO2	**Outline** U values of different building materials to identify their extent of thermal insulation
		LO3	**Make use** of dry bulb and wet bulb thermometers, rain gauge, etc.
		LO4	**Determine** appropriate materials for walls & roof according to periodic heat flow in building
CO4	**Influence** the integration natural elements as part of built environment	LO1	**Illustrate** stack effect for passive air movement throughout a building
		LO2	**Analyze** natural light transmission, day lighting penetration inside a building
		LO3	**Make use** of anemometers to identify wind direction and speed during site analysis
		LO4	**Test** stack effect and natural light transmission on any of the student's design problem
CO5	**Adapt** climate specific building design strategies in one of the student's design problem	LO1	**Know** all climatic zones exists and their climate data sets
		LO2	**Categorize** various building design & layout planning for different climatic conditions
		LO3	**Adapt** building design strategies of different climatic zones in one of the student's design

REFERENCES:

1. Dawson Bary, Cooper Ilay : Traditional Buildings of India,1998
2. Michell, G., Penguin Guide to the Monuments of India, Vol I, Viking, London 1989.
3. Tadgell, The History of Indian Architecture, Design and Technology Press, London 1990.
4. Paul Oliver, Encyclopedia of Vermacular Architecture of the World, Cambridge University Press, 1997.
5. V.S. Praman, Havali – Wooden Houses & Mansions of Gujarat, Mapin Publishing Pvt. Ltd., Ahmedabad, 1989.
6. Kullrishan Jain & Minakshi Jain – Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad, 1992.
7. G.H.R. Tillotsum ;The tradition of Indian Architecture Continuity, Controversy – Change since 1850, Oxford University Press, Delhi, 1989.
8. Richardson,Vickey; New Vernacular Architecture: Laurance King Publishing,2001

c. BASICS OF WEB DEVELOPMENT (210523)

Objectives -

Gaining foundational knowledge in web development, HTML, CSS, and JavaScript to enhance digital design skills and employability in architectural firms with a focus on online platforms and interactive web-based projects.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	**210523**	Basics of Web Development	DE-2	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

Unit 1: Introduction to Web Development

- Understanding the basics of websites and the internet
- Exploring the role of HTML and CSS in web development
- Creating a simple webpage using HTML and CSS

Unit2: Introduction to JavaScript

- Introduction to JavaScript and its role in web development
- Basic JavaScript syntax and variables
- Adding interactivity to webpages using JavaScript

UNIT 3: Responsive Web Design

- Understanding the concept of responsive web design
- Creating responsive layouts using CSS media queries
- Implementing responsive design principles in web development

UNIT 4: Introduction to Front-End Frameworks

- Overview of popular front-end frameworks (e.g., Bootstrap, Foundation)
- Utilizing pre-built components and grid systems in web development
- Creating responsive and visually appealing websites using front-end frameworks

UNIT 5: Introduction to Web Hosting and Deployment

- Understanding web hosting and domain registration
- Deploying a website to a web server
- Testing and optimizing the performance of a website

COs & LOs for Building Sciences & Energy Conservation (210504)

Overall Course Outcome: The basic objective of this course is to make students learn about human thermal comfort along with required construction techniques and designing strategies to achieve it. It would deal with the study of climate and its relation with the built environment.

CO1	Compare different web development frameworks and their advantages.	LO1	Recall the key steps involved in the web development process.
		LO2	Explain the roles and functions of web browsers in rendering web pages.
		LO3	Organize and manage files and project structure for effective web development.
		LO4	Compare different web development frameworks and their advantages.
CO2	Construct hyperlinks, images, and multimedia elements within HTML documents.	LO1	Recognize and apply HTML tags, elements, and attributes to structure web content.
		LO2	Construct hyperlinks, images, and multimedia elements within HTML documents.
CO3	Apply color, backgrounds, and typography to enhance web design.	LO1	Implement CSS syntax and selectors to style HTML elements.
		LO2	Apply color, backgrounds, and typography to enhance web design.
CO4	Modify the Document Object Model (DOM)	LO1	Utilize JavaScript syntax and variables to create interactive web elements.
		LO2	Modify the Document Object Model (DOM) using JavaScript functions and events.

	using JavaScript functions and events.		
CO5	Deploy a website to a web server and optimize its performance for efficient web publishing.	LO1	Develop responsive web designs that adapt to different devices and screen sizes.
		LO2	Deploy a website to a web server and optimize its performance for efficient web publishing.

REFERENCES:

1. "HTML and CSS: Design and Build Websites" by Jon Duckett
2. "JavaScript and JQuery: Interactive Front-End Web Development" by Jon Duckett
3. "Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins
4. "Web Development and Design Foundations with HTML5" by Terry Felke-Morris
5. "Eloquent JavaScript: A Modern Introduction to Programming" by Marijn Haverbeke
6. "Responsive Web Design with HTML5 and CSS3" by Ben Frain
7. "Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5" by Robin Nixon
8. "CSS Secrets: Better Solutions to Everyday Web Design Problems" by Lea Verou
9. "Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics" by Jennifer Niederst Robbins
10. "The Principles of Beautiful Web Design" by Jason Beaird

6. Self-study, Seminar (SWAYAM/NPTEL & MOOC) (Code – 210518)

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	-	Self study, Seminar (SWAYAM/NPTEL & MOOC)	SEC-6	-	-	-	-	-	100		100	4	-	-	4	**2**	SO	Offline

Note: Any one of the course available on SWAYAM shall be opted and shall not be repeated throughout the course (B.Arch.)

7. Novel engaging courses

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	-	Novel engaging courses	CLC	-	-	-	-	-	50		50	2	-	-	2	**1**	SO	Interactive

8. Summer Internship Project- II (Code – 210519)

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	210519	Summer Internship Project- II	SEC-7	-	-	-	-	50	-	-	50	2	-	-	2	**1**	SO	Offline

Seminar / Workshop/ Training during previous Summer break will be evaluated

9. Disaster management – 100005

OBJECTIVE -The objective of the subject is to introduce the students about reduce or avoid the potential losses from hazards, assure prompt and appropriate assistance to the victims of a disaster, and achieve a rapid and effective recovery.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	1000005	Disaster management	MAC-3	50	10	20	20	-	-	-	100	2	2	-	-	**Grade**	SO	Online

UNIT- 1 NATURAL HAZARDS AND DISASTER MANAGEMENT

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, Disaster management and Disaster Management cycle Understanding the Causes and effects of natural calamities - floods, tropical cyclones, landslides, heat waves & Tsunami. Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national),Non-Government and Inter-Governmental Agencies

UNIT- 2 ELEMENTARY SEISMOLOGY, EARTHQUAKE EFFECT AND SEISMIC DESIGN PRINCIPLES

Major Historic Earthquakes in the World, earthquake hazard map of India, Causes of Earthquakes: Elastic Rebound theory, Continental Drift and Plate Tectonics, Types of Plate Boundaries, types Of faults, seismic waves – classification of body waves and surface waves, magnitude, intensity, epicenter and energy release, Introduction to Seismic zones, Need for Seismic Zonation, Types of Zonation and Seismic Zonation scales

Earthquake Effects:- On ground, soil rupture, liquefaction and landslides, Behaviors of various types of buildings, lifelines and collapse patterns, Behavior of Non Structural Elements like services, fixtures, mountings etc., Social & Economic Consequences of earthquakes

Concept of seismic design, stiffness, strength, period, ductility, damping, hysteric energy dissipation, center of mass, center of rigidity, torsion, design eccentricities, Seismic effects related to building configuration. Plan & vertical irregularities, Ductility based design: Design of energy absorbing devices, Seismic base isolation and seismic active control.

UNIT- 3 EARTHQUAKE RESISTANT CONSTRUCTION DETAILS AND DESIGN GUIDELINES

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.

Design guidelines for disaster resistant construction at appropriate situations - Engineering, architectural, landscape & planning solutions for floods, tropical cyclones & Tsunami

UNIT- 4 REHABILITATION AND RECONSTRUCTION

Concept of Rehabilitation and Reconstruction, Types of Rehabilitation, Architecture at Risk, Guiding Principles of Rehabilitation and Reconstruction, Different Case Examples of Post Disaster Recovery in and Around India. Problem Areas in Disaster Recovery, Inter-linkages between Recovery and Development.

UNIT- 5 FIRE SAFETY, RESISTANCE & HAZARD MANAGEMENT IN BUILDINGS

Fire, Causes of Fire and Spread of Fire, Fire Fighting, Protection and Fire Resistance, Equipments and Methods of Fighting Fire, Code of Fire Safety, Fire Regulations, Combustibility of Materials. Structural material and Fire Resistance, Planning and Design of Fire Escape Routes and Elements, Wet Risers, Sprinklers, Smoke Detectors, Fire Dampers, Fire Doors & Water Curtains etc.

COs & LOs for Disaster management (100007)

Overall Course Outcome: The basic objective of this course is to introduce the students about reducing and avoiding the potential losses from hazards, assure prompt and appropriate assistance to the victims of a disaster, and achieve a rapid and effective recovery.

CO1	**Define** disaster management and its implementation	LO1	**Define** hazard, disaster, vulnerability and capacity building
		LO2	**Classify** causes and effects of natural calamities
		LO3	**Examine** the disaster management processes
		LO4	**Identify** the role of various institutions in disaster management
CO2	**Summaries** the cause of the earthquake and various seismic zones.	LO1	**List** major Historic Earthquakes in the World
		LO2	**Illustrate** the cause of earthquake and basic terminologies
		LO3	**Analyse** the concepts of response spectrum
		LO4	**Determine** the use of different Seismological Instruments
CO3	**Identify** physical aspect affecting design principles	LO1	**Recall** the physical effects of Earthquake
		LO2	**Outline** the behavior of Non Structural Elements and Social & Economic Consequences of earthquakes

	at different seismic locations	LO3	**Illustrate** building configuration based on seismic characteristics of the sites
		LO4	**Perceive** seismic design principles
CO4	**Perceive** different construction techniques to make structure earthquake resistant	LO1	**Recall** building elements where seismic risk reduction intervention could be done
		LO2	**Summarize** the construction details and various types of building elements specific to earthquake resistance
		LO3	**Appraise** local and traditional earthquake response practices
CO5	**Conclude** existing design guidelines as solution to adverse impact of disasters	LO1	**Infer** case studies of disaster management - earthquake, cyclone, landslides, floods, tsunamis, droughts, etc
		LO2	**Categorize** design guidelines for disaster resistant construction at appropriate situations

REFERENCES:

1. Agarwal Pankaj, Shrikhande Manish , Earthquake Resistant Design Of Structures, Prentice-Hall of India, New Delhi, 2006
2. S. K. Duggal, Earthquake Resistant Design Of Structures, Oxford University Press, 2007
3. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management
4. Guidelines For Reconstruction Of Houses Affected By Tsunami, UNDP India, & Government Of Tamil Nadu, 2004
5. Manual on natural disaster management in India, M C Gupta, NIDM, New Delhi
6. Disaster Management Act 2005, Publisher by Govt. of India
7. SERC Guidelines for Design and Construction of buildings and structures in cyclone-prone areas, SERC, CSIR, Government of India, 1998,
8. IS 1893(Part 1):2002 'Criteria for Earthquake Resistant Design of Structures: Part 1 General provisions and Buildings'
9. Ramachandran G. , Charter D. (2011) Fire Safety and Risk Management, SPON Press, NewYork.
10. Martin Muckett, Andrew Furness (2007) Introduction to Fire Safety Management, Taylor & Francis. NewYork.
11. Bureau of Indian Standerd (2005)
12. National Building Code (2016)
13. Taranath B.S. (2004). Wind and Earthquake Resistant Buildings: Structural Analysis and Design. CRC Press.
14. World Bank (2009). Handbook for Reconstructing after Natural Disasters.

THIRD YEAR SIXTH SEMESTER

Architectural Design – VI (Code – 210601) Objectives –

The course aims to obtain knowledge of Architecture as a design response to Technology, hospitality industry in the first project & requires the student, large scale building with Innovation & experimentations.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	210612	Architectural Design VI	DC- 13	100	20	20	20	50	30	10	250	7	2	3	2*(1.5)	**8**	AO	Offline**

PROJECT I: DESIGN FOR HOSPITALITY INDUSTRY

The project requires the understanding of the special nature and functioning of the hotel industry and to respond with suitable concepts of space planning, circulation, interior design, materials and lighting. Example: Hotels- Business, resort, heritage, boutique etc. The

student needs to concentrate on site planning, space planning, circulation, services and the various aspects of interior design such as furniture, flooring, ceiling, lighting etc. Students get exposure to the difference between a business hotel & a resort as well as the special needs of heritage and Boutique hotels. Exercises in interior space visualization using computer software is attempted.

PROJECT II: URBAN INFRASTRUCTURE PROJECTS

Contemporary transportation terminals and stadiums are large buildings with multiple entries & exits dealing with large crowds and having multiple levels with large spans, complex services & demanding environmental conditions. Function, convenience and security will become the basic design parameters. Example - Bus terminal / Railway station / Indoor sports complex / Aquatic complex etc. This studio challenges the designer to come up with a feasible structural solution after undertaking a study of large span structural systems. Moreover planning for transport terminals requires understanding of safety norms & to design sport facilities understanding of optimum environmental parameters is the requisite.

COs & LOs for Architectural Design – VI (210601)

Overall Course Outcome: The course aims to obtain knowledge of Architecture as a design response to Technology, hospitality industry in the first project & requires the student, large scale building with Innovation & experimentations.

CO 1, 2, 3, 4, 5	The course should enable the student to: • Train the student to gather knowledge on the given design project based on books / literature and websites. • Make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings. • Develop design ideas and create them.	LO1	Summarize basic concept of spatial planning of different types of buildings such as Hospitality and Infrastructure projects
		LO2	Apply large span structural systems in design
		LO3	Apply building bye laws in building design.
		LO4	Apply various essential services in complex buildings.
		LO5	Analyze the project with respect to various environmental parameters.
		LO6	Design Hospitality and Infrastructure projects

REFERENCES:

1. Time saver standards for building types, De Chiara and Callender, McGraw hill company
2. Neufert Architect's data, Bousmaha Baiche& Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. New Metric Handbook – Patricia Tutt and David Adler – The Architectural Press

Note: One design problem shall be given in End Semester Examination. 6X3 hours examination.

2. Building Services-III (Acoustic & Fire Fighting) (Code – 210602)

Objectives –

The course aims to obtain knowledge of the basic principles of acoustics in buildings and their integration with architectural design, suitable materials in the design of auditoria and the method to achieve noise control in built spaces, firefighting services and design alteration for it, Layout of firefighting integrated system in building design.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	210613	Building Services III (Acoustic & Fire Fighting)	BSAE-14	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended*** (2/2)

UNIT-1 INTRODUCTION TO THE STUDY OF ACOUSTICS & SOUND TRANSMISSION, ABSORPTION, INSULATION

Acoustics-Definition, terms related to acoustics. Theory of sound: generation, propagation, transmission, reception of sound, sound waves, frequency, intensity wavelength, sound pressure, measurement of sound scales-decibel scale. Calculation of reverberation time using Sabine's formula, Recommended RT/Volume for different spaces. Acoustical defects-echoes, focusing of sound, dead spots, flutter echo. Room resonances, small enclosures, standing waves, proportioning of room dimensions. Room acoustic phenomena: Reflection (plane, concave and convex surfaces), diffusion, reverberation, absorption. Acoustical requirements of different types of building, sound absorption, absorption co-efficient and their measurements, Sound insulation, materials, STC ratings, sound isolation. Sound absorptive materials and their choices, absorption coefficients and their measurements, NRC value.

UNIT-2 NOISE CONTROL AND SOUND REINFORCEMENT & ACOUSTICS IN BUILDING DESIGN AND CONSTRUCTION

Sources and types of noise, characteristics and effect of noise impact on human beings/behavior, noise curves, transmission of noise – airborne and structure borne, transmission loss, Means of noise control- source (enclosures), path (Barriers and insulations) and receiver (personal controls).Measure of noise control for different constructions – construction details of cavity walls, composite walls, floating floor, wood-joist floors, plenum barriers.

Design: Site selection, shape, volume, treatment for interior surface, basic principles in designing open air theatres, cinemas, broadcasting studios, concert halls, class rooms, lecture halls, theatres – Auditorium.

Construction: Constructional detailing, relation to walls/ partition, floor / ceiling/ opening/ windows/ doors. Acoustical requirement of different types of buildings.

UNIT-3 FIRE FIGHTING SERVICES

Fire extinction / suppression technology: constituents of fire, methods of fire extinguishment, Extinguishing agents / media Fire suppression equipment & installations (active fire protection measures) : fire detection and alarm systems (automatic fire alarm systems), Heat Detectors, Smoke detectors, flame detectors, Choice / Selection of Fire Detectors

Hydrant systems / installations- stand post and Underground type of hydrants (Sluice Valve Type). Internal Hydrant Systems - Dry-riser system, Wet-riser system, Wet-riser-cum -down-comer system and Down-comer-system. Sprinkler system types. Early Suppression Fast Response Sprinklers (ESFR), water spray systems, automatic drencher systems.

UNIT-4 FIRE FIGHTING SYSTEMS & BUILDING NORMS

Extinguishing Systems - Foam, CO2 and Halon Fire System, first aid firefighting equipment: portable fire extinguishers and its types, graphic symbols for fire protection plans, fire protection - safety signs. Building fire hazards: Relationship of Building Fire Hazards with Life Safety, Hazards from Building Contents, Fire Load and Fire Effects, Exposure Hazard, Hazards from Interior Finish and services. Hazards in Buildings from Collapse, Explosion. Life hazards in buildings and means of escape / egress / exit : Factors affecting Life Safety of Occupants, Growth and Spread of Fire and Smoke, Design Considerations of Means of Exit, Exit Requirements, Lifts and Escalators as Means of Exit, Occupant load, capacities of exits, internal staircases, fire lifts, Firefighting Shafts, external stairs, horizontal exit, illumination of exits ,fire compartmentation, fire tower, refuge areas and ramps.

UNIT-5 FIRE FIGHTING LAYOUT OF BUILDINGS & DESIGN AND DETAILING FOR ACOUSTICS OF MULTIPURPOSE HALLS

Analyze a Fire fighting layout for a commercial building, Reflected ceiling plan of smoke detectors / sprinklers, etc. for a multistoried building.
Discuss and analyses fire accident case studies.

Case studies of acoustically designed and treated multipurpose halls. Onsite measurement with Sound measurement equipment's. Design of a multipurpose hall for optimum acoustics - drawings and construction details of acoustical treatment on walls, ceilings and floors.

COs & LOs for BUILDING SERVICES-III			
Overall Course Outcome: The overall aim of the course is to introduce students to acoustical treatments in building and also to make them understand the significance of fire safety in buildings and its standard norms.			
CO1	To understand the principles of sound and acoustical requirements of various buildings	LO1	**Understand** the theory of sound transmission in enclosed spaces
		LO2	**Observe** the properties of sound in enclosed space and phenomena of room acoustics
		LO3	**Calculate** the reverberation time using Sabine's formula and acoustical requirements
		LO4	**Survey** on acoustical materials and techniques
CO2	To analyse the methods of sound reinforcement and noise control methods in enclosed space	LO1	**Define** the principles of sound reinforcement and Noise, sources and types.
		LO2	**Understand** the behaviour of noise and means of noise control
		LO3	**Analyse** measures of noise control
		LO4	**Evaluate** design requirements for noise control and sound reinforcement in various enclosed spaces (theatres, lecture hall. Studio etc.)
		LO5	**Develop** construction details for acoustical treatment in enclosed spaces.
CO3	To learn the application of firefighting equipments in buildings	LO1	**Understand** the significance of firefighting services in building,
		LO2	**Analyse** the working and installation of firefighting equipment in buildings
		LO3	**Analyse** the application fire hydrant systems in buildings
		LO4	**Evaluate** the installation of sprinkler systems through examples from existing building applications.
CO4	To determine the significance of norms and standards in firefighting systems and its application	LO1	**Learn** the standards and norms for firefighting services
		LO2	**Understand** the relationship between fire hazard and life safety in buildings
		LO3	**Analyse** the application of these norms through existing case examples
		LO4	**Evaluate** the space requirements, location and arrangement of firefighting equipment in building.
CO5	To apply the principles of acoustics and firefighting systems in various building by developing construction details and layouts for the same	LO1	**Evaluate** the construction details for acoustical treatment of any existing building
		LO2	**Evaluate** design of an auditorium/theatre/studio etc for acoustical treatment through existing building examples
		LO3	**Design** a multipurpose hall for optimum acoustics
		LO4	**Evaluate** the application of firefighting services in existing buildings
		LO5	**Design** a layout for firefighting services for commercial/institutional buildings

REFERENCES:

1. Architectural Acoustics- David Egan, J. Ross Publishing Classics
2. Acoustical Designing in Architecture- Vern.O Knudsen and Cyril M. Harris, Wiley Publisher
3. Acoustics, noise and buildings- Peter.H. Parkins and H.R. Humphreys, Pitman *publishing* corporation, New York, Chicago
4. Master Handbook of Acoustics–F. Alton Everest and Ken.C. Pohlmann Paper back *Publisher*

3. Site Planning &Landscaping (Code – 210608)

Objectives –

The course aims to obtain understanding of environment, human interventions and its impacts on nature and knowledge about various measures of protecting it, various concepts, ideas and techniques prevalent in landscape architecture, concepts of site planning and effective measures of doing it, the historic development of landscaping and site planning to students.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	210614	Site Planning and Landscaping Architecture	DC- 14	50	10	20	20	-	-		100	3	2	1	-	**3**	PP	Blended* (2/1)

UNIT-1 INTRODUCTION & ELEMENTS OF LANDSCAPE ARCHITECTURE AND LANDSCAPE DESIGN

Introduction to landscape architecture, ecology, ecological balance, landscape conservation, reclamation and landscaping of derelict lands, environmental impact assessment. Elements of landscape – land elements, land form plants and planting, water, lighting etc. characteristics and classification of plant materials, basic principles of landscape design; Factors to be considered, Use and application of plant materials in landscape design, and other components involved

UNIT-2 HISTORY OF LANDSCAPE ARCHITECTURE & URBAN LANDSCAPE

Development of landscape design: Detailed study of selected examples from Eastern, Central and Western traditions; Ancient Heritage - Mesopotamia, Egypt, Greece, Rome; Western Civilization – Europe: Italy, France, and England; The middle-east - The Persian tradition and its far reaching influence Eastern Civilization: China and Japan Ancient and medieval period in India; Mughal and Rajput Landscapes and study of contemporary landscape architecture.

Basic principles and elements of Urban landscape, Significance of landscape in urban areas, introduction to street furniture, road landscaping, waterfront development, landscaping of residential areas, Industrial Landscaping.

UNIT-3 INTRODUCTION TO SITE ANALYSIS & SITE INFLUENCING FACTORS

Introduction to Site analysis, Importance of site analysis; interrelationship between nature and human interventions , thematic traditions in site design, history of site design as a source for precedent analysis

On site and off site factors; Analysis of natural, cultural and aesthetic factors; topography, hydrology, soils, landforms, vegetation, climate, microclimate. Influence of water bodies

UNIT-4 DESIGN OF LANDFORMS IN A SITE & SITE PLANNING PRINCIPLES AND TECHNIQUES

Contours - representation of landforms and landform design, interpolation of contours, slope analysis, uses and function. Grading - Symbols and grading and alignment of paths/roads, angle of repose and use of retaining walls. Grading terraces. Drainage - surface drainage, functional and aesthetic considerations. Site Zoning. Organization of vehicular and pedestrian circulation; parking; street widths; turning radii; street intersections; steps and ramps. Site planning considerations in relation to water systems, sewage disposal, outdoor electrical systems.

UNIT-5 SITE CHARACTERISTICS AND DESIGN REQUIREMENTS& LANDSCAPE EXERCISE

Landscape design of a neighborhood open space (area of 2000 to 3000 sq. meters)

Exploration of site planning options for residential, commercial, office, industrial and mixed-use projects; street network, civic space, and open space planning; emphasis on walkable, mixed-use, transit-oriented sustainable development

COs & LOs for Site planning & Landscaping Architecture			
Student will be able to apply different methods in landscape practice and incorporate site planning for a specific land use.			
CO1	**Understanding** role and importance of site planning in enhancing quality of building environment	LO1	**Defining** various parameters of site analysis and its importance
		LO2	**Gathering** past information site design, theories
		LO3	**Summarizing** on site and off site factors,
		LO4	**Analysing** different layers of site planning for better design process
		LO5	**Programme** a zoning plan for a given site
CO2	**Learning** about the interrelationship between nature and humans. Role of natural elements in environment	LO1	**Defining** environment terminologies such as ecological balance, eco system, etc.
		LO2	**Extending** the role of environment in construction
		LO3	**Summarizing** elements and principles of landscape
		LO4	**Applying** elements and plant material in design process
		LO5	**Categorizing** plant material & understand their benefits
CO3	**Understanding** the construction techniques of hardscape, contours, landforms and its application on site.	LO1	**Expressing** landform through contour lines
		LO2	**Determining** slope percentage
		LO3	**Calculating** various physical characteristics like grading, drainage pattern
		LO4	**Reflecting** knowledge on techniques of retaining walls, steps, ramps
		LO5	**Managing** to propose plan of water systems, electrical, disposal
CO4	**Awareness** about characteristic of various historical gardens and concepts of urban landscape in design	LO1	**Understanding** the design philosophy behind history of landscape
		LO2	**Analysing** characteristics & features garden styles of different eras
		LO3	**Explaining** various design elements of urban landscape
		LO4	**Reflecting** on different usage of landscaping according to site context
		LO5	**Creating** presentation on historical gardens and example of urban landscape
CO5	**Application** of different methods in landscape practice which incorporate site planning for a specific land use	LO1	**Searching** for a land for landscape development
		LO2	**Exploring** the site by site visits and available secondary data
		LO3	**Applying** the various site planning options to given site
		LO4	**Criticizing** and appraising the existing site and design
		LO5	**Proposing** a site plan with landscape features on given land

REFERENCES:

1. T S S for Landscape Architecture, Mc Graw Hill,Inc, 1995 .
2. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company,1993 .
3. Brian Hacket, Planting Design .
4. T.K. Bose and Chowdhury, Tropical Garden Plants in Colour, Horticulture And Allied Publishers,Calcutta, 1991.
5. Motloch, J.L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.., McGraw Hill Book Co., New York, 1981.Sam kubba, " Green construction project management and cost oversight", Elseiver, 2010
6. Kevin Lynch , "Site Planning", MIT Press, 1967
7. Time Savers Standards for Site Planning, McGraw Hill, Inc, 1995
8. Richard Untermann and Robert Small, "Site planning for cluster housing", Van NostrandReinholdCompany, 1977
9. Michael Laurie, "An Introduction to Landscape Architecture", Elsevier, 1986
10. TSS for Landscape Architecture, McGraw Hill, Inc, 1995
11. John Ormsbee Simonds, "Landscape Architecture: A manual of site planning & design", McGra

4 . Working Drawing (Code – 210604) Objectives –

The course aims to obtain understanding of standards and conventions used for preparation of architectural drawings to develop the skills of preparing various architectural drawings and details used for construction of buildings, drawings in sufficient details such that the contractor is able to construct a building as per the design, Graphical presentation of all the components of a building along with dimensioning and annotations, application of IS Codes, Conventions/ methods of preparing a working drawing along with tabulation of schedules of materials, finishes and hardware/ Linking up working drawings / specifications in an architectural project.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	210620	Working Drawing	PAEC-2	-	-	-	-	50	30	20	100	5	1	1	6	**5**	PP	Offline**

UNIT- 1 BUILDING DRAWING

Centre line plan, Foundation plan, Structural grid plan (in case of framed structures), Basement floor plan, Ground floor plan, Typical floor plan, All elevations, All sections: one at least through staircase and one through toilet, Terrace floor plan giving details of surface drawing etc.

UNIT- 2 SERVICES

Sanitation drawings showing fixtures etc, Electrical layout plan, typical wall profiles sections, detailed drawings of special rooms like kitchens, toilets, staircase etc.

UNIT- 3 SPECIFICATION

In addition to the above, students are expected to prepare a detailed clause by chance specifications for at least one of the 3 projects Specifications writing include the following aspects: Materials, Pre and post installation work., Test if any, Mode of measurements, Knowledge of manufacturers specifications as a database for writing specifications for the following materials, based on surveys:

UNIT- 4 MATERIALS

Glass Plywood and laminates Hardware Electrical wires and accessories Water supply and plumbing: fittings and fixtures flooring and cladding.

UNIT- 5 EXERCISE

One working drawing of a previous year architectural design project having load bearing structure with Minimum 150 sq. m. carpet area not exceeding 2 stories. Two details such as doors/windows/railings/kitchen etc.

COs & LOs for Working Drawing **Overall Course Outcome:** Students will be able to develop, draw various architectural drawings and details used for construction of buildings, drawings in sufficient details such that the contractor is able to construct a building as per the design.			
CO1	Student will able to understand the various building drawings.	LO1	**Learn** various building drawing use in working drawing.
		LO2	**Understand** the use of various building drawing.
		LO3	**Apply** various building drawing to own project.
		LO4	**Analyze** the necessity of various building drawing in architectural project.
		LO5	**Draw** various building drawing**.**
CO2	Student will be able to understand and draw various services plan used in architectural project.	LO1	**Study** the various services used in architectural project.
		LO2	**Understand** use of services in architectural project.
		LO3	**Draw** various services plan used in architectural project.
CO3	Student will able to understand and write various specification of material required during execution of a project.	LO1	**Study** the detailed specifications for Materials used Pre and post installation work in architectural project.
		LO2	**Understand** the need of specifications.
		LO3	**Formulate** detailed specifications for any architectural project.
CO4	Students will understand various materials, finishing material used in architectural project.	LO1	**Learn** various building materials used in architectural project.
		LO2	**Understand** use of materials in architectural project.
		LO3	**Analyze** the fitting of materials in project.
CO5	Students will be able to develop working drawing sets for load bearing and a frame structure architectural Design project.	LO1	**Study** about working drawing sets for load bearing and a frame structure architectural Design project.
		LO2	**Understand** use of working drawing sets for architectural project.
		LO3	**Draw** working drawing sets for load bearing and a frame structure architectural Design project.

REFERENCES:

1. Building construction specification – Jack Lerrs
2. Standard specification of state governments
3. Specification in detail –Frank W. Makay
4. Building Drawing – M.G. Shah, CM, Kale, S.Y. Paoui
5. Architectural Working Drawings –Ralph W. Liebing, Mimi Ford.

5 ELECTIVE-III

Objectives –

The course aims to obtain knowledge of fundamental concepts and theories of Housing and apply them in their design projects, various types of Housing and its components, the vocabulary of interior design, interior and furniture design and design movements through history, components of interior space and treatment and finishes for the same, the various components of interior design like lighting, landscaping and furniture.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	210611	Housing (Elective - III)	DE- 1	50	10	20	20	-	-		100	3	1	2	2	**3**	PP	Blended* (2/1)

(i) HOUSING

UNIT- 1 INTRODUCTION TO HOUSING AND HOUSING ISSUES.

Housing demand and need, Role of Government and public agencies in Housing development, National housing policy, comparison of housing policies and programmes of developed and developing country, Housing agencies, housing programmes and resources, Housing finance.

UNIT- 2 SOCIO ECONOMIC ASPECTS.

Social factors influencing Housing Design – identity, safety, convenience, access, amenities etc, economic factors -affordability and its relationship to house income, incremental housing concept, Slum Upgrading and sites and services schemes and reconstruction process.

UNIT- 3 HOUSING STANDARDS.

Different types of housing standards – spatial standards, safety standards, standards for amenities, Methodology of formulating standards, UD PFI – guide lines, standard and regulations – DCR – performance standards for housing, TCPO, New norms and amenities

UNIT- 4 MODERN TECHNIQUES IN HOUSING CONSTRUCTION.

Prefabrication techniques –modular house, panelized and precast homes, sustainable practices – zero energy home, eco housing, green homes - Teri – Griha and its rating system, Recent advancement in materials, Design guidelines, Environmental impact of Building materials, Environmental quality.

UNIT- 5 HOUSING DESIGN AND PROCESS.

Traditional housing, row housing, cluster housing – apartments and high-rise housing, gated community, Government housing – HUDCO financed project for economically weaker section, their Advantages and disadvantages. Methods and approaches to housing design. Various stages and tasks in project development – feasibility study, detailed study.

COs & LOs for Housing (210611)

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories of Housing and apply them in their design projects, various types of Housing and its components, the vocabulary of interior design, interior and furniture design and design movements through history, components of interior space and treatment and finishes for the same, the various components of interior design like lighting, landscaping and furniture.

CO1	**Understand** the housing issues and importance of housing development	LO1	**Relate** housing demand & need with its availability
		LO2	**Interpret** the role of government and public agencies in housing development
		LO3	**Analyse** housing policies and programmes
		LO4	**Define** necessary resources and housing finance
CO2	**Relate** the socio economic aspects of site with its housing characteristics	LO1	**List** social factors influencing Housing Design
		LO2	**Demonstrate** the relationship between affordability and household income
		LO3	**Examine** incremental housing concept
		LO4	**Justify** the need of slum rehabilitation
CO3	**Identify** various housing standards, guidelines, regulations, norms, amenities, etc.	LO1	**Define** different types of housing standards
		LO2	**Outline** the methodology of formulating standards
		LO3	**Illustrate** different housing guidelines, standard and regulations- URDPFI, DCR, TCPO,etc
CO4	**Discover** modern techniques for efficient and sustainable housing	LO1	**Define** modern construction techniques
		LO2	**List** sustainable practices and recent advancement building materials
		LO3	**Appraise** different green rating system specific to housing
		LO4	**Summarise** modern housing construction techniques in context of changing scenario and globalization
CO5	**Categorise** different housing design process as per desired requirements	LO1	**Define** types of housing
		LO2	**Analyse** housing project for economically weaker section
		LO4	**Elaborate** design process, stages, tasks, methods, approaches to different type of housing projects

REFERENCES:

1. Kavita Datta and GA. Jones,' Housing and Finance in Developing Countries',Routledge,London,1999.
2. Housing Design –Eugene Henry Klaber – Reinhold publishing corp.
3. Daniel Vallero and Chris Brasier, Sustainable Design – The science of sustainability and Green Engineering;Wiley;2008
4. Thomas E Glavinich; Green Building Constction; Wiley;2008
5. GeofreyK.Payne, Low Income Housing in the Development World, John Wiley and Sons, Chichester,1984.
6. Martin Evans, Housing, Climate and Comfort, Architectural Press, London, 1980
7. An introduction to Urban Housing Design –Graham Towers.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	210619	Design Thinking in Architecture(Elective - III)	DE- 1	50	10	20	20	-	-		100	3	1	2	2	**3**	PP	Blended* (2/1)

(ii) DESIGN THINKING IN ARCHITECTURE

UNIT-1 Introduction

Introduction to Design thinking, who are clients, what is customer centric approach of Design, Customer Journey mapping, Brainstorming.

UNIT- 2 Perspectives of Design Thinking

Introduction Lenses for Design Thinking, Ecologically Sensitive Design Solutions, Empathetic Design Solutions, Community Solutions, Post COVID Considerations, Learning from Past, Technological Inputs, Universal Design

UNIT- 3 Tools for Design Thinking

Tools for design thinking, solutions of How to conduct a case study, to do survey, to do research in architecture, to frame the brief/problem, to strategize the brief.

UNIT – 4 Design Setups in Architecture

Introduction Setups in Architecture, Collaborations in Architecture, Scales of setups, Innovations in Business Strategies.

UNIT- 5 Communication, Elevator Pitch and Growth

Introduction Communication, Elevator Pitch and Growth, Branding, Building connections, people skills, Elevator Pitches, Use of Social Media and Website.

COs & LOs for Society, Culture And Architecture (210412) **Overall Course Outcome:** The course aims to obtain knowledge about society, culture, environment, etc. in architecture design and site planning.			
CO 1	Students will be able to **relate** sociology with architecture and planning	LO1	**Define** various cultures and civilizations
		LO2	**Explain** fundamentals of society, culture and politics with reference to architectural history
		LO3	**Discover** forms of historical social organization
		LO4	**Identify** relationship of sociology and architecture
CO 2	Students will be able to **inspect** basics of traditional architecture	LO1	**Define** different architectural forms and models
		LO2	**Illustrate** the supremacy of people on their neighboring built environment
		LO3	**Inspect** the influence of asian tradition on its architectural style
		LO4	**Analyze** the concept of traditional architecture
CO 3	Students will be able to **illustrate** the site specific nature of architectural design	LO1	**Recall** architecture and its context
		LO2	**Outline** social and cultural aspects of building practices
		LO3	**Determine** architecture as an powerful agent to bring changes in society and culture
		LO4	**Conclude** architecture as an identity of a place/site
CO 4	Students will be able to **distinguish** cultural change and indigenous architectural practices	LO1	**Illustrate** transformation of architectural form over a period
		LO2	**Analyze** globalization and localization with the help of suitable examples
		LO3	**Interpret** the role of culture and its impact on architectural identify
CO 5	Students will be able to **apply** rejuvenation in architecture	LO1	**Define** basic terms of architectural rejuvenation
		LO2	**Categorize** concept of renewal, transformation, redevelopment, rejuvenation in architectural context

REFERENCES:

Huckerby, Martin., The Net for Journalists: A Practical Guide to the Internet for Journalists in Developing Countries. UNESCO/Thomson Foundation/ Common wealth Broadcasting Association, 2005.

6. ELEXTIVE –IV (Opted from NPTEL)

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted									Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot			MOOC				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation											
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project	Assignment	Exam								
6.	-	ELECTIVE –IV	DE- 4	-	-	-	-	-	-		25	75	100	3	2	1	-	**3**	Offline *	MCQ

S no	Elective	Sub code	Sub Name	Remark
1	ELECTIVE- 4			opted from NPTEL platform

7. Novel Engaging Course

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.		Novel engagin courses	CLC					50			50	2			2	**1**	SO	Interactive

8. Tour/ Seminar / Workshop/ NASA Training during winter break (Code – 210419)

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
8.	210621	Tour/ seminar / Workshop/ Train during winter bre	SEC- 8	-	-	-	-	50	-		8.	2	-	-	2	**1**	SO	Offline

Study Tour/ Seminar / Workshop/ Training during previous winter break will be evaluated

1. INTELLECTUAL PROPERTY RIGHT (Code – 210610)

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
9.	**210610**	**Intellectual Property Rights**	**MAC-4**	50	10	20	20	-	-	-	100	2	2	-		Grade	MCQ	Online

UNIT – I: Introduction

Introduction to IPRs, Basic concepts and need for Intellectual Property – Meaning and practical aspects of Patents, Copyrights, Geographical Indications, IPR in India and Abroad. Nature of Intellectual Property, Industrial Property, technological Research, Inventions and Innovations – Important examples of IPR.

UNIT – II: Intellectual Property Rights

The IPR tool kit, Patents, the patenting process, Patent cooperation treaties: International Treaties and conventions on IPRs, TRIPS Agreement, PCT Agreement, Patent Act of India, Patent Amendment Act, Design Act, Trademark Act, Geographical Indication Act.

UNIT – III: Intellectual Property Protections

IPR of Living Species, protecting inventions in biotechnology, protections of traditional knowledge, biopiracy and documenting traditional knowledge, Digital Innovations and Developments as Knowledge Assets – IP Laws, Cyber Law and Digital Content Protection. Case studies: The basmati rice issue, revocations of turmeric patent, revocation of neem patent.

UNIT – IV: Exercising and Enforcing of Intellectual Property Rights

Rights of an IPR owner, licensing agreements, criteria for patent infringement. Case studies of patent infringement, IPR – a contract, unfair competitions and control, provisions in TRIPs,

UNIT- V: Role of Patents in Product Development & Commercialization

Recent changes in IPR laws impacting patents and copy

COs & LOs for Intellectual property Rights- (Code – 210707)

Overall Course Outcome: Students will be able to **understand** the basic concepts of Intellectual Property Rights and to develop expertise in the learners in IPR related issues and sensitize the learners with emerging issues in IPR and the rationale for the protection of IPR.

CO1	Students will be able to understand the importance of it in architectural services.	LO1	**Remember** basic concepts of Intellectual Property Rights and to develop expertise in the learners in IPR related issues
		LO2	**Learn** the practical aspects of Patents, Copyrights, Geographical Indications in the practice.
		LO3	**Understand** the IPR in India and Abroad. Nature of Intellectual Property, Industrial Property, technological as per norms.
		LO4	**Analyze the** research, inventions and innovations in IPR.
		LO5	**Evaluating** role of an IPR in comprehensive architectural services.
CO2	Students will be able to apply IPR in architectural services.	LO1	**Remember** basic IPR tool kit, Patents, the patenting process, Patent cooperation treaties among the parties.
		LO2	**Learn** the different legislation in IPR.
		LO3	**Understand** the different acts in IPR.
		LO4	**Analyze** the legislation and acts in architectural practices.
		LO5	**Evaluating** role of IPR legislation and acts in architectural services.
CO3	Students will be able to understand inventions in biotechnology, protections of traditional knowledge, biopiracy and documenting traditional knowledge.	LO1	**Remember** the IPR of Living Species, protecting inventions in biotechnology, protections of traditional knowledge.
		LO2	**Understand** bio piracy and documenting traditional knowledge, Digital Innovations.
		LO3	**Learn** various IP Laws, Cyber Law and Digital Content Protection.
		LO4	**Analyze** the case studies in IPR .
		LO5	**Evaluating** the case studies of IPR in architectural services.
CO4	Students will be able to understand the different legislations applicable to architects, in IPR.	LO1	**Remember** the Rights of an IPR owner, licensing agreements.
		LO2	**Understand** the criteria for patent infringement.
		LO3	**Learn** the role of licensing agreements in architectural service.
		LO4	**Analyze** the case studies of patent infringement.
		LO5	**Evaluating** the case studies of patent infringement in architectural services.
CO5	Students will be able to understand the running of an architect's office and applicable laws, rules and regulations, pitching for projects .	LO1	**Remember** basic recent changes in IPR laws impacting patents and copyrights.
		LO2	**Understand** the intellectual cooperation in the science and allied industry.
		LO3	**Learn** patentable and non-patentable research.
		LO4	**Analyze** the case studies of Patents in Product Development & Commercialization
		LO5	**Evaluating** the case studies of Patents in Product Development & Commercialization in architectural services.

FOURTH YEAR VII SEMESTER

1. Architectural Design VII (210711)

OBJECTIVE: The objective of the subject is to Understand design as a function of specific agenda of complex services, acoustics, building byelaws and structure and to understand design as a process: of problem identification, space analysis, formulation of requirements, evolution of design criteria and design, to incorporate elements of site planning and landscape in the design process, to prepare computer aided presentation drawings.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210711**	**Architectural Design VII**	**DC- 15**	-	-		-	100	80	20	200	6	-	-	6*(1.5)	**9**	Offline**	AO

Problem -1

The range of design problems shall include projects of progressively increasing complexity. Exercises related to public buildings i.e. Commercial center, hospital, Study and incorporation of building bye-laws should be complete in this Sem.

Problem -2

The range of design problems shall include projects of progressively increasing complexity.

Exercises related to public buildings i.e. Auditorium, sports cinema, sports complex & educational buildings on sloping/ flat sites. Simultaneously, stress should be given on the interior treatment of small and large spaces. Freedom in design is to be given with preliminary introduction of importance and role of bye laws in building design.

Note: The sessional will be in the form of drawings and models along with technical report for the design dealt with. The evaluation should be done in intermediate review consisting of internal /external experts. There should be regular site visits to the building types dealt in the studio problems of which audio - visual should be prepared. The various aspects of the design problem shall be dealt with lectures, group discussions and library research so as to provide the necessary philosophical and attitudinal background to a rational design approach.

COs & LOs for Architectural Design VII (210711)

<table>
<tr><td colspan="4">Overall Course Outcome: Understand design as a function of specific agenda of complex services, acoustics, building byelaws and structure, understand design as a process: of problem identification, space analysis, formulation of requirements, evolution of design criteria and design, incorporate elements of site planning and landscape in the design process, prepare computer aided presentation drawings.</td></tr>
<tr><td rowspan="5">CO 1, 2, 3, 4, 5</td><td rowspan="5">The course should enable the student to:
Train the student to gather knowledge on the given design project based on books / literature and websites.
Make the student understand the complexity, functioning and salient features of the design project through organizing field visit, train them to document and present the findings.
Develop design ideas and create them.</td><td>LO1</td><td>Analyze and study, pre-design process, design process & conceptualization stages in design.</td></tr>
<tr><td>LO2</td><td>Understand the materials and technology required to build the same.</td></tr>
<tr><td>LO3</td><td>Understand the building byelaws and apply them to the project.</td></tr>
<tr><td>LO4</td><td>Handle large scale buildings such as projects of progressively increasing complexity.</td></tr>
<tr><td>LO5</td><td>Design the projects based on the concept of space and form, Innovate Visualization of projects using computer software is also acquired.</td></tr>
</table>

REFERENCES

1. “Planning by E. & O.E”. Lliffe book Ltd., London.
2. D.E. CHIRAIRA & CALLENDAR, “Times Saver Standard for Building Types”.
3. RUDOLF HERGE, “Nuferts Architects Data”, Cross By Lockwood & Sons Ltd.
4. EDWARD D. MILLS, “Planning the Architects Hand Book”.
5. National Building Code

2. Adv Building Construction (210712)

OBJECTIVE: The objective of the subject is to introduce the students about the implementation of new technology concepts which are applied in field of advanced construction and also to study different methods of construction in the field of architecture.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210712**	**Adv Building Construction**	**DC- 16**	50	10	20	20	20	20	10	150	4	2	-	2*(1.5)	**5**	Blended *** (3/2)	PP

UNIT-1 SPECIAL STRUCTURES

Definitions, Types – single, double & multilayered grids – two way & three way space grids, connectors, Grids – Domes - various forms - Geodesic domes, Suspended cable structures – types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures – types of pneumatic structures. Long Span bridges, Cables Structure.

UNIT- 2 ADVANCE CONSTRUCTION SYSTEM

Advance construction systems and techniques developed by research organization in In dia- Design and detailing of building materials and components developed by research organizations like CBRI, SERC, NBO & BMTPC.

UNIT- 3 PRE STRESSED CONCRETE

Introduction to pre stressed concrete – Pre stressed concrete materials – Methods of pre stressing - Comparison between RCC and pre stressed concrete.

UNIT- 4 TALL BUILDINGS

Tall buildings structural systems – Rigid frames – Braced frames – Shear wall – Buildings – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Brief outline of their behavior and their applicability for various heights of buildings.

UNIT- 5 SHELLS AND FOLDED PLATES

Basic concepts of Shells – Types –Relative merits and applicability.

Folded plates – Types – Comparison with shells – Applicability. Arches & its types

COs & LOs for Adv Building Construction (210712)			
Overall Course Outcome: Students will be able to **understand** about the implementation of new technology concepts which are applied in field of advanced construction and also to study different methods of construction in the field of architecture.			
CO1	CO1 – As a result of studying about of latest materials and building technologies, structural systems , students will be able to understand use of latest technologies in the construction industry with a fair idea of their environmental performance.	LO1	**Remember** basic concepts of single, double & multi-layered grids – two way & three way space grids, connectors.
		LO2	**Learn** about domes - various forms - Geodesic domes, Suspended cable structures
		LO3	**Understand** the types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures.
		LO4	**Analyze** the types of pneumatic structures. Long Span bridges, Cables Structure.
		LO5	**Evaluating** role of latest materials and building technologies on site investigations, layout, site organization.
CO2	CO2 – As a result of studying about different research organization in India , students will be able to understand the detailing of building materials	LO1	**Remember** advance construction systems and techniques developed by research organization in India
		LO2	**Learn** about design and detailing of building materials and components developed by research organizations
		LO3	**Understand** the methodology of working in research organizations.

	and components developed by these research organizations.	LO4	**Analyze** design and detailing of building materials and components developed by research organizations .
		LO5	**Evaluating** role of latest materials and building technologies developed by research organization on site investigations, layout, site organization.
CO3	CO3 – As a result of studying about Pre stressed concrete materials, students will be able to analyse the use of advanced building construction methods and innovative architectural detailing with new materials.	LO1	**Learn** basic concepts of pre stressed concrete & pre stressed concrete material.
		LO2	**Understand** the methods of pre stressing.
		LO3	**Apply** the pre stressed concrete material on site investigations, layout, site organization.
		LO4	**Analyze** the comparison between RCC and pre stressed concrete..
		LO5	**Evaluating** pre stressed concrete material. through case studies and drawings of selected building types.
CO4	CO4 – As a result of studying about construction details in tall building structure, students will be able to understand the different types of structural methodologies involve in tall building structure.	LO1	**Remember** basic concepts regarding tall buildings structural systems
		LO2	**Learn** the Rigid frames – Braced frames – Shear wall – Buildings – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system
		LO3	**Understand** their behavior and their applicability for various heights of buildings.
		LO4	**Analyze** their behavior in different location.
		LO5	**Evaluating** their applicability for various heights of buildings through case studies and drawings of selected building types.
CO5	CO5 – As a result of studying basic concepts of Shells structure, students will be able to analyze different shells and folded plates and tensile structure for the space coverage.	LO1	**Remember** basic concept of shell structure.
		LO2	**Learn** its types and applicability.
		LO3	**Understand** folded plates structure.
		LO4	**Analyze** types folded plates structure and its Comparison with shells
		LO5	**Evaluating** their applicability through case studies.

REFERENCES:

1. Salvadori
2. Sinha .N.C and Roy .S.K, Fundamentals of Reinforced Concrete, S.Chand& Co. Ltd., New Delhi, 2001
3. Ramamrutham .S and Narayanan .R, Reinforced Concrete Structures, DhanpatRai Publications, New Delhi, 1997
4. Bryan Stafford and Alex Coull, Tall Building Structures, Analysis and Design John Wiley & Sons, New York, 1991
5. Bandyopadhyay .J.N, Thin Shell Structures Classical and Modern Analysis, New Age International Publishers, New Delhi, 1998
6. Ramaswamy .G.S, Design of Construction of Concrete Shell Roofs, McGraw Hill Publishing Company, New York, 19

Note: Total five questions shall be asked. Each question will consist of two parts, one of which will be of 7 marks (which shall be compulsory) and another with 3 marks(which shall be optional).

3. Project Management & Building Economics (210713)

Objective – The course aims to obtain knowledge of Project planning and project scheduling and project controlling, Role of decision in project management, etc.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210713**	**Project Management & Building economics**	**PAEC-3**	50	10	20	20	-	-		100	3	2	1	-	**3**	Offline***	PP

UNIT- 1 INTRODUCTION.

Project planning and project scheduling and project controlling, Role of decision in project management, Method of planning and programming, Human aspects of project management,. Work breakdown structure, Life cycle of a project, Disadvantages of traditional management system. Project management constructional organization, delegation of responsibilities, Role of an Architect, Engineer and Contractor.

UNIT- 2 ELEMENTS OF NETWORK & CPM AND PERT ANALYSIS

Event, Activity, Dummy, Network Rules, Graphical guidelines for network, Numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis

UNIT- 3 PROJECT TIME REDUCTION AND OPTIMIZATION

Project cost, indirect cost, direct project cost, Slope of the direct cost curve, Total project cost & optimum duration, contracting the network for cost optimization, steps in cost-time optimization.

UNIT- 4 PROJECT UPDATING & RESOURCE ALLOCATION

When to update? Data required for updating, steps in the process of updating. Resource usage profile: Histogram, Resource smoothing and Resource leveling.

UNIT- 5 COMPUTERIZED PROJECT MANAGEMENT & PRACTICAL IMPLICATIONS

Introduction: creating a new project, building task. Creating resources and assessing costs, refining your project. Project tracking – understanding tracking, recording actual. Reporting on progress. Analyzing financial progress, Construction site practices, Inspection & quality control.

COs & LOs for Project Management & Building Economics (210713)

Overall Course Outcome: Students will be able to **understand** construction industry practices and project management techniques needed for coordinating building projects professionally.

CO1	CO1 – As a result of studying Project planning, project scheduling and project controlling, students will be able to understand the role of decision making in project management, method of planning and human aspects of project management	LO1	**Remember** basic concepts regarding the Project planning, project scheduling and project controlling.
		LO2	**Learn** the role of decision making in project management, method of planning and human aspects of project management
		LO3	**Understand** the work breakdown structure, Life cycle of a project and disadvantages of traditional management system.
		LO4	**Analyze** project management constructional organization activities and delegation of responsibilities
		LO5	**Evaluating** role of an Architect, Engineer and Contractor in building economics.
CO2	CO2 – As a result of studying Event, Activity, Dummy, Network Rules, Graphical guidelines for network, Numbering of events., students will be able to understand the site investigations, layout, site organization, networking techniques, PERT/CPM, LOB, MS Project	LO1	**Learn** basic concepts regarding Event, Activity, Dummy, Network Rules, Graphical guidelines for network, Numbering of events
		LO2	**Understand** the networking techniques, PERT/CPM, LOB, MS Project
		LO3	**Apply** the networking techniques on site investigations, layout, site organization
		LO4	**Analyze** the Event, Activity, Dummy, Network Rules, Numbering of events on a project.
		LO5	**Draw** all the elements of PERT/CPM **.**

CO3	CO3 – As a result of studying Resource management and value engineering-methods, students will be able to understand the material/ labour estimation, resource scheduling and levelling, construction equipment types and applications	LO1	**Learn** basic concepts regarding Project cost, indirect cost, direct project cost, Slope of the direct cost curve.
		LO2	**Understand** the total project cost & optimum duration, contracting the network for cost optimization, steps in cost-time optimization.
		LO3	**Apply** the cost optimization techniques on site investigations, layout, site organization
		LO4	**Analyze** the total project cost & optimum duration, contracting the network for cost optimization
		LO5	**Evaluating** cost optimization techniques on site investigations, layout, site organization
CO4	CO4 – As a result of studying to Compute the money values and demand forecasting., students will be able to understand the project updating and resource allocation on different steps of a project activities	LO1	**Learn** basic concepts regarding Project monitoring and cost control, manpower management, safety and labour issues.
		LO2	**Understand** the data required for updating, steps in the process of updating.
		LO3	**Apply** project monitoring and cost control, manpower management techniques on site investigations, layout, site organization
		LO4	**Analyze** the Resource usage profile: Histogram, Resource smoothing and Resource levelling.
		LO5	**Evaluating** project monitoring and cost control, manpower management techniques on site investigations, layout, site organization
CO5	CO5 – As a result of studying computerized project management and practical implication , students will be able to understand the on how to enhance the professional ability as an architect in a project	LO1	**Learn** basic concepts regarding new project, building task and creating resources and assessing costs.
		LO2	**Understand** the project tracking activities and to record the progress.
		LO3	**Apply** project tracking activities
		LO4	**Analyze** the financial progress.
		LO5	**Evaluating** construction site practices, Inspection & quality control.

REFERENCES:

1. S.P. Mukhopadyay, “Project Management for architects and Civil Engineers”, IIT, Kharagpur
2. 1974.
3. Jerome D. Wiest and Ferdinand K. Levy, “A Managementuide to PERT/CPM”, prentice hall ofIndian pub. Ltd. New Delhi 1982.
4. SR.A. Burgess and G. White, “ Building production and project management”, the
5. construction press, London 1979.
6. Dr. Punmia and K.K Kandelwal – project planning and control with PERT/CPM, Laxmi publications, New Delhi, 1987
7. Elaine marmel, Microsoft office project 2003 Bible, Wiley Dreamtact (p) Ltd, New Delhi, 2004

4. Estimating and Costing & Specifications (210714)

OBJECTIVE- The objective of the subject is to introduce the students about the successful implementation of the project to know about the material required and cost to be incurred before starting a new project.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210714**	**Estimation, Costing & Specifications**	**PAEC-4**	50	10	20	20	-	-		100	3	2	1	-	**3**	Blended ** (2/1)	PP

UNIT- 1 INTRODUCTION TO SPECIFICATION

Specification - Definition, purpose, procedure for writing specifications for the purpose of calling tenders, types of specification. General specifications for 1St, 2nd, 3rd and 4th Class buildings. Data base for writing specification.

UNIT- 2 SPECIFICATION FOR DIFFERENT ITEMS

Specifications for the following items – Bricks; sand; cement; coarse aggregate; water; reinforcement; storing and handling of materials; Earth work in foundation; PCC; RCC; First class brick work in cement mortar; half brick thick partition in cement mortar; reinforced brick work; DPC; glazed tiles in skirting and dado; cement plaster; joinery in wood, steel &aluminum; painting to walls –emulsion, enamel paint

; painting to joinery ; varnishing ; French polishing ; based on surveys and Current trends.

UNIT- 3 INTRODUCTION TO ESTIMATION

Estimation – definition; purpose; types of estimate; various methods of approximate estimate of buildings with Introduction of computer applications in estimation.

UNIT- 4 DETAILED ESTIMATE

Detailed estimate – data required, factors to be considered, methodology of preparation, abstract of estimate, contingencies, work-charged establishment, bill of quantities, different methods for estimating building works, methods of measurement of works. – With case studies.

UNIT- 5 RATE ANALYSIS

Rate analysis – definition; method of preparation; quantity and labor estimate for unit work; task or outturn work; rate analysis for: earth work, concrete works, first class brick work, reinforced brick work, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling. Using the current market rates for the materials, labor, tools and equipment

COs & LOs for Estimation, Costing & Specifications (210714)

Overall Course Outcome: Students will be able to calculate and estimate the costing of any building based on the material, measurements and specifications, etc.

CO1	Studying specification, students will be able to identify various materials based on specification and apply the understanding generated in their own design.	LO1	**Remember** basic definitions in specification.
		LO2	**Observe** the purpose and types of specification
		LO3	**Understand** general specifications, classes of buildings and database for writing specification.
CO2	Studying this, students will be able to analyze and apply specifications of different material and tasks in	LO1	**Understand** specification of basic construction material for substructure and superstructure.
		LO2	**Identify** classes in brickwork.

	construction in their own design and profession.	LO3	**Analyse** specification for basic construction work such as Dado, joiner, painting, etc. based on surveys and current trends.
CO3	Studying this, students will be able to estimate the approximate and basic construction cost of a building and their own design.	LO1	**Learn** the definition, purpose and types of estimation in architecture.
		LO2	**Identify** various methods of approximate estimate of the building.
		LO3	**Understand** basic application of computer software in estimation.
		LO4	**Apply** the formulas learned into calculating basic estimate of a small-scale building.
CO4	Studying this, students will be able to do detailed estimate of the construction cost of a building and their own design and profession.	LO1	**Learn** the definition, different methods, purpose and data required for preparation of detailed estimate of a building.
		LO2	**Identify** various methodologies for the preparation of detailed estimate of buildings.
		LO3	**Understand** abstract, contingencies and charge establishment, bill of quantities and methods of measurements, in estimation.
		LO4	**Illustrate** the different methods of detailed estimate with the help of case studies of buildings.
		LO5	**Apply** the methods learned into calculating detailed estimate of a small-scale building.
CO5	Studying this, students will be able to rate analysis for different construction works and apply them in their own design and profession.	LO1	**Learn** the definition and methods of preparation of rate analysis.
		LO2	**Understand** quantity and labor estimate, task or outturn work, etc.
		LO3	**Analyse** the rates for various construction work with different class of construction.
		LO4	**Calculate** the rate using the current market rates for the materials, labor, tools and equipments.

REFERENCES:

1. M.Chakraborti, .Estimation, Costing, Specification and Valuation in Civil engineering.
2. Dutta, Estimating and Costing, S. Dutta and Co., Lucknow 1983.
3. PWD Specifications of Tamil Nadu State Government.
4. CPWD Specifications of Government of India.

5. Elective- V

OBJECTIVE-The objective of the subject is to introduce the students about the best teaching learning resources and programs initiated by the Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The course is opted from NPTEL platform in traditional mode.

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted									Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot			MOOC				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation											
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project	Assignment	Exam								
5.	-	ELECTIVE V	DE- 5	-	-	-	-	-	-		25	75	100	3	2	1	-	**3**	Offline *	MCQ

S no	Elective	Sub code	Sub Name	Remark
1	ELECTIVE V			opted from NPTEL platform

Opted from NPTEL platform (July- Dec 2023)

6. URBAN PLANNING (210717)

OBJECTIVES:

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

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
6.	**210717**	**Urban Planning**	**DC**	50	10	20	20	-	-		100	3	2	1	-	**3**	Blended * (2/1)	PP

UNIT- 1 PLANNING CONCEPTS

Role and contribution of the following towards contemporary town planning thought – Geddesian Triad and outlook Tower by Patrick Geddes, City Beautiful by Daniel Burnham, Garden city by Ebenezer Howard, Neighbourhood by C.A.Perry, Radburn by Henry Wright and Clearance stein, Ekistics by CA Doxiadis, City for three million habitat, Radiant city and Chandigarh by Le Corbusier and F.L.Wright

UNIT- 2 CONTEMPORARY ISSUES IN URBAN AND REGIONAL PLANNING

Contemporary problems of settlements, Environmental impact of unplanned growth. Socio-economic aspects of urban housing and problems of slums, rationale of urban regulatory controls. Urban redevelopment and renewal, urban traffic and transportation planning

UNIT- 3 URBAN AND REGIONAL PLANNING

Influence of socio-economic factors in the development of human settlements, growth and decay of human settlements. Classification of settlements: Classification based on population, functions, locations, Municipal status. Town and its land uses, graphical representation and color coding of land use, character of a town, categories of a town, densities of a town, Principles, Advantages and types of Zoning. Scope and purpose of Perspective Plan, Regional Plan, Development Plan, Local Area Plan, Special Purpose Plan, Annual Plan, Project.

UNIT- 4 URBAN GOVERNANCE

Schemes, programs by government, Urban management including various schemes for small and medium towns by GOI. Human resource utilization- through schemes and use of PPP

UNIT- 5 EMERGING TRENDS IN URBAN AND REGIONAL PLANNING

New Urbanism, Smart growth, TOD, Form-Based Codes, Rural village, Transect Future of cities and cities of future - Sustainable cities, Intelligent cities, Liveable cities, Resilient cities, Smart Cities, Global city, Eco city, Compact city, Vertical urbanism, MediCity, Sports city**.**

COs & LOs for Urban And Regional Planning (210717)			
Overall Course Outcome: Students will be able to identify various challenges of urban areas and suggest sustainable planning methods.			
CO1	CO1 – **Elaborate** the dynamics of city growth and development.	LO1	**Study** the concept of urbanization and growth pattern.
		LO2	**Explain** the impact of cities' scale and complexity on National development.
		LO3	**Identify** the issues and challenges of Peri urban and fringe areas.
		LO4	**Examine** the physical and functional linkage between the city, fringe and periphery
		LO5	**Determine** the principal dimensions of urban transformation (economic, social, cultural, physical, environmental, and spatial) and the key interdependencies among these facets of urban change
CO2	CO2 – Student will be able to **elaborate** the role of socio-cultural aspects on growth patterns of city and neighbourhood communities	LO1	**Define** Gender Sensitive Planning, Inclusive Planning, Community Participation
		LO2	**Infer** various settlement policies for rural and urban settlements provided by National Commission on Urbanization and Rural Habitat Policy
		LO3	**Identify** social problems of slums and squatter settlements formed as a result of rapid urbanization and industrialization.
		LO4	**Examine** the impact of social transformation on social life, safety and security in rural and urban areas.
		LO5	**Discuss** the experiences from developing countries regarding settlement structure, growth and spatial distribution.

CO3	CO3 – Student will be able to **propose** sustainable measures of Planning for metro and mega cities.	LO1	**Explain** the concept of Urban Sustainability
		LO2	**Identify** the problems pertaining to urban expansion in metro and mega cities
		LO3	**Examine** the issues and problems of inner city.
		LO4	**Determine** various strategies to achieve inclusivity, equity, improved quality of life and sustainability in metro and mage cities.
		LO5	**Discuss** Transit-Oriented Development as an approach to sustainable development in metro and mega cities.
CO4	CO4 – **Recommend** effective tools and approach for Human Settlement Planning	LO1	**Study** various Urban Development policies and programs
		LO2	**Outline** the role of different agencies/bodies /authorities at different level
		LO3	**Analyse** policies, norms, byelaws and schemes in Indian context.
		LO4	**Determine** the success and failure of various schemes introduced at different levels
		LO5	**Elaborate** the concept of Human Settlement Planning
CO5	CO5 – **Explain** land and real estate development impact on Urban land policies, land use and environment.	LO1	**Learn** dynamics of Urban Land market.
		LO2	**Summarize** land management techniques
		LO3	**Identify** legal aspects of development and their impacts on real estate development.
		LO4	**Analyse** impact on Urban land policies, land use and environment.
		LO5	**Perceive** knowledge on various Environmental Legislations and policies.

REFERENCES:

1. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
2. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van Nostrand Reinhold company
3. Rangwala, Town Planning, Charotar publishing house
4. G.K.Hiraskar, Town Planning
5. Rame Gowda, Urban and Regional planning
6. Town Planning, A.Bandopadhyay, Books and Allied, Calcutta 2000

7. Summer Internship project- III **(04 weeks- Evaluation) (210719)**

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	**210719**	**Summer Internship Project III**	**SEC- 9**	-	-		-	50	-		50	2	-	-	2	**1**	Offline	SO

Seminar / Workshop/ Training during previous summer break will be evaluated

FOURTH YEAR EIGHTH SEMESTER

1. Architectural Design VIII (210815)

Objectives –

The course aims to obtain knowledge of fundamental concepts and theories of Housing and apply them in their design projects, various types of Housing and its components, the vocabulary of urban design, its components. And utilizing it in design.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	**210815**	**Architectural Design VIII**	**DC- 17**	-	-	-	-	100	100	50	250	8	-	-	8*(1.5)	**12**	Offline**	-

PROJECT I: HOUSING

The various types of housing projects in a typical urban scenario can be taken with suitable design parameters that get established after conducting a rigorous study. Analysis of existing design trends & user preferences need to be ascertained. Awareness about special building byelaws applicable for Group housing schemes is essential. In addition to design issues such as security, accessibility, identity, social interaction, comfort, economy etc. that would be investigated. The application of Fractals in design can also be explored. Ex. Housing for the poor /Slum dwellers, Multi-storied apartments for Govt. / corporate employees, Multi-storied condominiums for the rich etc.

PROJECT II: URBAN DESIGN OR CONSERVATION

Urban design projects could deal with redevelopment of problem areas such as riverfronts, beach fronts, market areas, bazaars or commercial & residential districts that have reached dead end situation. It could also deal with emerging nodes of transportation with its surrounding areas, the design of city level open spaces such as parks, plazas etc. Alternatively, conservation strategies for heritage areas along with revitalization techniques can also be attempted. The projects thus undertaken as group work will have to ultimately contribute ideas for the improvement of the quality of the urban environment.

COs & LOs for Architectural Design – VI (210815)

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories of Housing and apply them in their design projects, various types of Housing and its components, the vocabulary of urban design, its components. And utilizing it in design.

CO's	The course should enable the student to: ● Familiarize with given topic of design by choosing appropriate case studies through visits and documentation. ● Understand the resources available at National and international level through books, literatures and websites. ● Develop design ideas and Incorporate them.	LO1	Formulate an intellectual position, explored through architectural design, which reconciles the development of a critical brief with spatial and functional criteria.
		LO2	Conceptualize a brief for a design project, which, through engagement with a series of contexts, seeks to provide a critique of the built environment by proposing alternative spatial, formal, organizational or material solutions.
		LO3	Synthesize a design solution, which combines appropriate architectural expression, cultural response and the fulfillment of the functional requirements of a brief.
		LO4	Produce appropriate drawings, models and other media of an architectural design which explore, test and express its qualities of space, form, organization and response to physical and other contexts.
		LO5	Integrate appropriate technologies concerning structure, materiality and services into the design proposal.
		LO6	Effectively communicate the design or designs through an exhibition incorporating drawings, models, texts and other appropriate media.

REFERENCES:

1. Time saver standards for building types, DeChiara and Callender, McGraw hill company
2. Neufert Architect's data, Bousmaha Baiche& Nicholas Walliman, Blackwell science ltd
3. National Building Code - ISI
4. New Metric Handbook – Patricia Tutt and David Adler – The Architectural Press
5. Time saver standards for landscape architecture – Charles W.Harris – McGraw Hill

2. Urban Design (Code – 210816)

Objective –

The course aims to prepare the students to develop a holistic view of the city as a basis for designing the city/city components in the third dimension.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	**210816**	**Urban Design**	**DC- 18**	50	10	20	20	20	30		150	4	1	1	2	**3**	Blended*** (3/1)	**PP**

UNIT- 1 INTRODUCTION

Emergence of urban design as a discipline, need for urban design, Elements of urban design(buildings, streets, public spaces, transports, other elements etc. Principles of urban design- creating form and spatial definition in articulation of urban design expression.

UNIT- 2 STUDY AND ANALYSIS OF URBAN SPACES IN HISTORY AND MODERN CONCEPTS IN URBAN DESIGN

A brief study and analysis of urban spaces in history-in the west(Greek, Roman, Medieval and Renaissance towns)and the east(in India-Vedic towns, temple towns, medieval and Islamic towns). Modern concepts in urban design. Study of Urban design theories of 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- 3 BASIC PRINCIPLES & TECHNIQUES IN URBAN DESIGN

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- 4 RENEWAL, RE-DEVELOPEMENT AND FORMULATING URBAN DESIGN

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.

UNIT- 5 URBAN DESIGN SURVEY AND PRESENTATION

Conducting an urban design survey of Conservation of historic cities, open-spaces, development of market spaces, transit oriented developments, water front development in India. Analysis of data. Formulating urban design guidelines for an area-practical problem solving, understanding various presentation techniques for urban design presentations.

COs & LOs for Urban Design 210816)

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories of Housing and apply them in their design projects, various types of Housing and its components, the vocabulary of urban design, its components. And utilizing it in design.

CO1	**Understanding** the importance of general morphology of urban space	LO1	**Defining** Urban design as a requirement for public domain
		LO2	**Summarizing** various elements of the subject
		LO3	**Journaling** about public realm
		LO4	**Building** form and spatial definition
CO2	**Understanding** of fundamental concepts and theories of urban design	LO1	**Retrieving** concepts of the west and the east
		LO2	**Categorizing** urban spaces in history
		LO3	**Synthesise** general theoretical models by historians
		LO4	**Assessing** Urban forms of the history and contemporary reform
		LO5	**Creating** presentation of projects from different countries

CO3	**Learning** urban design techniques , components and survey methodology	LO1	**Understanding** components of urban design composition
		LO2	**Examining** methods of visual survey for analysis
		LO3	**Demonstrating** hierarchy of open spaces in urban design context
		LO4	**Programming** on streets and other public spaces
CO4	**Developing** the strategies that can be used to overcome urban issues	LO1	**Defining** urban renewal and urban re-development
		LO2	**Finding** scope in Indian historic towns and cities
		LO3	**Analysing** present documents by governments for new infrastructure and development
		LO4	**Evaluating** urban design guidelines and add new perspectives as required
		LO5	**Presenting** case examples related to urban re-development nationally and internationally
CO5	**Produce a** design process and a design solution to an urban design problem	LO1	**Appraise** a site by learnt survey methods
		LO2	**Analyse** secondary and primary information
		LO3	**Research** relevant developing urban design interventions
		LO4	**Demonstrating** abilities in team work and time management

REFERENCES:

1. The Concise townscape- Gordon Cullen,The Architectural press
2. Image of the city - Kevin Lynch
3. Architecture of town and cities - Paul D.Speriregon, The MIT press
4. Urban design – Ornament and decoration , Cliff Moughtin, Bath Press
5. Urban design – street and square, Cliff Moughtin, Bath Press
6. Town and square - Paul Zucker
7. The urban pattern - Arthur B Gallion, CBS publishers
8. Architecture and the urban experience - Raymond J Curran. Van Nostrand Reinhold Company
9. Indian city in the arid West - KulbashanJain , Aadi Centre
10. Indian mega city and economic reforms - A.K.Jain, Management publishing Company

3. Professional Practice & Ethics (210817)

Objective –

The course aims to obtain understanding of the moral values that ought to guide the Engineering profession, and to resolve the moral issues in the profession, and to justify the moral judgment concerning the profession.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
3.	**210817**	**Professional Practice & Ethics**	**PAEC-5**	50	10	20	20	-	-		100	3	2	1	-	**3**	Blended*** (2/1)	**PP**

UNIT- 1 THE PROFESSIONAL ROLE OF AN ARCHITECT & SERVICES RENDERED

Architect's role in society, IIA code of conduct, salient features of architect's act 1972, the council of architecture – Architect's office and its management, elementary accountancy required for the same etc. Architectural services- conditions of agreement- scope of work, comprehensive architectural services and architectural competitions, conditions of engagement, remuneration, professional fees and charges as per IIA norms, - copy rights of drawings.

UNIT- 2 ARCHITECTURAL COMPETITIONS & LEGISLATIONS

Regulations governing the conduct of competitions, Types of competition (open & closed competitions), appointment & duties of Assessors, instructions to participants, award of premium. Role of development authorities & urban arts commissions, salient features of the DCR for CMA, important regulations in the MP Govt. Environmental acts & laws, special rules governing hill area development & coastal area management, Heritage act of India etc.

UNIT- 3 EASEMENTS& ARBITRATION

Easement Rights –Definition, characteristics of an easement, Natural Rights ,Various easement rights- Easement of support, Easement of light and air, Easement of right of way, Easement of eave projection, etc . Continuous and Discontinuous easements, extinction of easements, Modes of acquiring easement rights – Need for Arbitration, arbitration agreement, role of arbitrators, umpire etc, excepted matters, arbitral award.

UNIT- 4 TENDER & CONTRACT

Calling for Tenders, tender documents, open & closed tenders, various types such as item rate, lump sum, labour & demolition tenders, conditions of tender, submission, scrutiny, recommendations & award of contract. Conditions of contract, IIA form of contract, articles of agreement, certification of contractor's bills, defects liability. Earnest money deposit, security money deposit etc.

UNIT- 5 VALUATION& RENT

Valuation – purpose of valuation, types of valuation- book value – salvage value- scrap value depreciation- obsolescence- sinking fund- land valuation ,building valuation- mortgage and lease- Annuity- definition, Fixation of rent- out going- gross and net income – year's purchase- capital cost standard rent- market rent- economical rent.

COs & LOs for Professional Practice & Ethics (210817)

Overall Course Outcome: Students will be able to get down in the profession and practice ethically.

CO1	With the understanding of the professional role of an architect & services rendered, the students will be able to practice ethically.	LO1	**Learn** the Architects' role in the society.
		LO2	**Relate** IIA Code of Conduct & Architect's Act, 1972 with architectural practice.
		LO3	**Understand** the working of architecture firm, services, scope of work, conditions of agreement, professional fees, remuneration and other professional charges, etc.
		LO4	**Comprehend** copyrights of drawings and other issues related to it.
CO2		LO1	**Learn** the types of competitions and regulations governing it.

	Studying the regulations related to architectural competitions and legislations related to building construction, the students will be able to tackle the issues effectively.	LO2	**Interpret** role of development authorities, commissions and salient features of DCR for CMA
		LO3	**Appreciate** the rules and the acts applied for specific types of building construction by the state and central governments.
		LO4	**Understand** the various Acts such as Environment Act, special rules governing hill area development, coastal area management, Heritage act of India, etc.
CO3	With the understanding of easement and arbitration, the students will be able to work practically once they enter professional world.	LO1	**Learn** easement rights and the types of easement rights and easements.
		LO2	**Construe** the modes of acquiring easement rights.
		LO3	**Appreciate** the need of Arbitration and its role, agreements, umpire, excepted matters, awards, etc.
CO4	Studying the regulations tenders and contract, the students will be able to put tenders and frame contract effectively.	LO1	**Learn** the definition and types of tender in architecture and building construction.
		LO2	**Interpret** conditions of tender, submission and scrutiny.
		LO3	**Recognize** the rules and regulations related to contract, agreements and certification of contractors' bill.
		LO4	**Understand** the various types of money deposits.
CO5	Studying the valuation and rent system will help the students in their professional practice.	LO1	**Learn** the meaning, purpose and type of valuation in architecture and building construction.
		LO2	**Summarize** the mortgage, lease, annuity, etc.
		LO3	**Understand** the system of renting and types of rent.

REFERENCES:

1. Hand book on Professional Practice by I. I. A, Image systems, Mumbai,1998.
2. Estimating and Costing by Dutta
3. CMDA-Development control rules for CMA.
4. TN cinematograph manual, govt central press, Chennai,1998.
5. Environmental Acts of the Ministry of Environment & forests, GoI.

4. Dissertation (210818)

Objective –

The course aims to obtain understanding of standards and conventions of doing dissertation. , to provide preliminary background information that puts the research in context and to clarify the focus of the study. The subject points out the value of research.

S. No.	Subject Cod	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
4.	**210818**	**Dissertation**	**PAEC-6**	-	-		-	20	30		50	4	-	-	4	**2**	Blended*** (2/2)	-

PHASE-1

First phase of dissertation allows students to identify the broad area / field of Architecture of their interest in which they may intend to do the research. This is to be done by studying and reproducing the brief of technical papers in the form of report review.

PHASE-2

Second phase allows the students to do the study of sample example of research already done by choosing the specific aspect / area relevant to broader field they have selected in first phase. This exercise involves the writing of report / review of book / journal dedicated to that specific aspect or area. This review writing is aimed to understand the method of collecting data (survey methods), analysis of data (statistics and mathematical formulas), drawing inferences and conclusion as attempted by the author of the book.

PHASE-3

Third phase is the writing of detailed dissertation report. Students are expected to choose their own topic of research by referring the area / field already identified in other two phases.

NOTE: Sessionals will be submitted in the form of review reports and Dissertation report.

COs & LOs for Dissertation – VI (210818)

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories and to develop research ideas and Incorporate them in writing, with understanding of research and professional and academic reports.

CO 1, 2, 3	The course should enable the student to: ● Familiarize with given topic of research by choosing appropriate case studies through visits and documentation. ● Understand the resources available at National and international level through books, literatures and websites. ● Develop research ideas and Incorporate them.	LO1	Understand the fundamentals of Research methods before attempting final year Project Thesis.
		LO2	Study and develop basic research principles and research methods.
		LO3	Develop a sustained and coherent argument on an agreed topic, supported by both secondary and primary sources
		LO4	Communicate the result of a systematic programme of research with clear identification of the topic, research issues, the context and the theoretical perspectives.
		LO5	Evaluate significant information sources referred to and draw coherent conclusions relevant to the topic and issues initially identified, from the observations, evidence and arguments presented.
		LO6	Develop the skill of report writing. Prepare a Dissertation report

LIST OF TEXT AND REFERENCE BOOKS:

Instruction Manuals on report writing

5. Elective – VI

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
5.	-	ELECTIVE VI	DE- 6	50	10	20	20	-	-		100	3	2	1	-	**3**	Blended * (2/1)	**PP**

i) FURNITURE DESIGN

Objective – The course aims to obtain knowledge of the creation and evolution of objects, structures and systems at human scale that *aim* to improve the quality of life in the immediate living and working environment, while looking at sustainable and innovative use of diverse materials and processes. The course aims to obtain knowledge of how to plan, finance and manage urban areas. Structures supported by effective land markets, appropriate regulation, good public services, adequate public finance and transparent and accountable city level political systems.

UNIT-1 INTRODUCTIONTO ERGONOMICS AND FURNITURE DESIGN

Introduction to importance of ergonomics for human being in man-made world, Gross human anatomy, Ergonomics for different age group and gender in relation object used in interior.

UNIT-2 HUMAN FACTORSAND FURNITURE DESIGN

Brief study of Anthropometrics –man –machine-environment, static and dynamic, Muscles and work physiology, Static and Dynamic work including maximum capacity , Furniture ergonomics for differentage group and gender.

UNIT-3 ERGONOMIC FOR BUILT ENVIRONMENT

Built environment for the physically handicapped – Ramp, toilets and corridor design, Spatial Requirements for wheel chair movement-Design issues in the design of old age homes – Criteria tobe considered when designing for the Visually handicapped.

UNIT-4 ENVIRONMENTAL ERGONOMICS

Study of Biomechanics, Environmental Condition including, thermal, illumination, noise and vibration,Bio transducers Environmental stress, Psycho Psychological aspects of design.

UNIT-5 ERGONOMICS FOR FURNITURE DESIGN

Study Of Furniture ergonomics for different space like, office , residential, children, Aged and Physically and visually handicapped user.

COs & LOs for Furniture Design

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories and to develop and design Furnitures.

CO1	**Developing** a good understanding about furniture elements and design principles	LO1	**Understanding** furniture design process
		LO2	**Understanding** behaviour psychology and perception
		LO3	**Discussing** elements of evolution of creativity in furniture design
		LO4	**Explaining** basic design principle, multiple dimensions and concepts of furniture design
CO2	**Understanding** the intricacies of interior area coming up with the furniture requirements and its historical background	LO1	**Remembering** history of furniture in western context
		LO2	**Relating** interior space planning and its historical background with respect to furniture design
		LO3	**Reflecting** knowledge on furniture design eras and movements
		LO4	**Reproduce** with the help of illustrations, craft of various Indian Folk
CO3	**Understanding** of various elements of furniture design in contemporary context so that efficient design can be achieved	LO1	**Identifying** various furniture design elements
		LO2	**Learning** the ergonomics of furniture design
		LO3	**Analysing** the Universal Design Ideas
		LO4	**Correlating** the design for all nad built environment for physically handicapped with respect to furniture design
		LO5	**Solution of** furniture design issues in old age homes
CO4		LO1	**Learn** the study of biomechanics

	Elaborate concept of exterior furniture and landscaping elements	LO2	**Judging** effect of environment and psychological effects of furniture design
		LO3	**Illustrating** different furniture design for such places
CO5	**Developing** confidence to build furniture for according to usage	LO1	**Associating** human scale with furniture and given space
		LO2	**Implementing** furniture design for comfort and proper functioning
		LO3	**Charting** about material type for office, children, residence
		LO4	**Experimenting** with different materials for changing trends and lifestyles
		LO5	**Create** different furniture designs for different spaces

REFERENCES:

1. De Chiara and Callender - Time Savers Standards for Building Types
2. De Chiara and Callender - Time Savers Standards for Architectural dataJulius penero and Martin Zelnik,"Human Dimensions and Interior Space"Whitney Library Of Design,NY 1979.
3. Time Saver Standards for Interior Design.
4. An invitation to Design, Helen Marie Evans.
5. Francis D.K.Ching, Interior Design Illustrated, VNR Publications, New York, 1987

ii) SUSTAINABLE INTERVENTIONS IN HISTORIC BUILDINGS

Objective –

The course aims to obtain knowledge of the creation and evolution of Architectural Conservation in India as well as in western world. It aims to explore the methods of Documentation as well as analysis for Intervention. This course aims to develop an overall understanding of the process of Historic conservation and Preservation.

UNIT-1 INTRODUCTION TO HISTORIC BUILDINGS

- Definition of Historic Buildings.
- Definition of Heritage.
- Why Intervention? Justification.
- Concepts of Values, Significance, Authenticity and Integrity.
- Conservation. Ethics in Conservation.

UNIT-2 RESEARCH IN INTERVENTIONS & CRITICAL ANALYSIS OF HERITAGE COMPONENTS

- Importance of Research in Heritage Conservation.
- Sources of information like books, archival photographs and maps, folklores, mythology, oral tradition and memories.
- Understanding the Scales of various heritage components: Buildings, Areas, and Towns, Region (Local, National, and International).

UNIT-3 DOCUMENTATION & DEGREES OF INTERVENTION IN HISTORIC BUILDINGS AND MONUMENTS

- Introduction to Heritage Database and Surveys for conservation
- Listing and Inventories
- Measured Drawing: Techniques of Measurement, Drawing and Presentation
- Photographic Documentation
- Degrees - Prevention of deterioration, Preservation of the existing state, Consolidation of the fabric, Restoration, Rehabilitation, Reproduction, Reconstruction

UNIT-4 DECAY AND REMEDIES

- Introduction to Decay in Cultural property, Materials and Structural failures
- Internal and External environment of historic buildings
- Climatic causes of decay
- Botanical, biological and microbiological causes of decay
- Insects and other pests as causes of decay
- Man-made causes of decay

UNIT-5 WHAT IS SUSTAINABLE INTERVENTIONS & DESIGNING IN HISTORIC CONTEXT

- Sustainable Interventions & its steps.
- Concepts of: - Imitation, Inspiration, Innovation, Influence, Evolution, New Design.

COs & LOs for Furniture Design

Overall Course Outcome: The course aims to obtain knowledge of fundamental concepts and theories of Sustainable interventions which can be applied in historic buildings.

CO1	Students will be able to understand the basic terminology of the subject.	LO1	**Understanding** basics of historic buildings
		LO2	**Understanding** definitions of Heritage
		LO3	**Discussing** the need of Interventions
		LO4	**Understanding** the concept of values, significance, authenticity, integrity and ethics
CO2	Students will be able to **i**dentify the stylistic characteristics of architecture, theories and importance of research	LO1	**Recalling** importance of research in Heritage Conservation
		LO2	**Relating** the sources of information and research
		LO3	**Reflecting** knowledge on various heritage components
CO3	Students will be able to understand the documentation techniques and degrees of intervention	LO1	**Identifying** various ways of collecting heritage database
		LO2	**Learning** the types of surveys, listing and documentations
		LO3	**Analysing** the type suitable for certain type of heritage
		LO4	**Correlating** the degrees of intervention with the condition of the heritage
		LO5	**Apply** the knowledge in documenting and assessing a heritage

CO4	Students will be able to elaborate concept of & types of Decay in a building and their remedies.	LO1	**Learn** the different types of decays in heritage building and precinct
		LO2	**Judging** effect of the different types of decays in heritage building and precinct
		LO3	**Illustrating** of the different types of decays in heritage building and precinct in a heritage building and precinct
CO5	Students will be able to design in Historic Context keeping in mind the sustainable solutions	LO1	**Associating** sustainability with historic design concepts
		LO2	**Implementing** sustainability in interventions of heritage building and precinct
		LO3	**Assessing** and applying concepts of , Inspiration, Innovation, Influence, Evolution, New Design

REFERENCES:

1. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, London.
2. Sigfriedgiedion, .Space time and Architecture: The Growth of a new tradition, Harvard University Press.
3. Tzonis Alexander, Santiago calatrova, International Publications, January 2005, New York.
4. Steele James, Hassan Fathy - The complete works,London: Thames and Hudson.
5. Conservation of Historic Buildings by Fielden,Bernard, 2003, Architectural Press.
6. Guidelines for Conservation by Fielden, Bernard, 1989, INTACH, New Delhi.
7. Historic England, Practical Building Conservation: Conservation Basics, 2013, Routledge.
8. Contemporary Theory of Conservation by Salvador Munoz-Vinas, 2005, Elsevier.
9. Recording, Documentation, and Information Management for the Conservation of Heritage Places- Guiding Principles by Letellier, Robin, 2007, Getty Conservation Institute. Los Angeles.

(iii) ENVIRONMENT & ARCHITECTURE

Objective –

The course aims to obtain knowledge about Environmental studies and protection from rapid growing anthropogenic activities. Exploring various Architecture Techniques to mitigate them.

UNIT-1 INTRODUCTION TO THE STUDYOF ENVIRONMENT & URBAN DEVELOPMENT

Introduction, Concepts and Function: Introduction to environment, its meaning and growing importance in daily life. Built – Environment relationship.

UNIT-2 RELATIONSHIP BETWEEN ARCHITECTURE AND URBAN ENVIRONMENT

Role of Architects and Planners in Building Resilient Cities. Scope and Challenges in Indian Context.

UNIT-3 URBAN CHALLENGES

Urban Challenges to the Environment. Concepts like Waste management, Urban Heat Island Effect, Energy consumption, Climate change etc.

UNIT-4 GREEN RATING SYSTEMS IN ARCHITECTURE

Introduction to Green Rating Systems in India and Abroad. Criteria for listing under GRIHA LEAD, IGBC Etc

UNIT-5 ENVIRONMENTAL IMPACT ASSESSMENT

Introduction to Environmental Impact Assessment (EIA), Process including Scoping, Screening, Establishing Baseline conditions, Case examples.

COs & LOs for Environment & Architecture

Overall Course Outcome: The basic objective of this course is to develop the student's understanding towards the importance of ecological studies and environmental protection from rapidly growing anthropogenic activities. This course would let the students explore various architectural techniques in mitigating environmental degradation and achieving sustainable living.

CO1	Students will be able to **summarize** elementary knowledge to earth's natural environment and Urban Development	LO1	**Define** basic terms used in Environmental Stufy.
		LO2	**Outline** the relationship between built and Environment.
		LO3	**Analyze** the concept of Environmental studies.
		LO4	**Conclude** the various factors impacting environmental degradation, climate change, carbon footprint, relationship with human beings and built, Urban Development, etc.
CO2	Students will be able to **highlight** emerging human activities relating architecture & urban environment	LO1	**List** various human activities since industrialization till date impacting nature.
		LO2	**Demonstrate** impact of such activities with the help of suitable case examples
		LO3	**Analyze** the relationship between man and its natural surroundings, focusing on negative impacts of manmade activities on the environment.
		LO4	**Evaluate** the need of environmental protection and economic activities
CO3	Students will be able to **relate** urban ecology with its challenges.	LO1	**Define** ecology in terms of growing urbanization and technological advancement
		LO2	**Summarize** the need of alternative technologies to harmonize nature.
		LO3	**Develop** environmental sensitivity
		LO4	**Examine** application of available alternatives
CO4	Students will be able to **perceive** the role of green rating systems in architecture	LO1	**Recollect** the Green rating systems in India and abroad
		LO2	**Exemplify** the application Green rating systems in Architecture
		LO3	**Relate** various practical purpose of ecology and environment in the field of architecture and planning
		LO4	**Apply** the various Green rating systems
CO5	Students will be able to **assess** the Environmental Impact	LO1	List various factors of EIA and its process
		LO2	Assess the Environmental Impact over an area or specific region.

REFERENCES:

1. Fundamentals of Ecology by E.P. Odum
2. Review Our Dying Planet by Sarala Devi
3. Ecological Crisis: Reading for Survival by G. A. Love & R.M. Love

6. Elective- VII

OBJECTIVE-The objective of the subject is to introduce the students about the best teaching learning resources and programs initiated by the Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The course is opted from NPTEL platform in traditional mode.Elective- V

S. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted									Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot			MOOC				L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation											
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project	Assignment	Exam								
6.	-	ELECTIVE VII	DE- 7	-	-	-	-	-	-		25	75	100	3	2	1	-	**3**	Offline *	MCQ

S no	Elective	Sub code	Sub Name	Remark
1	ELECTIVE VII			opted from NPTEL platform

Opted from NPTEL platform (July- Dec 2023)

7. Seminar / Workshop/ Training

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Exam	Mode of Teaching (Offline/ Online)
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
7.	210819	Tour/ seminar / NASA/Workshop/ aining during wint break	SEC- 10	-	-		-	50	-		50	50	-	-	2	**1**	Offline	SO

Tour/ seminar/ Workshop/ Training during winter break will be evaluated in VIII semester

FIFTH YEAR NINTH SEMESTER

1. Professional Training (210911)

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	210911	Professional Training	PAEC-7	-	-	-	400	300	-	-	800	40	-	-	40	**20**	Off-campus	SO

2.Thesis Project I (210913)

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam
				Theory Slot				Practical Slot										
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation				L	T	P			
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
2.	210913	Thesis Project I	PAEC-8	-	-	-	50	50	-	-	100	4	-	-	4	**2**	Offline	SO

FIFTH YEAR TENTH SEMESTER

1. Professional Training (210911)

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	211011	Thesis Project	DC-19	-	-	-	-	250	400	-	650	-	-	-	12*(1.5)	**18**	Blended **(14/4)	SO

2. Professional Training (210911)

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	210911	Professional Training	PAEC-7	-	-	-	400	300	-	-	700	-	-	-	40	**20**	Off-campus	SO

3. Professional Training (210911)

. No.	Subject Code	Subject Name	Category	Maximum Marks Allotted							Total Marks	CT HRS	Contact Periods per week			Total Credits	Mode of Teaching (Offline/ Online)	Mode of Exam
				Theory Slot				Practical Slot					L	T	P			
				End Term Evaluation		Continuous Evaluation		End Sem. Exam	Continuous Evaluation									
				End Sem.	Proficiency in subject/ course	Mid Sem.	Quiz/ Assignment /Sessional		Lab work & Sessional	Skill based mini project								
1.	210911	Professional Training	PAEC-7	-	-	-	400	300	-	-	700	-	-	-	40	**20**	Off-campus	SO