MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
(Deemed University)
(Declared Under Distinct Category by Ministry of Education, Government of India)
NAAC Accredited with A++ Grade

BACHELOR OF ARCHITECTURE

II SEM SYLLABUS

First Year Second Semester

1. **Graphics II (Code - 21251201)**
2. **Graphics Studio I (Code - 21251207)**

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Exam	Duration Exam.
				Theory Block				Practical Block									
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation		L	T	P				
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
1.	21251201	DC	Graphics II	25	25	20	30	-	-	100	2	-	-	2	Face to Face	PP	3H
7.	21251207	DLC	Graphics Studio II	-	-	-	-	70	30	100	-	-	4	2	Experimental	SO	

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

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

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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3		2			2		3	3	3				
CO2	3		2			2		3	3	3				
CO3	3		2			2		3	3	3				
CO4	3		2			2		3	3	3				
CO5	3		2			2		3	3	3				

1- Slightly, 2- moderately, 3- Substantially

3. **Building Construction I(Code -21251202)**

4. Building Construction (Studio I)(Code -21251206)

Objectives – 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.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode f Exam
				Theory Block				Practical Block								
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation		L	T	P			
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional								
2.	21251202	BSC	Building Construction I	25	25	20	30	-	-	100	2	-	-	2	ace to Fac	PP
6	21251206	DLC	Building Construction (Studio I)					70	30	100	-	-	2*	3	xperimen l	So

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 FOUNDATION AND EXCAVATION

- Introduction to foundation and its types, function and design factor.
- Detail of stepped brick and stone foundation.
- Excavation: Timbering to trenches. Tools, plants and equipment for excavation.

UNIT-3 MASONRY AND OPENINGS

- Types of bricks and stone and their uses. Definition and types of masonry.
- Various types of bond: English, Flemish & rat trap bonds for various thickness of wall .
- Detail of right angle, T- Junctions,stop end wall.
- Details of garden wall bond & ornamental bond.
- Stone: Types of stone masonry (random rubble and ashlar).
- Piers and Quoins.
- Plastering & Pointing, corbels, Damp proof courses and copings.
- Arches in brick and stone: flat, segmental, semi-circular and pointed.
- Lintels and sills: In brick and stone.

UNIT-4 INTRODUCTION OF BASIC BUILDING COMPONENTS

- Cross-section of a G+1 building to understand foundation, plinth beam, flooring, sill, lintel, slabs, parapet & weathering course

UNIT-5 ROOFS

- Simple configurations and details of various forms of roofs: Flat, sloped, pyramids and dome.
- Jack arch roofing, stone roofing system.

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	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.

	the strength, performance and life of the structure.	LO5	**Produce** construction detail of foundation and walls in mud-rammed earth and compact earth blocks.
CO2	Students will be able to **understand** the types and properties of foundation by studying its types and excavation.	LO1	**Learn** various types of foundation in Brick and stone.
		LO2	**Understand** the use of different types of foundation depending upon usage.
		LO3	**Develop** a fundamental understanding of types of excavation in timber.
		LO4	**Analyze** the details of foundation with respect to soil type.
		LO5	**Produce** details of foundations in Stone, Brick and excavation through trenches.
CO3	Students will be able to **understand** the importance of walls in building, how they give security, divide available space of building to fulfill 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 ,quoins,pointing and plastering.
		LO5	**Produce** construction details of walls and piers.
CO4	Students will be able to **understand** the different building components and analyze its detailed drawings.	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	**Classify** the components based on their arrangements, method or manner of construction, working operations and material.
		LO4	**Analyze** the use and properties of various components.
		LO5	**Produce** the drawings of the cross section of the building to understand the components.
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***
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).

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	3	3	2	1	2	2		2	
CO2	2	1	2	1		1		2			2	
CO3	2	1	2	1		1		2			2	
CO4	2	1	2	1		1		2			2	
CO5	2	1	2	1		1		3	2		2	

1- Slightly, 2- moderately, 3- Substantially

3. Structure II (Code – 21251203)

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.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Exam
				Theory Block				Practical Block			L	T	P			
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation							
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional								
3.	21251203	ESC	Structure II	25	25	20	30	-	-	100	2	1	-	3	ace to Fac	MCQ

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, New York, 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, New York,. (1966)
6. Rowland J. Mainstone, Developments in Structural form, Architectural press, Oxford, 1975.1999

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	1				2		1		
CO2	2	2	3	1				2		1		
CO3	2	2	3	1				2		1		
CO4	2	2	3	1				2		1		
CO5	2		3	1		1		2		1		

1- Slightly, 2- moderately, 3- Substantially

4. History of Indian Architecture (Code – 21251204)

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.UNIT-1 EVOLUTION OF HINDU TEMPLE ARCHITECTURE:

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Exam	Dura of
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
4.	21251204	DC	History of Indian Architecture	25	25	20	30	-	-	100	2	1	-	3	Face to Face	MCQ	1.5

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.). Examples of Orissa Temple Style, Madhya Temple Style, Gujarat Temple Style, North Temple Style, 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 various dynasties), Gopurams.

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 & Provincial 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 Mughal 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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	1	3	1	1			1		
CO2	1	1	2	1	3	1	1			1		
CO3	1	1	2	1	3	1	1			1		
CO4	1	1	2	1	3	1	1			1		
CO5	1	1	2	1	3	1	1			1		

1- Slightly, 2- moderately, 3- Substantially

5. Design Studio I(Code – 21251205)

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	Contact Hours per week			Total Credits	Mode of Learning	Mode of Exam	Exam
				Theory Block				Practical Block			L	T	P				
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation								
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional									
6.	21251205	DLC	Design Studio I	-	-	-	-	70	30	100	-	-	4*	6	Experiment al	SO	-

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

- Architectural elements & relevant architectural terms
- Space planning (response to user & purpose with logic & application of standards)
- Material, form & structure
- 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

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	1		1						
CO2	3	3	1	3		1	1		3			
CO3	3	3	1	3		1	1		3			

1- Slightly, 2- moderately, 3- Substantially

6. Semester Proficiency (Code – 21251208)

Objectives – The course aims to assess the cumulative knowledge and skills acquired by students over the semester in various core subjects, ensuring they meet academic benchmarks.

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks
				Theory Block				Practical Block		
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional		
8.	21251208	SP	Semester Proficiency*	-	-	-	-	50	-	50

This course evaluates the overall proficiency of students across architectural design, theory, and practical applications, promoting a holistic understanding and competence in architectural practices.

7. Micro Project-II# (WorkshopII)(Code –21251209)

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.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks
				Theory Block				Practical Block		
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional		
9.	21241209	PBL	Micro Project-I# (Workshop II)	-	-	-	-	70	30	100

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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	1				3	2			
CO2	2	1	1	1				3	2			
CO3	2	1	1	1				3	2			
CO4	2	1	1	1				3	2			
CO5	2	1	1	1				3	2			

1- Slightly, 2- moderately, 3- Substantially

8. Novel Engaging Course (Activity Based Learning) (Code – NEC00002)

Objectives – The course aims to offer students a chance to acquire interdisciplinary skills beyond the architectural curriculum, fostering creativity and adaptability. .

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks
				Theory Block				Practical Block		
				Continuous Evaluation			Major valuatio	Continuous Evaluation	Major Evaluation	
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional		
10.	NEC0002	NEC	Novel Engaging Course (Activity Based Learning)	-	-	-	-	-	50	50

These courses allow students to opt for skill-based learning from various departments, encouraging holistic development through subjects like photography, graphic design, or entrepreneurship, enriching their architectural skill set.

9. Skill Internship Program (Code- SIP001)

Objectives – The course aims to instill ethical and humanistic values in students, preparing them for responsible professional conduct and community engagement.

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks	C
				Theory Block				Practical Block			
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation		
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional			
13.	SIP0001	SIP	Skill Internship Program					60	-	60	

This course focuses on developing a moral and ethical framework for decision-making in architecture, fostering a sense of responsibility towards society,

10. Mandatory Workshop onSustainability & Environmental Science (Code – 21251210)

Objectives – The course aims to familiarize students with the Indian Constitution and traditional knowledge systems, emphasizing their relevance in contemporary architectural practice.

S. No.	Course Code	Category Code	Course Name	Maximum Marks Allotted						Total Marks
				Theory Block				Practical Block		
				Continuous Evaluation			Major Evaluation	Continuous Evaluation	Major Evaluation	
				Minor Evaluation I	Minor Evaluation II	Quiz/ Assignment		Lab Work & Sessional		
12.	21251210	MAC	Sustainability & Environmental Science	25	25	20	30	-	-	100

Course Objectives:

To equip students with a comprehensive understanding of environmental science, pollution control, sustainability, and global frameworks, enabling them to analyze environmental challenges and contribute to sustainable solutions through informed decision-making and responsible practices.

SYLLABUS

Unit I

Introduction to Environmental Science: definition, importance and its components. Ecosystem and its components. Water cycle, carbon cycle, food chain, energy flow in ecosystem. Current state of environment in India and world; Underlying reasons (root causes) of modern environmental degradation (social, psychological, cultural).

Unit II

Environmental Pollution and Management: air, water, noise, soil, thermal and radioactive. Causes, impacts, pollution control techniques and mitigation strategies. Solid waste management: Principles of waste management, different components of waste management system and introduction to management of hazardous waste like e-waste, plastic waste. Global environmental Issues: Climate change, global warming, ozone layer depletion.

Unit III

Environmental policies and laws in India: Environmental Protection Act, Water Act, Air Act. **Overview of global environmental policies and frameworks**: Kyoto protocol, Montreal protocol, COP summits. Introduction to clean development mechanism, carbon credit, carbon trading.

Unit IV

Sustainability concepts: definition, importance, pillars of sustainability (economic, environmental, and social). Sustainable development. Overview of UN Sustainable Development Goals (SDGs) and their global relevance. Concept of circular economy, resource efficiency, energy conservation, green buildings and sustainable manufacturing.

Unit V

Sustainable Energy solutions: New Energy Sources: Need of new sources. Different types new energy sources. Applications of- Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy. Introduction to sustainable transportation systems and sustainable water infrastructure.

Course Outcomes:
Upon completion of the course the student will be able to:
CO 1: Explain the fundamental concepts of environmental science, including ecosystems and the causes of environmental degradation.
CO 2: **Analyze** the sources, causes, and impacts of air, water, and solid waste pollution and propose appropriate mitigation strategies.
CO 3: **Evaluate** the effectiveness of environmental policies and global frameworks in addressing environmental challenges.
CO 4: **Explain** the concepts of sustainability and sustainable development goals.
CO 5: **Apply** various solutions for achieving sustainable development.

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	-	-	-	-	-	1	-	-	-	-	1	-	-
CO2	2	2	2	-	-	-	3	-	-	-	-	2	-	-
CO3	-	-	1	-	-	2	2	-	-	-	-	2	-	-
CO4	-	-	-	-	-	-	2	-	-	-	-	2	-	-
CO5	2	2	2	-	-	1	3	-	-	-	-	2	-	-

1 - Slightly; 2 - Moderately; 3 – Substantially

Reference Book

1. D. K. Asthana, Meera Asthana, A Text Book of Environmental Studies, S Chand & Co., New Delhi.

2. S. K. Dhameja, Environmental Engineering & Management, S K Kataria & Sons, New Delhi

3. C. S. Rao, Environmental Pollution Control Engineering, C.S. Rao, New Age International Publishers

4. A. K. Gupta, Environmental Sustainability and Green Technologies, PHI Learning.

11. Mandatory Workshop on Career Planning and Goal setting (Duration: Two Days)
(Code – 21251212)

Annexure III

Micro Project-II (Workshop I) (Code –21241209)

S.NO	ASSIGNMENTS	CO'S
1.	**ASSIGNMENT 1 — FORM EXPLORATION THROUGH MATERIALS** **(Based on Unit 1: Model Making)** **Aim** To understand how different materials behave in three-dimensional form exploration. **Assignment** Create **three conceptual models** using any three of the following: • Clay • Plaster of Paris (POP) • Metal scrap / metal sheet • Jute fibre • Matchsticks/wires (for space frames) Each model must represent a **different structural/form concept**, such as: • Space frame • Shell roof • Tensile form • Origami fold Submit **one model inspired by a famous building**, using any technique/material learned. **Deliverables** ● Models (minimum 4) ● A3 sheet with photos + material behaviour notes + form analysis	CO1
2.	**ASSIGNMENT 2 — CNC MODEL CONSTRUCTION** **(Based on Unit 2: CNC Cutting and Fabrication)** **Aim** To introduce precision cutting through CNC and understand its application in architectural model making. **Assignment** ● Prepare drawings (plan/elevations/sections) of a **simple pavilion or block model**. ● Generate CNC-ready linework (DXF/SVG). ● Use the CNC machine to cut components from **selected board types** (mountboard/ply/foamboard). ● Assemble the model with accurate joints and tolerances. **Deliverables** 1. CNC-cut architectural model 2. Set of CNC files + process sheet 3. Reflection note on precision, limitations, and material usage	CO2
3.	**ASSIGNMENT 3 — BLOCK MODEL OF A BUILDING / URBAN COMPOSITION** **(Based on Unit 3: Introduction to Architectural Model Making & Block Modelling)** **Aim** To understand volumetric abstraction and spatial hierarchy through block modelling. **Task** ● Choose any one: o A small institutional building o A housing unit/cluster o A 3D abstract composition ● Prepare a **baseboard** using wood or thick mounting board. ● Create a **block model** using mountboard/clay/foam blocks.	CO3

	● Focus on massing, proportions, and spatial relationships, not details. **Deliverables** ● Block model with base ● Sketches explaining form development ● 2–3 photographs (top view, eye level, oblique)	
4.	**ASSIGNMENT 4 — DETAILED ARCHITECTURAL MODEL** **(Based on Unit 4: Detailed Modelling)** **Aim** To learn detailed representation of architectural elements and site components. **Assignment** ● Choose a **small building or part of a building** (e.g., entrance pavilion, façade segment, residential block). ● Create a **detailed physical model** including: o Walls, columns, windows/glazing o Steps, railings, sunshades o Surface finishes (brick/stone/stucco) o Site elements (contours, roads, trees, water body, street furniture) ● Use materials such as mountboard, snow-white sheet, acrylic, and texture papers. **Deliverables** 3. Detailed model 4. A3 layout with: • Material palette • Scale used • Photographs + site context representation	**CO4**
5.	**ASSIGNMENT 5 — ARCHITECTURAL PHOTOGRAPHY OF MODELS** **(Based on Unit 5: Photography)** **Aim** To learn how to document architectural models effectively through photography. **Assignment** ● Photograph any **two models** you created in earlier assignments. ● Apply architectural photography principles: o Lighting (natural or artificial) o Background setup o Depth of field o Angle selection (eye level, worm's eye, aerial, sectional) ● Basic post-processing allowed (contrast, cropping, colour balance). **Deliverables** ● Minimum **8 photographs** (4 per model) ● A3 sheet describing: o Camera settings used o Lighting techniques o Rationale behind composition	**CO5**