Periyar Nagar, Vallam, Thanjavur - 613 403
Tamil Nadu, India
Phone: +91 - 4362 - 264600
Fax: +91 - 4362 - 264660
Email: registrar@pmu.edu
Web: www.pmu.edu

PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
think • innovate • transform

Faculty of Architecture and Planning

Department of Architecture

M.Arch.

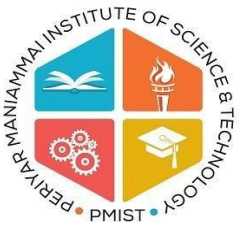
General Architecture

Curriculum & Syllabus

I - IV semesters

Regulations 2024

PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY
Vallam, Thanjavur – 613403



PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY

Periyar Nagar, Vallam, Thanjavur - 613403

Tamil Nadu, INDIA.

Periyar Maniammai Institute of Science & Technology is committed to imparting quality education, emphasizing the integration of proficiency and human values, along with the ongoing enhancement of educational quality.

Vision Statement:

To be a university of global dynamism with excellence in knowledge and innovation, ensuring social responsibility for creating an egalitarian society.

Mission:

- Offering well-balanced programs with scholarly faculty and state-of-the-art facilities to impart a high level of knowledge.
- Providing student-centered education and fostering their growth in critical thinking, creativity, entrepreneurship, problem-solving, and collaborative work.
- Engaging in progressive and meaningful research with a focus on sustainable development.
- Empowering students to acquire the skills necessary for global competencies.
- Instilling universal values, self-respect, gender equality, dignity, and ethics.

Quality Policy:

To be a leading institution of excellence in education and research, providing professional competence to meet academic, scholastic, and societal needs

Objectives:

- To provide value-based education with social responsibility and ethics to both urban and underserved rural students.
- To achieve excellence in education and empower students to attain global competence.
- To promote a culture of research and innovation in young minds, fostering academic excellence, and encouraging lifelong learning.
- To engage in specialized areas with a proven ability to make distinctive contributions to the objectives of the higher education system across diverse disciplines.
- To engage in extramural studies, extension programmes, and field outreach activities to contribute to the development of society.

The Motto:

THINK – INNOVATE – TRANSFORM

VISION MISSION OF THE DEPARTMENT

Vision Statement:

To be a unique department in creating eminent Architects with excellent creativity and sound technical knowledge, competent enough for adapting to the changing trends and culture of mankind and in turn applying them for the societal needs with environmental consciousness.

Mission:

- To produce Undergraduate, Postgraduate and Research scholars in Architecture on par with current Global demands and trends.
- To inspire and provide challenging ambience to evolve as leaders to advance in the field of Architecture.
- To provide a platform for innovation, critical thinking and research in the field of architecture and allied disciplines.
- To serve as a reliable, highly capable resource for the profession, academia, and society

M.ARCH – MASTER OF ARCHITECTURE

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1	A successful professional to lead and coordinate the project team consisting of professionals from different disciplines in the design and execution of projects irrespective of the scale locally and globally.
PEO2	Able to understand the societal and individual's spatial needs and requirements with respect to the context, their culture and tradition and to come up with innovative unique and aesthetical design solutions.
PEO3	An environmentally and socially responsible person, able to design an optimum solution in terms of human, materials and energy resource utilization and take conscious efforts to transfer the essence of the past to the present and the future through his creations.
PEO4	Prepared for continued education in architecture or entry into the architectural field or the building industries.

PROGRAMME OUTCOMES

PO1	Ability to understand and frame the design requirements considering the diverse points of view to reach well-reasoned conclusions based on the relevant criteria and standard.
PO2	Ability to Demonstrate all round skill in design and research.
PO3	Ability to use digital tools to simulate, analyze and convey essential design ideas at each stage of the design process
PO4	Understanding of the architect's responsibility to work in the public interest, conserve heritage aspects and to improve the quality of life for urban built environment.
PO5	Ability to incorporate technological developments in assembly of materials, systems, and components appropriate for a building design.
PO6	Ability to analyze Contemporary Theories and Trends in research and design process.
PO7	Work collaboratively with teams of architects and various interdisciplinary design teams involved in the building industry, incorporating the financial implications, negotiating contracts, selecting service consultants.
PO8	Ability to design sustainable urban built environment to provide healthful environments and reduce the environmental impacts.
PO9	Sensitive enough to strictly adhere to the code of conduct prescribed by the competent authority to practice the profession in the country with respect to building codes and regulations, safety aspects and upheld the value of the profession at its highest.
PO10	Ability to contribute further to society through their design/research/ teaching.

PROGRAMME SPECIFIC OUTCOMES

PSO1 Understand the concept of energy in buildings and the impact of energy crisis in building industry and ability to design energy efficient buildings.

PSO2 Understand the planning aspects from the macro to micro level and ability to develop a planning, urban design proposal.

PSO3 Critically design and develop built environments that are environmentally sustainable, socially inclusive, and climate-responsive, demonstrating advanced integration and application of Sustainable Development Goals in theory and practice

PERIYAR MANIAMMAI INSTITUTE OF SCIENCE & TECHNOLOGY

FACULTY OF ARCHITECTURE AND PLANNING

DEPARTMENT OF ARCHITECTURE

M. Arch General Architecture

CURRICULUM - REGULATIONS 2024

Category of courses and minimum credit requirement according to the CoA Guidelines on Curriculum and Credit Framework for M. Arch degree programme is outlined below:

Sl. No.	Category of Courses	Credits	Weightage
1	Professional Core Courses (PC)	60	66.7%
2	Elective Courses		
	Professional Electives (PE)	12	13.3%
	Online courses	3	3.3%
3	Employability Enhancement Courses (EEC)		
	Employability Enhancement Compulsory Courses (EECC)	5	5.6%
	Skill Enhancement Courses (SEC)	6	6.7%
4	Value added courses	4	4.4%
Total		90	100

SEMESTER I

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1.	P24AR101	Emerging Trends in Housing	3	0	0	3
2.	P24AR102	Sustainable Services in High rise Buildings	3	0	0	3
3.	P24AR9XX	Professional Elective - I	3	0	0	3
Theory Integrated Laboratory						
4.	P24AR103	Digital Design Process	1	0	4	3
Studio						
5.	P24AR104	Architectural Design Studio - I	0	0	9	9
		Total	**10**	**0**	**13**	**21**

SEMESTER II

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1.	P24AR151	Urban Design	3	0	0	3
2.	P24AR152	Architectural Heritage Conservation and Management	3	0	0	3
3.	P24AR9XX	Professional Elective - II	3	0	0	3
Theory Integrated Laboratory						
4.	P24AR153	Geographical Information System	1	0	4	3
Studio						
5.	P24AR154	Architectural Design Studio - II	0	0	9	9
Value Added Course						
6.	P24VA002	Community Engagement and Social Responsibility	1	0	2	2
		Total	**11**	**0**	**15**	**23**

SEMESTER III

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Theory						
1.	P24AR201	Contemporary Theories and Trends	3	0	0	3
2.	P24AR202	Research Methodology	3	0	0	3
3.	P24AR9XX	Professional Elective - III	3	0	0	3
Dissertation						
4.	P24AR203	Dissertation	0	0	6	3
Studio						
5.	P24AR204	Architectural Design Studio - III	0	0	9	9
Internship						
6.	P24AR205	Summer Internship	0	0	0	2
Value Added Course						
7.	P24VA017	Traditional Science and Contemporary systems	2	0	0	2
		Total	**11**	**0**	**15**	**25**

SEMESTER IV

Sl. No.	Course Code	Course Name	Credits			
			L	**T**	**P**	**C**
Theory						
1	P24AR8XX	Online Course	3	0	0	3
2	P24AR9XX	Professional Elective - IV	3	0	0	3
Project						
3	P24AR251	Thesis	0	0	15	15
		Total	**6**	**0**	**15**	**21**

Semester wise Credit Distribution (in all categories of courses)

Sl. No.	Category of Courses	Credits	I	II	III	IV
1	**Professional Core Courses (PC)**	60	15	15	15	15
2	**Elective Courses**					
	Professional Electives (PE)	12	3	3	3	3
	Online courses	**3**	-	-	-	3
3	**Employability Enhancement Courses (EEC)**					
	Employability Enhancement Compulsory Courses (EECC)	5			5	
	Skill Enhancement Courses (SEC)	6	3	3		
4	**Value added courses**	4		2	2	
	Total	**90**	**21**	**23**	**25**	**21**

List of courses under each Category

Professional Core Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	P24AR101	Emerging Trends in Housing	3	0	0	3
2	P24AR102	Sustainable Services in High rise Buildings	3	0	0	3
3	P24AR104	Architectural Design Studio - I	0	0	9	9
4	P24AR151	Urban Design	3	0	0	3
5	P24AR152	Architectural Heritage Conservation and Management	3	0	0	3
6	P24AR154	Architectural Design Studio - II	0	0	9	9
7	P24AR201	Contemporary Theories and Trends	3	0	0	3
8	P24AR202	Research Methodology	3	0	0	3
9	P24AR204	Architectural Design Studio - III	0	0	9	9
10	P24AR251	Thesis	0	0	15	15
		Total	**18**	**0**	**42**	**60**

Professional Elective Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
Professional Elective -I						
1.	P24AR901	AR and VR in Building Design	3	0	0	3
2.	P24AR902	Advanced Materials and Construction Technology	3	0	0	3
3.	P24AR903	Disaster Management	3	0	0	3
Professional Elective -II						
1.	P24AR951	Building Management and Automation Systems	3	0	0	3
2.	P24AR952	Architectural Acoustics	3	0	0	3
3.	P24AR953	Construction Management	3	0	0	3
Professional Elective -III						
1.	P24AR904	Building Information Modelling	3	0	0	3
2.	P24AR905	Lighting and Illumination	3	0	0	3
3.	P24AR906	Interior Design	3	0	0	3
Professional Elective -IV						
1.	P24AR954	Sustainable Habitat Design and Construction	3	0	0	3
2.	P24AR955	Urban Landscape	3	0	0	3
3.	P24AR956	Anthropology and Architecture	3	0	0	3

Online Courses

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1.	P24AR8XX	Online Course	3	0	0	3

Employability Enhancement Compulsory Courses (EECC)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	P24AR203	Dissertation	0	0	6	3
2	P24AR205	Summer Internship	0	0	0	2
		Total	**0**	**0**	**6**	**5**

Skill Enhancement Courses (SEC)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	P24AR103	Digital Design Process	1	0	4	3
2	P24AR153	Geographical Information System	1	0	4	3
		Total	**2**	**0**	**8**	**6**

Value Added Courses (VA)

Sl. No.	Course Code	Course Name	Credits			
			L	T	P	C
1	P24VA002	Community Engagement and Social Responsibility	1	0	2	2
2	P24VA017	Traditional Science and Contemporary systems	2	0	0	2
		Total	**3**	**0**	**2**	**4**

Syllabus
Regulations 2024

Semester I

Course Code	Course Name	L	T	P	C
P24AR101	Emerging Trends in Housing	3	0	0	3
Sustainable Development Goals					

Category: Professional Core Course (PCC)

a. Preamble

This course facilitates the students to understand the redefinition of contemporary housing within the contexts of multicultural cities due to globalization and Role of Government and Public agencies in Housing Development.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Gain Knowledge about the latest development, issues and design strategies governing housing at national and international level.	K2
CO2	Sensitivity to the various forces that shape the form of housing today.	K3
CO3	Understand Indian and global urban housing practices.	K2
CO4	Recognize the role of policies, agencies, schemes and finance models for housing.	K2
CO5	Redefinition of contemporary housing within the contexts of multicultural cities due to globalization.	K3
CO6	Outline of the evolution of housing to its present forms.	K3

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO HOUSING **9**

Housing Scenario in India- Housing Types and Issues: Single Family, Multi Family, High Density, Community Housing- Micro Housing- Affordable Housing- Informal Housing-Socio Cultural and Economic Facets of Housing. Urban and Rural housing Stock: Adequacies and Amenities. Demand and Supply Assessment - Factors of influence - Housing Quality and its Determinants. Market Rate Development and Housing.

EVOLUTION OF HOUSING TRENDS **9**

Industrialization – Modernity - Modularity and Housing - Participatory Housing - Charles Correa's Housing and Urbanization - Affordable Housing Case Studies.

SINGLE FAMILY, MULTI FAMILY HOUSING **10**

Review of Latest Developments in Single Family and Multifamily Housing by Examining the Works of:- Wiel Arets- Shigeru Ban- Ben van Berkel- Kees Christiaanse - Philippe Gazeau- Frank O. Gehry- Steven Holl- Hans Kollhoff- Jean Nouvel.

EMERGING PRACTICES IN URBAN HOUSING **7**

Alternate housing models: Commune, Co-Housing, Cooperatives - Hyper Housing - Multi-cultural Housing - Lab rooms and Cyber homes, Micro housing - Network housing - Hybrid buildings - Individual sheltered residences - Bio homes for Senior citizens.

HOUSING PROGRAMMES AND INSTITUTIONAL FRAMEWORK 10

Role of Government and Public Agencies in Housing Development. National Housing Policy - Five Year Plans and their Impact on Housing - National Schemes: JNNURM- IHSDP- AMRUT - Site and Services Schemes: MUDP I & II - Cooperative Housing - Role of Housing Agencies - Basic Housing Standards and URDPFI Guidelines.

d. Activities

- Create a presentation of various alternate housing models.
- Compare and contrast architectural styles of housing development by various architects.
- Preparing a report of different government policy initiating housing Development.

e. Learning Resources

1. Tighe, Rosie and Mueller. “The Affordable Housing Reader”. Abingdon-On-Thames: Routledge, 2012.
2. Graham Towers. “Introduction to Urban Housing Design”. Abingdon-On-Thames: Routledge, 2005
3. Correa, Charles. “Housing and Urbanization: Building Solutions for People and Cities”. Thames & Hudson, 2003.
4. Carles Bronto. “Innovative Public Housing”. Gingko Press, 2005.
5. Jingmin Zhou. “Urban housing Forms”. Oxford: The Architectural Press, 2005.
6. Manuel Gausa and Jaime Salazer. “Housing+ Single Family Housing”. Basel: Birkhauser Publishers for Architecture, 2005.
7. Rahul Mehrotra, “Architecture in India since 1990”, HatjeCantz, 2011.
8. Adrienne Schmitz, “Multifamily Housing Development Handbook”, Urban Land Institute, 2000.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1		1			2			0		1		2	1
CO2		1			2			2		1		2	1
CO3		1			2			2		1		2	1
CO4		1			2			2		1		2	1
CO5		1			2			2		1		2	1
CO6		1			2			2		1		2	1
Total		6			12			10		6		6	6
Scaled value		1			2			2		1		1	1

Course Code	Course Name	L	T	P	C
P24AR102	Sustainable Services in High Rise Buildings	3	0	0	3
Sustainable Development Goals					

Category: Professional Core Course (PCC)

a. Preamble

This course provides an in-depth understanding of components, technologies of building services in high rise buildings. This course further enlightens the technologies that contribute to the sustainable aspects of building services.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand sustainable building services concepts and their integration in high-rise structures.	K2
CO2	Understand the water management and waste disposal techniques in high rise buildings.	K2
CO3	Analyze the efficiency of HVAC, electrical, and mechanical systems in high-rise buildings.	K4
CO4	Plan vertical transportation systems considering design factors and safety in high-rise buildings.	K6
CO5	Assess fire safety systems for optimal protection and risk mitigation in high-rise structures.	K5
CO6	Understand integrated building automation systems to enhance operational sustainability.	K2

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO SUSTAINABLE SERVICES **5**

General Introduction to Services in both Horizontal spread and Vertical rise layouts- Standards of High-Rise buildings - Aspects and Integration of Services - Relative Costs - Concepts of Intelligence Architecture and Building Automation.

WATER SUPPLY AND WASTE DISPOSAL **10**

Water storage and Distribution systems in High rise buildings - Planning and Design-Selection of pumps, Pressure Release Valves (PRV) and Boosters, Hydraulics in High rise plumbing - Water behavior in stack, ventilation. Solvent system-Aerator and Deaerator, Water Management Systems - Concept of Sustainable Urban Drainage Systems (SUDS) - Sewage Collection Systems, Recycling of Water and Rain Water Harvesting Solid Waste Disposal - Core Configuration in High rise buildings, Recycling Concepts, Management and Integration with Urban level.

HVAC, ELECTRICAL AND MECHANICAL SYSTEMS **10**

HVAC and Mechanical Ventilation systems - outlining of Design Process, Building Organization and Decision making in High rise buildings HVAC - Types of Systems - Direct Refrigerant Systems, all Air Systems, Air and Water systems, all Water Systems, District Heating and Cooling Systems, Mechanical Ventilation Systems. Electrical Management - Load and Distribution- Planning and Design for Energy Efficiency - Automation.

VERTICAL TRANSPORTATION SYSTEMS **10**

Types of Elevators - Based on Operative Mechanism and Functions, MRL, Over Speed Governors, Limitations and Challenges in High Rise Elevator Systems. Twin Lifts, Destination Dispatch System, Intelligence in Elevators. Design Factors in

Planning High Rise Elevator Systems. Planning of Escalators - Components and Safety Principles, Integration with Automation.

SAFETY SYSTEM **10**

Lightening Protection Systems, Techniques in High Rise Buildings. Passive Fire Safety, Fire Lift Concepts, Compartmentalization, Smoke Management - Staircase Pressurization, Evacuation Management, Zonal Evacuation, Means of Egress, Refuge Spaces. Active Fire Safety - Detection and Suppression Systems, Mechanical Systems Pumps, Hydrants, Control Panels and Automation - Planning and Design, Fire Fighting Systems Management - Control Panel Linkage with Fire Detection, Alarm Systems and Communication.

d. Activities

- Prepare a case study report on services of an existing high-rise building.
- Criticize the importance of sustainability in building services of complex buildings typology
- Perform a market study report on selected building service products that contribute to sustainability.

e. Learning Resources

1. Benjamin Stein, et al., “Mechanical and electrical equipment for buildings”,10th edition, John Wiley & Sons, Inc, 2006.
2. George R. Strakosch, Robert S. Caporale, “The Vertical Transportation Handbook”, 4th edition, John Wiley & Sons, Inc, 2010.
3. Mittal, A.K, “Electrical and Mechanical Services in High Rise Buildings: Design and Estimation Manual Including Green Buildings”, 2nd edition, 2015.
4. James M Sinopoli, “Smart Buildings Systems for Architects, Owners and

Builders", Butterworth-Heinemann Ltd,1st edition, 2009.

5. A. Maurice Jones Jr., Jones, "Fire Protection Systems", 2nd edition, Jones & Bartlett Publishers, 2013
6. Das Akhil Kumar, "Principles of fire safety engineering", 2nd edition, 2020.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				2			1				2		1
CO2				3			1		2		2		1
CO3				3			1		2				1
CO4				3			1		2				1
CO5				3			1		2				1
CO6				3			1				2		1
Total				17			6		8		6		6
Scaled value				3			1		2		1		1

Course Code	Course Name	L	T	P	C
P24AR103	Digital Design Process	1	0	4	3
Sustainable Development Goals					

Category: Skill Enhancement Course (SEC)

a. Preamble

This course facilitates the students to understand the theories and process of Contemporary Architecture and the ways of creating digital outputs using computer applications and usage.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the various concepts and theories of digital architecture	K2
CO2	Gain knowledge in Interactive and virtual architecture	K3
CO3	Understand ideas of contemporary digital architects and their design process	K3
CO4	Able to apply the theories and Design using digital media	K6
CO5	Gain knowledge on digital design software and scripting methodologies	K3
CO6	Able to apply the concept of Biomimicry using software	K3

c. Course Syllabus **Total: 75 Hours**

INTRODUCTION **10**

Contemporary Theories in Digital Architecture - Evolution of Digital Architecture – Driving Forces behind Digital Architecture – Digital Output and its Process.

SOLIDS, SURFACES & VIRTUAL MEDIA **16**

Works of Zvihecker – Shape Grammar – Hyper Surfaces – Interactive Architecture – Virtual Architecture - Design Assignment based on the above concepts.

GENETIC ALGORITHM **16**

Fractal theory – Voronoi Patterns – Cellular Automata - Linden Mayor Systems – Basic Concepts and its Application - Design Assignment Based on any of the above Concepts.

IDEAS AND WORKS OF CONTEMPORARY ARCHITECTS **16**

Greg Lynn - Reiser + Umemotto - Lars spuybroek/NOX Architects - UN Studio, Diller Scofidio - Dominique Perrault, Aranda Lasch - Herzog and De Meuron - Neil Denari - Michael Hasmeyer.

BIOMIMICS **17**

Concept of Biomimics - Biomimicry and its Application – Project based on Biomimics – Evolution of Biomimics in Architecture – Design Assignment based on Biomimics (either Digital or Manual) Lab Classes in Scripting and Rhino + Grasshopper.

d. Activities

- Compare and contrast interactive and virtual architecture.
- Criticize various genetic algorithm concepts adopted by contemporary architects.
- Create a digital design Scripting Rhino and Grasshopper.

e. Learning Resources

1. Greg Lyres - “Animate from”.
2. James Gleict – “Chaos making of new science”.
3. Philip Ball – “The self-made taps by: Patters formed in Nahre”.
4. Frei otto and Bodo Rasch – “Finding forms: Tourrds an Architecture of the Minimal”.
5. Douglar R.Hoftstader – “Godel, Escher and Bach: An external Golden Baid”.
6. Staner Johnson – “Emergence”.
7. Patrick Schumacher - “The Autopoiesis of Architecture”.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1			3		1	2							1
CO2	1		2			3					1		1
CO3	1		1			3							1
CO4			3			1					1		1
CO5			2			3							1
CO6			2			3							1
Total	2		13			15					2		6
Scaled value	1		3		1	3					1		1

Course Code	Course Name	L	T	P	C
P24AR104	Architectural Design Studio - I	0	0	9	9
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course equips students to navigate the complexities of contemporary architecture through process-driven design. By engaging with methods like diagramming, mapping, and participatory approaches, students will tackle challenges in projects ranging from campus designs to urban and rural housing. The course emphasizes critical analysis of globalization, legal frameworks, and technological advancements, guiding students to create innovative and contextually appropriate architectural solutions that align with design intent and address human needs.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Analyze and synthesize data to inform architectural design decisions.	K3
CO2	Apply design processes like mapping, diagramming, and participatory methods.	K3
CO3	Evaluate the impact of globalization, legal issues, and policy on development projects.	K5
CO4	Develop innovative solutions for sustainable built environment.	K6
CO5	Critically analyze standards, services, and technological advancements in design.	K3
CO6	Generate contextually appropriate design solutions that align with the intent.	K6

c. Course Syllabus **Total: 135 Hours**

CONTENT **135**

In today's complex world, understanding interconnected layers is essential, particularly as this complexity is reflected in the evolving needs of buildings and the built environment. This studio will focus on design processes that integrate specific inputs and needs into projects, ensuring architecture holistically addresses human needs. Using methods like diagramming, mapping, participatory approaches, collaboration, and data analysis, students will explore macro environments, socio-cultural aspects, user behavior, and more. Projects may include large-scale campus designs, township developments, or urban architectural interventions. Additionally, the studio will address issues in both urban and rural contexts through precedent studies, literature reviews, and case studies. The impact of globalization, real estate development, legal issues, and policy and infrastructure development will be examined. Design problems will encompass both horizontal and vertical development projects, with a critical analysis of standards, services, legal aspects, contemporary principles, and current technological advancements. The focus will be on studying and analyzing situations through appropriate processes, leading to innovative, workable solutions that align with the design intent. In the design stage, the emphasis will be on generating solutions through these processes, ensuring a strong connection between the design intent and the final outcome.

d. Learning Resources

1. John Achim Menges, Sean Ahlquist, Eds, “Computational Design Thinking, AD Reader”, Wiley & Sons, 2011.
2. Robert Woodbury, “Elements of Parametric Design”, 1st Edition, Routledge, 2010.
3. Paul Coates, “Programming Architecture”,1st Edition, Routledge, 2010.

4. Wassim Jabi, Brian Johnson, Robert Woodbury, “Parametric Design for Architecture”, Laurence King Publishing, 2013.
5. Wendy Gunn, Ton Otto, Rachel Charlotte Smith, “Design Anthropology: Theory and Practice”, Berg, 2013.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	2	1	1		1				2		1	2	1
CO2	2	1	1		1				2		1	2	1
CO3	2	1	1		1				2		1	2	1
CO4	2	1	1		1				2		1	2	1
CO5	2	1	1		1				2		1	2	1
CO6	2	1	1		1				2		1	2	1
Total	12	6	6		6				12		6	12	6
Scaled value	2	1	1		1				2		1	2	1

SEMESTER II

Course Code	Course Name	L	T	P	C
P24AR151	Urban Design	3	0	0	3
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course facilitates the students to have an in-depth exploration of urban design theories and contemporary trends. It emphasizes on the historical evolution of urban design, contemporary approaches, and the impact of emerging technologies and sustainability concerns on urban environments by engaging in with both theoretical perspectives and practical case studies.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the historical evolution of urban design by describing classical and medieval urban planning.	K2
CO2	Apply spatial theories of urban design by demonstrating their use in analyzing modern urban environments.	K3
CO3	Compare various urban design methodologies by organizing their effectiveness in addressing traffic and activity patterns.	K2
CO4	Analyze contemporary trends in urban design by examining the impact of AI and climate change on urban planning.	K4
CO5	Evaluate urban renewal strategies by assessing their effectiveness in economic regeneration and infrastructure upgradation.	K5
CO6	Analyze through case study a comprehensive urban design plan to address a specific urban issue.	K4

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO URBAN DESIGN **9**

Urban Design Heritage of the Western World and India - The Roots of our Modern Urban Design and Planning Concepts - Classical and Medieval Urban Design: Greek, Roman, and Medieval Town Planning - Industrial Revolution and Urbanization: The Impact of Industrialization on Urban Form; Garden Cities, and the City Beautiful Movement - 20th Century Theories: Modernism, Le Corbusier's Radiant City, and Jane Jacobs' critiques.

THEORIES OF URBAN DESIGN **9**

Spatial Theories: Kevin Lynch's Imageability, Christopher Alexander's Pattern Language, and Gordon Cullen's Townscape - Social Theories: Theories on Urbanism by Henri Lefebvre, The Public Realm by Richard Sennett, and the Right to the City - Environmental and Ecological Theories: Sustainable Urbanism, Biophilic Cities, Landscape Urbanism. Critical Urban Theory: The Influence of Neoliberalism, and Post-Colonial Critiques.

URBAN DESIGN METHODOLOGIES **9**

Activities of the City, its Traffic Pattern along with Activity Pattern and its Organization Tackling Grey Areas in the City, Tackling the Traffic, Parking and Creating Activity Hubs - Methods of Urban Design Surveys - Documentation and Representation- Cognitive Mapping – Contemporary and Traditional - Architectural Expressions - Case Studies.

URBAN RENEWAL AND DEVELOPMENT **9**

Historic Overview of Urban Renewal, Development Strategies for Regeneration of Inner-city Areas, Recycling, Renewal - Adaptive Reuse and Brown Field Projects in India and Abroad - Infrastructure Up-gradation - Economic Regeneration - Financing and Management of Urban Renewal Schemes - Institutional Framework for Urban Conservation and Renewal Strategies in India.

CONTEMPORARY TRENDS IN URBAN DESIGN **9**

The Role of AI and Machine Learning: Predictive modeling, Autonomous Urban systems, and AI-driven design tools - Climate Change Adaptation: Urban Design responses to Rising Sea levels, Extreme Weather Events, and Resource Scarcity - Changes in Urban Design Thinking and Practice in Response to Global Health crises - Globalization and Urbanization: Impact of Global forces on Local Urban Environments; Mega-cities and Urban Sprawl.

d. Activities

- Present case study report of the non-participatory survey done observing all the urban design theories.
- Journal review of the Research papers done on Contemporary Approach to Urban Design.
- Street study and redevelopment Proposal exercise.

e. Learning Resources

1. Jon Lang, “Urban design” – a typology of procedures & products” Glsevier, North America, 2005.

2. Geoffrey Broadbent, “Emerging concepts in Urban Space Design” Jayker & ravels (1995).

3. Cliff Monghtin, “UD-Street & Square,” Architectural Press (2003).

4. Jonathan Barnett, “Designing cities without designing building”, , Harper & Row, New York (1982).

5. Edmond Bacon, “Design of cities”, revised edition, Viking Penguin Inc; U.S.A (1976).

6. Paul D. Spreiregan AIA, “Urban design: the architecture of town and cities”, Mc Graw-Hill Book Company, New York.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	2			1			2	1		2	1		1
CO2	2			1			2	1		2	1		1
CO3	2			1			2	1		2	1		1
CO4	2			1			2	1		2	1		1
CO5	2			1			2	1		2	1		1
CO6	2			1			2	1		2	1		1
Total	10			6			12	6		12	6		6
Scaled value	2			1			2	1		2	1		1

Course Code	Course Name	L	T	P	C
P24AR152	Architectural Heritage Conservation and Management	3	0	0	3
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course introduces students to the principles and practices of heritage conservation, emphasizing the importance of preserving historic buildings and sites. Through analysis, case studies, and practical applications, students will gain a deep understanding of conservation processes, material preservation, and the creation of effective management plans for heritage properties. It aims to equip students with the knowledge and skills necessary to evaluate and sustain the cultural and historical significance of built environments.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the basics of heritage conservation, including its types, values, and new concepts.	K2
CO2	Analyze heritage buildings by assessing their significance and identifying causes of decay.	K3
CO3	Develop sensitivity and understanding of the architectural conservation process.	K2
CO4	Knowledge of the material aspects of historic buildings and their preservation techniques.	K2
CO5	Critically evaluate a conservation project through cases studies.	K5
CO6	Prepare a detailed report on the heritage buildings and propose appropriate management plans.	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO CONSERVATION **10**

Understanding Heritage: Types, Need, Significance and Values, Debates and Purpose of Heritage Conservation - Defining Conservation, Preservation and Adaptive reuse - Distinction between Architectural and Urban Conservation – Evolution of Conservation - Emerging Concepts.

PROCEDURE FOR CONSERVATION **10**

Listing of monuments / Heritage structures - Assessing Heritage Values and Significance - Degrees of Intervention - Ethics in Conservation - Structural aspects of Heritage buildings - Causes of Decay in Materials and Structure: Natural and Human Factors – Documenting Historic Structures and Heritage Properties - Heritage Site Management - Role of Conservation Architect.

URBAN CONSERVATION **7**

Historic Cities and Heritage Areas – Heritage Regulation - Financial Incentives and Planning Tools such as TDR (Transferable Development Right) - Urban Conservation and Heritage Tourism - Community Participation - Urban Renewal and Recycling - Brown Field Project.

LEGISLATION AND INSTITUTIONS **8**

Institutional Aspects of Conservation - Conservation Charters - Conservation Acts and Legislation – World heritage Sites and Legislation – Archaeological Acts.

CASE STUDIES **10**

Case studies of Conservation Projects - Indian and International Contexts - Appraisal of Projects - Identifying Success or Failure Factors.

d. Activities

- Select a heritage building or precinct, assess its heritage values and significance, document its condition through mapping, identify causes of decay or deterioration, and propose interventions along with a heritage management plan.

e. Learning Resources

1. Pamela Ward, "Conservation and Development in Historic Towns and Cities" - Orid Press. Ltd.
2. Kain Roger, "Planning for Conservation"- St.Martin N-Y 1981.
3. Canni Cutler and Cutter, "Recycling Cities" - Massachussets, 1976.
4. Worsket Roy, "Character of Towns an Approach to Conservation" - Architectural Press, London.
5. "Guidelines for Conservation" by INTACH
6. Sir Bernard M Feilden, "Conservation of Historic buildings" - Architectural Press, 1982.
7. Gerald Glenn, "Presentation & Rehabilitation"- ASTM International (1996).
8. Elsevier Butterworth, "A History of Architectural Conservation" (1'st Pub.1999, Reprint 2005) –Oxford, UK.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1		1		1						1			1
CO2		1		1						1			1
CO3		3		3						3			1
CO4		3		3						3			1
CO5		3		3						3			1
CO6		3		3						3			1
Total		14		14						14			6
Scaled value		3		3						3			1

Course Code	Course Name	L	T	P	C
P24AR153	Geographical Information System	2	0	2	3
Sustainable Development Goal					

Category: Skill Enhancement Course (SEC)

a. Preamble

The course equips the students with the knowledge of a transformative tool that bridges the gap between complex data sets and practical, actionable insights. GIS integrates spatial and non-spatial data, providing a powerful framework for analyzing patterns, relationships, and trends across various geographical contexts. The study of GIS encompasses the collection, management, analysis, and visualization of geographical data.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Grasp basic GIS concepts, software components, and the role of spatial and non-spatial data.	K2
CO2	Navigate and apply commercial and open-source GIS tools for data management and map creation.	K3
CO3	Input and process spatial and attribute data using methods like digitization, georeferencing, and integrating various data sources	K3
CO4	Conduct spatial analyses, create 3D models, and generate maps and reports to support decision-making.	K4
CO5	Model landscapes and urban environments for planning and suitability analysis at different scales.	K5
CO6	Prepare and interpret maps with appropriate formats and projections for specific purposes.	K4

c. Course Syllabus **Total: 60 Hours**

INTRODUCTION TO G.I. S **20**

Introduction to Geographical Information System (GIS) - Defining the Objectives of GIS in Problems Related to the Macro environment - Outline of Commercial and Open source GIS Software and Introduction to Basic components of GIS Software - Outline of Spatial and Non-spatial Data - Understanding of Projection and Coordinate systems - Preparation of Map with Appropriate Format for Specific Purposes.

SPATIAL AND ATTRIBUTE DATA INPUT **20**

Passive and Active Remote Sensing - Image Processing: Spectral Signature Curve, GPS, Aerial Photograph, Satellite Imagery, LIDAR and Drones - Identification of Required Spatial Data layers - Coding Schemes - National Urban Information System - Digitization of Spatial data – Editing: Georeferencing of Satellite Imagery, Cadastral Map, Role of Attribute data in Defining Geographic features - Adding Attribute Data file - Topology generation - Joining Attribute Data to its Geographic features.

SPATIAL ANALYSIS USING GIS **10**

Generation of 3-D Model in GIS - Performing Overlay functions - Manipulating Attribute Data - Preparation of Existing Land Use - Map and Report Generation - Network Analysis.

.

MODELLING THE MACRO ENVIRONMENT **10**

Need for Modelling the Macro Environment for Different Scales and Purposes. Modelling for Suitability, Projects, Situations, Problems in the Realm of Landscape Design, Urban Design, Urban and Environmental Planning.

d. Activities

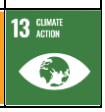
- Create a concept map that illustrates the fundamental concepts of GIS, including key components, types of data, and their relationships. Present your map in a class discussion or online forum.
- Complete a guided tutorial using GIS software to perform basic tasks such as data import, layer management, and map creation. Document your process and outcomes in a report.
- Digitize a set of provided spatial data, georeferenced satellite imagery, and integrate attribute data using GIS software. Create a project showcasing these data layers and provide a brief summary of your data processing steps.

e. Learning Resources

1. Arthur. H. Robinson et al., 'Elements of Cartography', John Wiley & Sons, New York, 1995.
2. Judith. A. Tyner, 'Principles of Map Design', The Guilford Press, New York, 2010.
3. Ramesh Elmasri and Shamkant.B.Navate, 'Fundamentals of Database Systems', Pearson Education Limited, USA, 2010.
4. Anji Reddy.M., 'Text book of Remote Sensing and Geographical Information Systems', B.S. Publications, Hyderabad, 2008.
5. Michael Law and Amy Collins, 'Getting to know ArcGIS Pro', ESRI Press, USA, 2016.
6. Paul. D. Zwick and Margaret.H. Carr, 'Smart Land-use Analysis: The LUCIS Model', ESRI Press, USA, 2007.
7. David Maquire, Michael Batty and Michael F.Goodchild, 'GIS,Spatial Analysis and Modeling', ESRI Press, 2005.
8. Cynthia A. Brewer, 'Designing Better Maps: A Guide for GIS Users' – 2nd Edition, ESRI Press, 2015.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1			2							1		2	1
CO2			2							1		2	1
CO3			2							1		2	1
CO4			3							1		3	1
CO5			3							1		3	1
CO6			3							1		3	1
Total			15							6		15	6
Scaled value			3							1		3	1

Course Code	Course Name	L	T	P	C
P24AR154	Architectural Design Studio - II	0	0	9	9
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course focuses on large-scale architectural design projects that integrate urban design and landscape considerations. Students will explore neighborhood development, urban renewal, and historic precinct conservation, emphasizing the balance between modern needs and heritage preservation.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the principles of urban design, balancing core architectural concepts with emerging technical and planning parameters.	K2
CO2	Critically analyze urban design standards to design buildings that enhance cityscape.	K3
CO3	Evaluate the impact of urban redevelopment on historical and cultural contexts.	K5
CO4	Apply legislation and regulations in the design of inner-city and historic precinct developments, integrating conservation and landscape considerations.	K6
CO5	Apply conservation principles to enhance historic precincts in urban design.	K3
CO6	Integrate landscape design elements into urban design projects, enhancing both functionality and aesthetics.	K6

c. Course Syllabus **Total: 135 Hours**

CONTENT **135**

This course will focus on large-scale architectural design projects that encompass urban design and landscape considerations. Students will engage in a variety of project types, including neighborhood development, redevelopment, and urban renewal initiatives. The course will also cover study, documentation, analysis, and proposal development for inner-city projects, emphasizing historic precincts and their conservation. Landscape design will be integrated into these projects, ensuring that both the natural and built environments are thoughtfully addressed.

Throughout the course, students will work on real-world scenarios that require a deep understanding of urban dynamics, heritage conservation, and the integration of landscape elements into architectural designs. The projects will challenge students to balance modern development needs with the preservation of historical and cultural assets, fostering a comprehensive approach to urban and landscape design.

d. Learning Resources

1. Levine, Karen; Gindroz, Ray, Urban Design Associate, "The urban design handbook techniques and working methods," W.W.Norton, 2003.
2. Jonathan Barnett, "An Introduction to Urban Design," Harper and Row, 1996.
3. Cavallo, R. et al., "New Urban Configurations," IOS Press, 2014.
4. Jan Gehl, "Life Between Buildings: Using Public Space," Arkitektens Forlag, 1987.
5. Donald Watson, "Time-Saver Standards for Urban Design," McGraw Hill, 2005.
6. “Urban Spaces, No. 4”, John Dixon, Visual reference publication, 2006.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	2	1	2		2	1		1	2			2	1
CO2	2	1	2		2	1		1	2			2	1
CO3	2	1	2		2	1		1	2			2	1
CO4	2	1	2		2	1		1	2			2	1
CO5	2	1	2		2	1		1	2			2	1
CO6	2	1	2		2	1		1	2			2	1
Total	12	6	12		12	6		6	12			12	6
Scaled value	2	1	2		2	1		1	2			2	1

Course Code	Course Name	L	T	P	C
P24VA002	Community Engagement and Social Responsibility	1	0	2	2
Sustainable Development Goal					

Category: Value Added Course (VAC)

a. Preamble

This course is designed to explore the dynamic relationship between individuals, organizations, and the communities they serve. This course emphasizes the importance of actively contributing to societal well-being and fostering sustainable, ethical practices. students will not only gain a deeper understanding of the complexities of community engagement but also develop the capacity to drive meaningful, positive change in their professional and personal lives.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Define and explain fundamental concepts related to community engagement and social responsibility, including ethical practices, stakeholder theory, and sustainable development.	K2
CO2	Conduct thorough needs, assessments and stakeholder analyses to identify and understand the diverse perspectives and needs within a community.	K3
CO3	Design and implement effective community engagement strategies that address identified needs and foster meaningful participation from various stakeholders.	K4
CO4	Critically evaluate the effectiveness and impact of social responsibility initiatives, using appropriate metrics and evaluation methods.	K5

CO5	Apply ethical decision-making frameworks to address complex issues related to community engagement and social responsibility, ensuring fairness and integrity in their actions.	K3
CO6	Develop skills to build and maintain collaborative relationships with community organizations, leaders, and other stakeholders, promoting effective partnerships and mutual benefits.	K6

c. Course Syllabus **Total: 45 Hours**

APPRECIATION OF RURAL SOCIETY **10**

Rural life style - Rural society - Caste and Gender relations - Rural Values with respect to Community - Nature and Resources - Elaboration of "soul of India lies in villages' (Gandhi) - Rural infrastructure.

UNDERSTANDING RURAL ECONOMY AND LIVELIHOOD **10**

Agriculture, Farming – Landownership - Water Management - Animal Husbandry - Non-Farm Livelihoods and Artisans - Rural Entrepreneurs - Rural Markets.

RURAL INSTITUTIONS **10**

Traditional Rural Organisations - Self-Help Groups - Panchayati Raj Institutions (Gram Sabha, Gram Panchayat, Standing Committees) - Local Civil Society - Local Administration.

RURAL DEVELOPMENT PROGRAMMES **15**

History Of Rural Development in India - Current National Programmes: Sarva Shiksha Abhiyan, Beti Bachao, Beti Padhao, Ayushman Bharat, Swatchh Bharat, PM Awaasyojana, Skill India, Gram Panchayat Decentralized Planning, NRLM, MNREGA, Etc.

d. Activities

- Visit local Anganwadi Centre and observe the services being provided. Visit local NGOs, civil society organizations and interact with their staff and beneficiaries, Organize awareness programmes, health camps, Disability camps and cleanliness camps.
- Prepare research reports or presentations based on community needs assessments and stakeholder analysis projects.
- Prepare project plans or proposals for community engagement initiatives, including detailed strategies, goals, and implementation steps.

e. Learning resources

1.Singh, Katar, "Rural Development: Principles, Policies and Management", Sage Publications, New Delhi, 2015.

2. A Hand book on Village Panchayat Administration, Rajiv Gandhi Chair for Panchayati Raj Studies, 2002.

3. M.P.Boraian, "Best Practices in Rural Development", Shanlax Publishers, 2016.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				1						1			1
CO2				1						1			1
CO3				1						1			1
CO4				1						1			1
CO5				1						1			1
CO6				1						1			1
Total				6						6			6
Scaled value				1						1			1

SEMESTER III

Course Code	Course Name	L	T	P	C
P24AR201	Contemporary Theories and Trends	3	0	0	3
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course facilitates the students to have an in-depth exploration of ever-evolving realm of architecture, contemporary theories and trends reflect a dynamic interplay between tradition and innovation. And be able to analyze the built environment that continues to transform in response to societal, technological, and environmental changes and be able to push the boundaries of conventional practices.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the key concepts of Postmodernism and its critiques and describing how theories influence architectural practice.	K2
CO2	Apply the principles of Digital Design in Contemporary Architecture	K3
CO3	Compare and contrast different Alternate Practices in Contemporary Architecture	K2
CO4	Analyze the impact of Sustainability in Global Architecture through case studies	K4
CO5	Organize information on Regionalism in Southeast Asia and Translate how regional influences architectural works	K2
CO6	Apply concepts of Postmodern Architecture and integrate methods into a coherent analysis.	K3

c. Course Syllabus **Total: 45 Hours**

POST MODERNISM AND CRITIQUES **9**

Contextualism and Regionalism, High-Tech Architecture, Deconstructivism, Neo-Eclecticism, Populism, Revivalism, New Urbanism, Postmodern Classicism, Structural Expressionism, Metaphorical Architecture - Critiquing Post Modernism with Theories of Robert Venturi, Jane Jacob and Chirstopher Alexander.

ALTERNATE PRACTICES IN CONTEMPORARY ARCHITECTURE **9**

New trends in Architecture Practices Works of Peter Zumtar- Minimalistic Architecture, Conceptual Architecture – Toyo Ito, Adaptive Reuse: Shigro ben-Paper Architecture, Pablo Errazuriz –Container Architecture.

DIGITAL DESIGN IN CONTEMPORARY ARCHITECTURE **9**

Parametric Architecture, Diagrammatic Architecture, Genetic Algorithms, Cellular Automata, Fractals - Use of AR & VR - Computational Architecture - Digital Fabrication - Generative Design and BIM in Contemporary Architecture

REGIONALISM IN SOUTH EAST ASIA **9**

Impact in Post Modernism in Regional Context works of Kengo Kuma, Sou Fujimoto, Kazuyo sejimo, Rafiq Azam, Hafeez contractor, Christopher Benninger, Raj Rewal, Rahul Mehrotra.

THE IMPACT OF SUSTAINABILITY AT THE GLOBAL LEVEL **9**

Principles and Works in Solar Architecture (Ex. William Lumpkins – Balcomb house) Post Modern Green architecture (1980 and after) Eco-Technology: Ex.

Projects of Kenyang, and Norman Foster, Green urbanism: Ex. Foster and Postman Abu Dhabi project.

d. Activities

- Journal review of the Research papers done on Contemporary Design Approaches.
- Decoding and deciphering Architecture styles through Architects works via sketches and sheets

e. Learning Resources

1. Paul Allan Johnson. "Theory of Architecture, Routledge" 2000.
2. Kenneth Frampton. "Modern Architecture since 1900".
3. Michael Hays (ed) "Architectural Theory since 1960", MIT Press, 2000.
4. Bryan Lauson- "How Designers Think", Architectural Press Ltd., London 1980.
5. Tom Health- "Method in Architecture, John Wiley & Sons", New York, 1984.
6. Christopher Alexander, "Pattern Language", Oxford University Press.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1		1				2				1			1
CO2		1				2				1			1
CO3		1				2				1			1
CO4		1				2				1			1
CO5		1				2				1			1
CO6		1				2				1			1
Total		6				12				6			6
Scaled value		1				2				1			1

Course Code	Course Name	L	T	P	C
P24AR202	Research Methodology	3	0	0	3
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course equips students with the essential tools and techniques to conduct rigorous and meaningful research. Understanding research methodology is critical not only for conducting one's own research but also for critically evaluating the work of others. This course will introduce students to both qualitative and quantitative research methods, covering the full research process - from formulating research questions and designing studies to data collection, analysis, and interpretation.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the concepts and Issues in Research through samples	K2
CO2	Understand the research process through Data collection, analysis and frame of questioner.	K2
CO3	Understand the data collection from secondary data using Digital and Manual documentation	K2
CO4	Analyse and interpret the collected data	K4
CO5	Demonstrate the research writing from the samples	K3
CO6	Demonstrate the case study paper writing and presentation	K3

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION **9**

Basic Research Issues and Concepts - Orientation to Research Process - Types of Research: Historical, Qualitative, Co-Relational, Experimental, Simulation and Modeling, logical Argumentation, Case study and Mixed methods - Illustration using Research samples.

RESEARCH PROCESS **9**

Elements of Research Process: Finding a Topic - Writing an Introduction - Stating a Purpose of Study - Identifying Key Research Questions and Hypotheses: Reviewing Literature - Using Theory - Defining, Delimiting and Stating the Significance of the Study, Advanced Methods and Procedures for Data Collection and Analysis - Illustration using Research Samples.

RESEARCHING AND DATA COLLECTION **9**

Library and Archives - Internet: New Information and the Role of Internet; Finding and Evaluating Sources – Misuse - Test For Reliability - Ethics Methods of Data Collection - From Primary Sources: Observation and Recording, Interviews Structured and Unstructured, Questionnaire, Open Ended and Close Ended Questions and the Advantages, Sampling - Problems Encountered in Collecting Data from Secondary Sources.

REPORT WRITING **6**

Research Writing in general - Components: Referencing - Writing the Bibliography - Developing the Outline - Presentation; Book Review Writing, etc.

CASE STUDIES **12**

Case Studies Illustrating how good Research can be used from Project Inception to Completion - Review of Research Publications.

d. Activities

- Prepare a questioner, conduct survey or interview with appropriate people to gain first hand insights and perspectives for research.

e. Learning Resources

1. Chicago," guides to writing, editing and publishing"; 2nd Edition;
2. An Architecture Student's "Iain Borden and Kaaterina Ruedi"; The Dissertation.
3. Handbook; Architectural Press; 2000
4. Ranjith Kumar; "Research Methodology - A step by step guide for beginners"; Sage
5. Publications; 2005
6. John W Creswell; "Research design: Qualitative, Quantitative and Mixed Methods"

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1		3	1		1	3				3			1
CO2		3	1		0	3				3	1		1
CO3		2	1		0	2				2			1
CO4		2	1		1	2				2			1
CO5		3	1		1	3				3	1		1
CO6		2	1		1	2				2			1
Total		15	6		4	15				15	2		6
Scaled value		3	1		1	3				3	1		1

Course Code	Course Name	L	T	P	C
P24AR203	Dissertation	0	0	6	3
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course facilitates students to get exposed to various thrust areas in architecture, inculcates the spirit of research in architecture by providing opportunities to read and write technically thus provides a platform for a prelude to 'Design Thesis'.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Undertake the research systematically in a chosen topic.	K2
CO2	Analyses and interpret the information obtained from the study.	K4
CO3	Organize the collected information graphically	K2
CO4	Understanding leading to formation of thesis ideas	K4
CO5	Write technical report from the collected data and analysis	K6
CO6	Develop the report of the analysed information with the logical reasoning and conclusion.	K4

c. Course Syllabus **Total: 90 Hours**

TOPICS OF STUDY

The main areas of Study and Research can include Advanced Architectural Design, including Contemporary Design Processes, Urban Design, Environmental Design, Conservation and Heritage Precincts, Housing etc - However, the specific thrust should be Architectural Design of Built Environment. Preparation of Presentation drawings and Reports are part of the Requirements for submission.

METHOD OF SUBMISSION

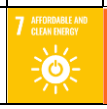
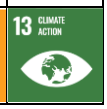
The Dissertation shall be submitted in the form of drawings, project report, CDs and reports.

d. Learning Resources

As per requirement of Topic and as suggested by the supervisor of dissertation,

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1		3		1			1			3			1
CO2		3		1			1			3			1
CO3		3		1			1			3			1
CO4		2		1			1			2			1
CO5		2		1			1			2			1
CO6		2		1			1			2			1
Total		15		6			6			15			6
Scaled value		3		1			1			3			1

Course Code	Course Name	L	T	P	C
P24AR204	Architectural Design Studio - III	0	0	9	9
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This course focuses on the design and development of large-scale architectural projects such as campuses, airports, and mixed-use high-rise developments. Emphasizing the integration of Building Management Systems and detailed building services, the course prepares students to create comprehensive and functional designs that meet both aesthetic and operational demands.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the complexities involved in large-scale architectural projects like campuses, airports, and civic centers.	K2
CO2	Apply advanced design principles to develop detailed proposals for mixed-use high-rise developments.	K3
CO3	Integrate Building Management Systems (BMS) into the design of large-scale projects for efficient operation.	K3
CO4	Analyze and incorporate building services (HVAC, electrical, plumbing, etc.) into detailed design drawings.	K3
CO5	Evaluate the effectiveness of design solutions in addressing both functional and regulatory requirements in urban recreational centers.	K5
CO6	Create comprehensive design proposals that balance architectural innovation with practical service integration.	K6

c. Course Syllabus **Total: 135 Hours**

CONTENT **135**

This course will focus on large-scale architectural projects, including campus designs, airports, civic centers, urban recreational centers, and mixed-use high-rise developments. Students will explore the complexities of designing such expansive and multifunctional spaces, addressing both the macro-scale urban planning aspects and the detailed architectural elements.

A key component of the course will involve the integration of Building Management Systems (BMS) into the design process, ensuring that all projects incorporate advanced technological solutions for efficient operation and sustainability. Detailed design drawings will also emphasize the incorporation of essential building services, including HVAC, electrical systems, plumbing, and fire safety measures, to ensure that the projects are not only aesthetically and functionally sound but also meet all necessary regulatory and safety standards.

Throughout the course, students will develop comprehensive design proposals that balance architectural innovation with practical considerations, preparing them to manage the complexity of large-scale projects effectively. The course will culminate in detailed design submissions that demonstrate the students' ability to integrate all aspects of building services and management systems into their architectural solutions.

d. Learning Resources

1. ASHRAE HANDBOOK 2018.
2. HVAC Design Sourcebook 1st Edition by W. Larsen Angel, 2011.
3. Intelligent Building and Building Automation, The Hong Kong Polytechnic University,1992.
4. B Atkin, Intelligent Building, John Wiley & Sons.G J Levermore, 1988.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	2	2	1	1	1	1		1	2	1		1	1
CO2	2	2	1	1	1	1		1	2	1		1	1
CO3	2	2	1	1	1	1		1	2	1		1	1
CO4	2	2	1	1	1	1		1	2	1		1	1
CO5	2	2	1	1	1	1		1	2	1		1	1
CO6	2	2	1	1	1	1		1	2	1		1	1
Total	12	12	6	6	6	6		6	12	6		6	6
Scaled value	2	2	1	1	1	1		1	2	1		1	1

Course Code	Course Name	L	T	P	C
P24AR205	Summer Internship	0	0	0	2
Sustainable Development Goal					

Category: Skill Enhancement Course (SEC)

a. Preamble

The Internship Training course allows students to apply their architectural knowledge in a real-world setting, focusing on a specialized area of practice or research. This experience will help them develop expertise and prepare for their future thesis or professional career.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Apply architectural knowledge in a real-world professional or research setting.	K3
CO2	Explain the role of specialized areas in architecture within practice or research.	K2
CO3	Analyze processes and practices observed during the internship to identify key expertise.	K3
CO4	Develop expertise in a specific area of architecture through the internship.	K6
CO5	Evaluate the relevance of internship experiences for future thesis work or career goals.	K5
CO6	Synthesize insights from the internship into a comprehensive and reflective report.	K6

c. Course Syllabus **Total: 225 Hours**

CONTENT

Students will participate in a 4-week Internship Training with an architectural office or organization involved in a specialized architectural field. This training aims to provide insights into how specific areas of architecture can be deeply explored within professional practice or research. The internship may take place at an architectural firm, research institution, university, or similar organization focused on such endeavors. Through this experience, students have the opportunity to develop expertise in a particular area of practice or research, and they may also use the training to enhance their readiness for their thesis in the following semester.

The Internship Training is to be completed during the summer break between the second and third semesters, prior to the start of the third semester, with students enrolling in the course at the beginning of the third semester. A detailed Internship Training Report must be submitted by the last working day of the third semester. Evaluation will be based on the submitted report and a Viva-Voce Examination, conducted as part of the End Semester Examinations for the third semester.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	2	3	4	5	6	7	8	9	10	1	2	3
CO1			3	1								1	1
CO2			3	1								1	1
CO3			3	1								1	1
CO4			2	1								1	1
CO5			2	1								1	1
CO6			2	1								1	1
Total			15	6								6	6
Scaled value			3	1								1	1

Course Code	Course Name	L	T	P	C
P24VA017	Traditional Science and Contemporary systems	2	0	0	2
Sustainable Development Goal					

Category: Value Added Course (VAC)

a. Preamble

This course encompasses a rich and diverse tradition of intellectual and cultural wisdom that has evolved over millennia. It includes a vast array of philosophical, scientific, and cultural insights that have shaped not only the Indian subcontinent but also influenced global thought. This course is designed to provide students with a deep understanding of this heritage, exploring its historical roots, philosophical foundations, and contemporary relevance.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Demonstrate a comprehensive understanding of key concepts, texts, and historical developments within Indian knowledge systems, including Vedic literature, classical philosophy, and traditional sciences.	K2
CO2	Critically analyze and interpret important classical texts and philosophical works from Indian traditions, including the Upanishads, Bhagavad Gita, and major philosophical schools such as Vedanta, Samkhya, and Yoga.	K4
CO3	Gain insight into traditional Indian sciences such as Ayurveda, Vastu Shastra, and Jyotisha, understanding their principles, practices, and contributions to health, architecture, and astrology.	K2

CO4	Evaluate the relevance and influence of Indian knowledge systems on modern disciplines and global contexts, including their contributions to science, technology, and cultural practices.	K5
CO5	Apply principles from Indian knowledge systems to address contemporary issues such as sustainability, mental health, and ethical decision-making, demonstrating practical applications of traditional wisdom.	K3
CO6	Develop critical and reflective perspectives on the integration of Indian knowledge systems with other global knowledge traditions, fostering a nuanced understanding of cross-cultural and interdisciplinary approaches.	K6

c. Course Syllabus **Total: 30 Hours**

INTRODUCTION **6**

Overview of Indian Knowledge Systems - Historical development - Major components and contributions - Methodologies in Studying Indian Knowledge Systems - Textual analysis - Oral traditions and historical sources

CLASSICAL TEXTS AND PHILOSOPHICAL TRADITIONS **6**

Vedic Literature and Its Significance - Rigveda, Samaveda, Yajurveda, Atharvaveda - Upanishads and the Concept of Brahman - Major Upanishads and their philosophical insights - Bhagavad Gita and Its Philosophical Teachings - Context, themes, and interpretations - Major Philosophical Schools - Vedanta, Samkhya, Yoga, Nyaya, Vaisheshika

TRADITIONAL SCIENCES AND THEIR APPLICATIONS **6**

Ayurveda: Principles and Practices - Historical development - Key concepts and therapeutic practices - Vastu Shastra: Traditional Architecture - Principles of design and spatial organization - Jyotisha: Traditional Astrology - Basic principles and

applications - Traditional Indian Mathematics and Astronomy - Contributions and techniques

INDIAN KNOWLEDGE SYSTEMS IN CONTEMPORARY CONTEXTS 6

Indian Knowledge Systems and Modern Science - Comparative analysis with contemporary scientific approaches - Applications of Traditional Wisdom in Health and Sustainability - Integrating Ayurveda and modern health practices - Sustainable practices and environmental wisdom - Cross-Cultural Perspectives and Global Influence - influence of Indian Knowledge Systems on global thought and practice

CRITICAL AND REFLECTIVE PERSPECTIVES 6

Interdisciplinary Approaches to Indian Knowledge Systems - Integration with other cultural and intellectual traditions - Contemporary Issues and Indian Knowledge Systems - Addressing global challenges with traditional wisdom - Student Presentations and Course Review - Presentations of final projects - Review and reflection on key learnings

d. Activities

- Prepare a report by analyzing case studies on the application and impact of traditional sciences in contemporary contexts.
- Comparative analysis or interdisciplinary projects that connect traditional Indian knowledge with modern fields.

e. Learning resources

1. Kapil Kapoor, "Indian Knowledge Systems".
2. Bharati Krishna Tirthaji , "Vedic Mathematics".
3. Dominik Wujastyk , "The Roots of Ayurveda: Selections from Sanskrit Medical Writings".

4. Vanamali, "The Science of the Rishis: The Spiritual and Material Discoveries of Ancient India".by Raimon Panikkar, "The Vedic Experience: Mantramañjari".

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				1						1			1
CO2				1						1			1
CO3				1						1			1
CO4				1						1			1
CO5				1						1			1
CO6				1						1			1
Total				6						6			6
Scaled value				1						1			1

Course Code	Course Name	L	T	P	C
P24AR251	Thesis	0	0	15	15
Sustainable Development Goal					

Category: Professional Core Course (PCC)

a. Preamble

This thesis course is the culmination of students' architectural education, allowing them to apply and integrate what they've learned into a comprehensive project. Whether through design or research, students will explore complex architectural issues and create a project that could lead to professional practice or further research. The course ends with a final presentation and exam, showcasing their work and findings.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Apply key concepts to independently formulate a design project at both building and urban levels.	K3
CO2	Explain the integration of research findings, design interventions, and project requirements within the design process.	K2
CO3	Determine project requirements using research methodologies and integrate contemporary techniques into the thesis.	K3
CO4	Analyze case studies and architectural aspects to identify and address issues in the chosen area of interest.	K3
CO5	Evaluate the feasibility and impact of design interventions at both the building and urban scales.	K5
CO6	Synthesize advanced techniques and deep exploration of architectural aspects into a comprehensive thesis.	K6

c. Course Syllabus **Total: 225 Hours**

TOPICS OF STUDY **225**

The thesis is an independent project where students synthesize the knowledge, skills, and techniques acquired in previous semesters. It may be a design-focused thesis with a strong research component or a research-based thesis, with the project scale ranging from individual sites to settlements. Students can build on previous research or explore new areas of design or inquiry, with the final output demonstrating significant research, study, or advanced practice. The thesis should have the potential to serve as a foundation for architectural practice, consultancy, or further research, distinguishing it from a bachelor's thesis. Students must submit a Thesis Proposal for approval before the semester begins, and the progress will be reviewed regularly. Tutorials will guide them in design development, research methodologies, and case study analysis. The final submission will include study sheets, models, design approaches, detailed drawings, a project report, and a soft copy of all work, culminating in a viva voce exam.

d. Learning Resources

As per requirement of Topic and as suggested by the supervisor of Thesis

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	2	2	1		1	1			2	1		1	1
CO2	2	2	1		1	1			2	1		1	1
CO3	2	2	1		1	1			2	1		1	1
CO4	2	2	1		1	1			2	1		1	1
CO5	2	2	1		1	1			2	1		1	1
CO6	2	2	1		1	1			2	1		1	1
Total	12	12	6		6	6			12	6		6	6
Scaled value	2	2	1		1	1			2	1		1	1

PROFESSIONAL ELECTIVES

Course Code	Course Name	L	T	P	C
P24AR901	AR and VR in Building Design	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course explores the integration of Augmented Reality (AR) and Virtual Reality (VR) in building design and architecture. Students will learn how to use these technologies to create immersive environments, visualize architectural projects, and enhance the design process. The course covers both theoretical aspects and practical applications, providing hands-on experience with AR/VR tools and techniques used in the industry.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Describe the fundamentals of AR and VR technologies in architecture and their historical evolution.	K2
CO2	Apply AR/VR tools to create immersive virtual environments for building design projects.	K3
CO3	Analyze the effectiveness of AR applications in construction management and on-site visualization.	K4
CO4	Evaluate user experience design principles in AR/VR interfaces for architectural applications.	K5
CO5	Create integrated workflows for converting CAD/BIM models into AR/VR platforms for enhanced design communication.	K6
CO6	Develop future-ready architectural solutions by combining AR, VR, and MR technologies.	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO AR AND VR IN ARCHITECTURE **5**

Overview of AR and VR Technologies - History and Evolution of AR/VR in Building design - Fundamentals of AR and VR Technologies - Understanding hardware: VR headsets, AR glasses, motion sensors, etc, Software tools and Platforms for AR/VR (e.g., Unity, Unreal Engine, ARKit, ARCore) - Basics of 3D modeling for AR/VR - Current trends and Future possibilities.

APPLICATION OF VR AND AR **12**

VR for Building Design and Visualization - Creating Virtual Environments for Architectural projects - Techniques for Modeling and Rendering in VR - Case studies: VR in Architectural practice - AR in Construction and On-site Visualization - AR Applications in Construction Management and Site inspections - Overlaying Digital Models on Physical Spaces using AR - Real-time Collaboration using AR tools - User Experience (UX) Design for AR/VR in Architecture - Principles of UX design in immersive environments - Designing Intuitive and User-friendly AR/VR Interfaces - Testing and Evaluating user experiences.

WORKFLOW INTEGRATION AND DESIGN COMMUNICATION **12**

Converting CAD/BIM Models for use in AR/VR Platforms - Best practices for maintaining Data Integrity and Accuracy - Workflow Automation and Optimization techniques - AR/VR in Design Presentation and Client Communication - Enhancing Client presentations with Immersive experiences - Techniques for creating Interactive Walkthroughs, Case studies: Successful use of AR/VR in Client presentations.

COLLABORATIVE DESIGN USING AR/VR AND ETHICS **10**

Virtual Collaboration tools for Architects and Engineers - Remote collaboration and Design review using VR - Enhancing Teamwork and Communication through Immersive technologies - Ethical and Practical Considerations in AR/VR - Privacy, Security, and Data protection in AR/VR Environments, Accessibility considerations for Immersive experiences - Legal and Ethical implications of using AR/VR in Architecture

FUTURE OF AR/VR: MIXED REALITY AND BEYOND **6**

Introduction to Mixed Reality (MR) and its Applications in Architecture - Combining AR, VR, and MR in Design workflows, Future trends: Holography, Spatial computing, and AI Integration.

d. Activities

- Perform case studies of AR and VR application in Architectural design and construction.
- Analyse and criticize the application of AR and VR in construction Industry.
- Practice exercise on converting BIM models to AR/VR platforms.

e. Learning Resources

1. Steven M. LaValle, "Virtual reality", Cambridge university press, 2019.
2. Elisangela Vilar, Ernesto Filgueiras, Francisco Rebelo, "Virtual and Augmented Reality for Architecture and Design", CRC Press, 1st edition, 2022.
3. Sara Eloy, Anette Kreutzberg, Ioanna Symeonidou, "Virtual Aesthetics in Architecture: Designing in Mixed Realities", Routledge, 2022.
4. Kelly, G., Graham, J., Bronfman, J., & Garton, S., "Privacy of Virtual Reality: Our Future in the Metaverse and Beyond", San Francisco, CA: Common Sense Media., 2022
5. Ajit Singh, "Virtual Reality: Human Computer Interaction", 2019.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1			2		2					2			1
CO2			2		2					2			1
CO3			2		2					2			1
CO4			2		2					2			1
CO5			2		2					2			1
CO6			3		3					3			1
Total			13		13					13			6
Scaled value			3		3					3			1

Course Code	Course Name	L	T	P	C
P24AR902	Advanced Materials and Construction Technology	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course facilitates the students to learn advanced materials and construction technology suitable for planning and construction.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the various modern materials and its application	K2
CO2	Demonstrate the knowledge on structural systems in tall buildings and other advanced structures	K4
CO3	Explore various advanced construction methods	K4
CO4	Learn the techniques of Prefab and precast construction and modular coordination	K2
CO5	Work with various safety practices adopted in construction sites	K3
CO6	Analyze the case study examples of a tall building with respect to its structural systems and service core.	K4

c. Course Syllabus **Total: 45 Hours**

MODERN MATERIALS **6**

Modern materials in usage like Dry Wall Applications, Sandwiched Wall panels, Materials using Industrial wastes, Polymer based materials, Wooden Composite, FRP, FRC, etc, Modern Cladding materials like High performance Laminates, Zinc, Copper composite panels; Nano Materials and Smart materials in Architectural applications.

ADVANCE CONTRUCTION METHODS **12**

Tall Buildings Structural Systems – Rigid frames – Braced frames – Shear wall – Buildings Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Types: Single, Double and Multilayered Grids, Two way and Three-way Space Grids, Connectors, Grids – Domes - Various forms - Examples of Tensile Membrane Structures – Types of Pneumatic Structures - Definition, Replicating Natural manufacturing methods as in the Production of chemical compounds by plants and animals; Glass theory, Aerodynamic structures etc.

PREFABRICATION AND CONTRUCTION TECHNOLOGY **12**

Modular Co-ordination, Standardization and Tolerances - System of Prefabrication - Pre-cast concrete Manufacturing techniques, Moulds – Construction design, Maintenance and repair - Pre-casting techniques - Planning, Analysis and Design considerations - Handling techniques -Transportation Storage and Erection of structures - Joints - Curing techniques including Accelerated curing such as Steam curing, Hot air blowing etc., - Test on Precast elements - Skeletal and Large panel constructions - Industrial structures - Pre-cast and Pre-fabricating technology for Low cost and Mass housing schemes - Portable architecture, Case study examples.

SAFETY PRACTICES IN CONSTRUCTION **6**

Construction accidents - Construction Safety Management: - Environmental issues in construction - Occupational and Safety hazard assessment - Safety Programmes – Job - Site assessment - Safety in hand tools- Safety in grinding - Hoisting apparatus and Conveyors - Safety in the use of Mobile cranes - Manual handling - Demolition techniques - Safety in demolition work - Trusses, Girders and Beams - First- aid - Fire hazards and preventing methods - Interesting experiences at the Construction site against the Fire accidents - Earthquake Resistant design of buildings.

CASE STUDIES FROM THE CONTEMPORARY SCENARIO **9**

Case study analysis of a Tall building with respect to their Structural systems, Services and Construction methods.

d. Activities

- Analyse a tall structure with respect to the type of foundation, its structural system, and service core.
- Research various prefabrication methods (modular, panelized, hybrid). Create a presentation that outlines the advantages, disadvantages, and applications of each technique. Include case studies and examples of real-world projects.

e. Learning Resources

1. Andrew Charleson; “Structure as Architecture”; Routledge.
2. Hand Book on Construction Safety Practices, SP 70, BIS 2001.
3. N.D.Kaushika, “Energy, Ecology and Environment”, Capital Publishing Company, New Delhi.
4. John Fernandez, “Material Architecture”, Architectural Press, UK.
5. Rodney Howes, “Infrastructure for the built environment”, Butterworth

Heineman.

6. Peurifoy,R.L,Ledbette.W.B., “Construction Planning, Equipment and Methods”, McGraw Hill.
7. CBRI, Building materials and components, India, 1990
8. Gerostiza C.Z., Hendrikson C. and Rehat D.R.," Knowledge based process planning for construction and manufacturing", Academic Press Inc., 1994
9. Koncz T, "Manual of precast concrete construction", Vol.I, II and III, Bauverlag, GMBH,1976
10. Pier Luigi Nervi, General Editor, “History of World Architecture” - Series, Harry N. Abrams, Inc. Pub., New York, 1972.
11. "Structural design manual", Precast concrete connection details, Society for the studies in the use of precast concrete, Netherland Betor Verlag, 2009.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1					2			1			1		1
CO2					2			1			1		1
CO3					2			1			1		1
CO4					2			1			1		1
CO5					2			1			1		1
CO6					2			1			1		1
Total					12			6			6		6
Scaled value					2			1			1		1

Course Code	Course Name	L	T	P	C
P24AR903	Disaster Management	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course facilitates the students to explore into the strategies and practices that safeguard communities from the impacts of natural and man-made disasters. This course is designed to equip you with the knowledge and skills necessary to prepare for, respond to, and recover from a range of disaster scenarios**.** They will examine real-world case studies to understand how various disasters affect communities and the systems put in place to mitigate their impact.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Ability to summarize basics of disaster.	K2
CO2	Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response	K3
CO3	Ability to illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives	K3
CO4	Ability to describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations	K3
CO5	Ability to develop the strengths and weaknesses of disaster management approaches	K3
CO6	Address challenges and innovate new techniques in the rehabilitation process	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION **6**

Disaster: Definition, Factors and Significance - Difference between Hazard And Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

REPERCUSSIONS OF DISASTERS AND HAZARDS **9**

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts.

DISASTER PRONE AREAS IN INDIA **10**

Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference io Tsunami; Post-Disaster Diseases and Epidemics.

DISASTER PREPAREDNESS AND MANAGEMENT **10**

Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness.

RISK ASSESSMENT **10**

Designing and detailing prefabricated units - Industrial structures - Multistorey buildings - Water Tanks – Silos - Bunkers - Application of Pre-stressed concrete in prefabrication.

d. Activities

- Prepare a report summarizing your response plan, execution, and debriefing outcomes. Include any recommendations for future improvements. Present your findings to the class, highlighting key takeaways and best practices.

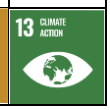
- Develop a comprehensive disaster response plan based on the given scenario.

e. Learning Resources

1. Goel S. L., "Disaster Administration and Management Text and Case Studies", Deep & Deep Publication Pvt. Ltd., New Delhi,2009.
2. Nishitha Rai, Singh AK, "Disaster Management in India: Perspectives, issues and strategies" New Royal book Company,2007.
3. Sahni, Pardeep Et. Al., "Disaster Mitigation Experiences and Reflections", Prentice Hall of India, New Delhi,2001.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				1			1			1			1
CO2				1			1			1			1
CO3				1			1			1			1
CO4				1			1			1			1
CO5				1			1			1			1
CO6				1			1			1			1
Total				6			6			6			6
Scaled value				1			1			1			1

Course Code	Course Name	L	T	P	C
P24AR951	Building Management and Automation Systems	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course provides an in-depth understanding of Building Management Systems (BMS) and automation technologies used in modern buildings. It covers the integration of various building systems such as HVAC, lighting, security, and energy management into a unified control system. The course emphasizes the design, implementation, and management of these systems to enhance building performance, energy efficiency, and occupant comfort.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Describe the fundamentals of Building Management Systems (BMS) and their role in modern building operations.	K2
CO2	Understand digital control systems and sensors in automating building management functions.	K2
CO3	Analyze the integration of HVAC, lighting, and security systems with BMS for energy efficiency and safety.	K4
CO4	Evaluate the use of communication protocols and IoT technologies in enhancing building automation systems.	K5
CO5	Create integrated management solutions for smart buildings utilizing BMS and IoT technologies.	K6
CO6	Develop strategies for implementing smart urban management systems leveraging BMS, IoT, and smart city concepts.	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION **5**

Overview of BMS and its role in Building Operations, History and Evolution of building automation - Introduction to Basics of Building Management Systems (BMS), Integrated Building Management Systems (IBMS) and Building Automation System (BAS) - Scope and Importance of Building Management Systems - Introduction to Facilities Management (FM) Building Information Modeling (BIM) - Management Information systems (MIS) - Internet of things (IoT) and Big data.

DIGITAL CONTROLLERS, SENSORS AND ACTUATORS IN BUILDING AUTOMATION **10**

Data forms, Microcomputers, Memory, processors, Input unit and output unit - Analog and Digital - Types of Sensors used in BMS (temperature, humidity, occupancy, etc.) - Actuators and their role in controlling building systems,

Digital Control Systems (DCS) - Direct Digital Control, SCADA, PLC, Terminal controls and PID Sensors and Actuators - Types and functions - Pneumatic Control systems, Electric Control Systems.

Communication Protocols - Occupancy, Open protocols Vs Proprietary systems, BACnet, LonWorks, Modbus, PROFIBUS and EIB/KNX, XML, SOAP - Building Automation Software and Interfaces, System Integration and Interoperability - Fully Integrated system Vs Standalone operations.

Internet Protocols –WAN, TCP, UDP, IP, LAN, WAN, convergence networks and total integration based on IP.

SERVICE ASPECTS OF BUILDING MANAGEMENT SYSTEM **12**

HVAC Control Systems - Fundamentals of HVAC systems in building - Central plant control and optimization, Sequencing of Chillers, Cooling towers, Control of

CAV, VAV, AHU, Ventilation systems - Integration of HVAC with BMS, Techniques for optimizing HVAC performance and Energy efficiency

Lighting Control Systems - Lighting Automation and Control strategies, Components of Lighting control systems, Standalone lighting control protocols, Digital Addressable Lighting Interface (DALI) - Integration of daylight harvesting and Occupancy sensors, Energy-saving techniques in lighting systems

Security and Access Control Systems - Overview of building Security systems, Integration of Access control, Surveillance, and Alarm systems with BMS, Role of BMS in ensuring building security and safety

Energy Management Systems - Importance of energy management in modern buildings, Integration of Renewable energy sources with BMS - Energy Management and Control Systems (EMCS), Building Energy Management systems (BEMS), BMS Techniques for monitoring and controlling energy usage, towards energy efficiency, sustainability and green practices.

Plumbing - Integration of services – Water pump monitoring and control.

SECURITY SYSTEMS AND INTEGRATION OF SYSTEMS 8

Overview of building security systems, Role of BMS in ensuring building security and safety, Integration of Access control, Surveillance, and alarm systems - Intruder Alarm, Perimeter protection systems with BMS - Integration of Systems - IBMS, Safety and Security systems management, Innovative integration concepts, Cybersecurity in Building Management Systems

SMART BUILDINGS SMART URBAN MANAGEMENT AND IOT INTEGRATION 10

Introduction to Smart buildings and Internet of Things (IoT), Role of IoT in enhancing building automation, BMS Future cities, Intelligent/Smart cities, Smart grids, Demand driven distribution, District cooling and Heating, Wireless Building Technology, Intelligent wireless street lighting system, Intelligent Traffic

Management systems, Intelligent guidance systems. Case studies of smart building and smart city projects.

d. Activities

- Perform a market study report on products from BMS vendors and explain their applications in building automation.
- Criticize the application of BMS by case studies of Intelligent buildings
- Prepare a conceptual framework on application of BMS components for a building typology.

e. Learning Resources

1. Shengwei wang, "Intelligent Buildings and Building Automation", Spon press, 1st edition, 2010.
2. James M Sinopoli, "Smart Buildings Systems for Architects, Owners and Builders", Butterworth-Heinemann Ltd,1st edition, 2009
3. National Joint Apprenticeship & Training Committee, "Building Automation: Control Devices and Applications", American Technical Publishers, 1st edition, 2008.
4. National Joint Apprenticeship & Training Committee, "Building Automation System Integration with Open Protocols", American Technical Publishers, 1st edition, 2008.
5. Benjamin Stein, et al., "Mechanical and electrical equipment for buildings",10th edition, John Wiley & Sons, Inc, 2006.
6. Vivian Capel, "Security Systems and Intruder Alarms", 2nd edition, 1999.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1			2				1				2	1	1
CO2			3				1				2	2	1
CO3			3				1					3	1
CO4			3				1					2	1
CO5			3				1					2	1
CO6			2				1				2	2	1
Total			16				6				6	12	6
Scaled value			3				2				2	3	1

Course Code	Course Name	L	T	P	C
P24AR952	Architectural Acoustics	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course explores the advanced principles and applications of architectural acoustics. It covers the science of sound behaviour in built environments, design strategies for controlling sound quality, and techniques for sound isolation. Students will gain a deep understanding of acoustic theory and its practical application in designing buildings for optimal acoustic performance, such as concert halls, theaters, recording studios, and other specialized spaces.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Describe the fundamental principles of acoustics and their importance in architectural design	K2
CO2	Apply techniques to control sound propagation and absorption in various architectural spaces.	K3
CO3	Analyze the effectiveness of acoustic design strategies in reducing noise and enhancing sound quality.	K4
CO4	Evaluate the performance of different acoustic materials and construction techniques in architectural applications	K5
CO5	Develop acoustic designs for specialized environments, considering both functional and aesthetic requirements	K6
CO6	Create simulation models to predict and optimize the acoustic performance of architectural spaces.	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO ARCHITECTURAL ACOUSTICS **5**

Basic Acoustic principles, History of Acoustics, Importance of acoustics in Architecture.

BEHAVIOUR OF SOUND **10**

Sound Propagation and Absorption - Sound wave Behavior in enclosed spaces, Sound Absorption coefficients of materials, Techniques for controlling Reverberation time - Sound Isolation and Noise Control - Principles of Sound transmission and Isolation - Design strategies for minimizing Noise transmission between space, Techniques for Reducing Environmental noise impact - Room Acoustics and Sound Diffusion - Room acoustic parameters (e.g., Clarity, Definition, Lateral energy fraction), Techniques for achieving Sound diffusion, Designing for balanced sound distribution.

ACOUSTIC DESIGN OF ENCLOSED SPACES **10**

Design principles for optimal acoustics in Concert halls, Theaters, and Lecture rooms - Case studies of Famous acoustic spaces, Simulation techniques for Predicting acoustic performance - Advanced Acoustic Materials and Construction Techniques - High-performance Acoustic materials and their Properties, Construction techniques for Sound control, Integration of Acoustic design in Sustainable architecture.

ACOUSTIC PERFORMANCE AND COMPUTATION **10**

Measurement and Evaluation of Acoustic Performance - Acoustic measurement techniques (e.g., RT60, STI, NC, etc.) - Tools and equipment for Acoustic measurements, Interpreting and applying measurement results in Design. Computational Acoustic Modeling and Simulation - Introduction to Acoustic

Simulation software (e.g., Odeon, EASE), Techniques for Modeling sound behavior in Architectural spaces - Practical applications of Simulation in design projects.

ACOUSTIC DESIGN FOR SPECIALIZED ENVIRONMENTS 10

Specialized acoustic requirements for Recording and Broadcast studios, Design of Control rooms and Performance spaces - Case studies of Studio designs, Acoustic challenges in Healthcare facilities, Educational buildings, and Open-plan offices, Designing for speech intelligibility and privacy, Case studies of specialized acoustic environments - Psycho-acoustics and Human Perception of Sound - Principles of Psycho-acoustics - Influence of Sound on human perception and behavior - Designing spaces that enhance Auditory experiences.

d. Activities

- Compare and present the acoustical properties of various available materials in the market
- Use acoustical equipment and measure the parameters in various environments
- Perform Case studies of specialized acoustic environments

e. Learning Resources

1. Rüdiger Ganslandt, Harald Hofmann, “Handbook of Lighting Design”, 1st edition, ERCO, 1999.
2. Yoichi Ando, “Architectural Acoustics: Blending Sound Sources Sound Fields And Listeners”, 1st edition, Springer, 2020.
3. Raj Patel, “Architectural Acoustics: A guide to integrated thinking”, 1st Edition, RIBA, 2020.
4. William J. Cavanaugh, Joseph A. Wilkes, “Architectural Acoustics: Principles and Practice”, 1st edition, John Wiley & Sons, 1999.

5. Samuel Mills, “Fundamentals of Architectural Lighting: Graphic Guidelines for the Design of Architectural Interior Lighting”, 1st edition, Routledge, 2018.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1					2		1						1
CO2					3		1						1
CO3					3		1						1
CO4					3		1						1
CO5					3		1						1
CO6										3			1
Total					14		5			3			6
Scaled value					3		1			1			1

Course Code	Course Name	L	T	P	C
P24AR953	Construction Management	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

The course equips the students with the fundamental principles and practical skills necessary to manage construction projects of various scales and complexities. They learn methodologies that are integral to managing today's construction projects efficiently and sustainably.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Develop detailed project plans and schedules using industry-standard tools, ensuring timely project delivery	K2
CO2	Effectively manage labor, materials, and equipment, optimizing productivity and minimizing waste.	K3
CO3	Identify potential project risks, assess impacts, and implement strategies to mitigate disruptions	K2
CO4	Apply quality control measures to ensure construction projects meet or exceed required standards	K2
CO5	Strengthen leadership and communication skills to lead teams and collaborate effectively in construction projects.	K5
CO6	Able to accurately estimate costs and prepare budgets, ensuring financial performance is monitored to maintain project budget adherence	K6

c. Course Syllabus **Total: 45 Hours**

CONSTRUCTION MANAGEMENT FRAMEWORK **10**

Construction Landmarks - Scope of Construction Management - Construction Project Characteristics - Construction Project Life Cycle Phases - Construction Project Management - Relation between Client, Consultant and Contractor - Construction Planning - Steps and Stages of Planning - Planning by Contractor and Clients in Different Stages - Preparing Schedule - Time Cost Trade Off.

PLANNING CONSTRUCTION MATERIAL AND EQUIPMENT **10**

ABC Classification of Construction Materials - Material Wastage Standards - Material Provisioning Process Material Inventory Basics - Inventory Planning Process - Application of Value Engineering in the Procurement of Materials. Advantages and Disadvantages of using Equipment's - Equipment's for Excavation, Transporting and Compaction; Aggregate Production and Handling; Concrete Construction; Cranes for Lifting; Tunnel Construction; Highway and Pavement Construction; Hydraulic Structure Construction - Selection of Appropriate Equipment.

CONTROLLING PROJECT INTEGRATION AND WORK **7**

Work Scope Control - Product Quality Control - Labor Productivity Control - Equipment Productivity Control - Material Productivity Control - Work Schedule Control - Performance Control Using Earned Value Analysis.

.

SITE MANAGEMENT AND PROJECT MAINTENANCE **8**

Responsibility of Site Engineer - Supervising Work of Contractor - Record Keeping - Site Order Book - Procedures to Prepare Bills-Measurement Book - Muster Roll - Maintenance Basics - Types of Maintenance - Planning and Scheduling of

Maintenance - Estimating Maintenance Cost - Management of Maintenance and Financing.

Regulatory Requirements **10**

Safety Requirements - Workman's compensation board - Fire regulations and Insurance - Environment concern and protection - Building codes and quality control.

d. Activities

1. Analyze real-world case studies of successful and failed projects, identifying key factors that influenced their outcomes.
2. Develop a detailed project plan for a hypothetical or real project, including scope, schedule, resources, and budget.
3. Conduct a mock quality audit on a project, evaluating processes and outcomes against predefined standards.

e. Learning Resources

1. Chitkara, K. K, "Construction Project Management"; McGraw Hill. 2009.

2. Gupta, B.L, Gupta, Amit; "Construction Management and Machinary" Standard Publishers Distributors, 2010.

3. Peurifoy, R L. "Construction Planning, Equipment and Methods", McGraw Hill 2010.

4. Harris, Frank, "Construction Plant Excavating and Materials handling equipment and Methods", Granada Publishing, London, 1981.

5. Adhikari, R. P., "Construction Management",2020.

6. G S Birdie, "Estimating, Valuation and Specifications" 2006.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				1			1		2				1
CO2				1			1		2				1
CO3				1			1		2				1
CO4				1			1		2				1
CO5				1			1		2				1
CO6				1			1		2				1
Total				6			6		12				6
Scaled value				1			1		2				1

Course Code	Course Name	L	T	P	C
P24AR904	Building Information Modelling	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course will equip students with skills and information to build a comprehensive Building Information Models (BIM) for stage wise project analysis and

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Gain knowledge on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction and operations	K2
CO2	Review and optimise the complex details in the design solution so as to avoid construction risks	K3
CO3	Gain knowledge of optimization, working on options and alternatives that could result in efficiency.	K2
CO4	Use BIM for analyzing energy performance and simulating details	K4
CO5	Understand how to synchronise the real time project through simulation	K2
CO6	Understand the complex details of generating detailed estimates that add to value engineering	K2
K1- Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create		

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO THE FUNDAMENTALS **10**

Key concepts of BIM - Reading and manipulating the Software Interface - Navigating within views - Selection methods - The importance of Levels and Grids- creating Walls, Doors, Windows, and Components - Working with essential Modification commands and Load family - Creating Floors, Ceilings, and Stairs - Working with Type and instance parameters - Importing CAD drawings - Understanding the project browser and Type properties palettes - Adding sheets - Inserting views onto sheets - Adding dimensions and text to the Mode and Plotting.

ADVANCED MODELING – FAMILY TYPES AND TOPOSURFACE MODELLING **10**

Creating curtain walls, Schedules, Details, a Custom family, and Family types - “Flex” a family with family types and work with Reference planes - Creating rooms and an Area plan - Tag components - Customize existing Wall styles - Create and edit a Topo surface, Add Site and Parking components - Draw label contours - Work with phasing - Understand groups and links - Work with stacked walls - Learn the basics of rendering and create a project template.

RENDERING AND MATERIAL APPLICATION **10**

Choosing material for buildings - Creating Custom walls, Floors, and Roofs - Keynoting - Working with Mass elements - Enhancing Rendering with lighting - Producing customized materials - Using Sun and Shadow settings - Walkthrough technique - Adding Decals - Working with Design options and Work sets - Calculating Energy analysis - Managing revisions.

BIM FOR BUILDING ENERGY SIMULATION **10**

Energy simulation for conceptual BIM models using massing - Detailed Modeling using Design elements - Rapid Energy Modeling and Simulation - Conceptual Energy Analysis features to simulate Performance to Produce Energy consumption, Carbon neutrality and Renewable Potential Reports.

BIM FOR COST ESTIMATING, PROJECT PHASING AND ADMINISTRATION **5**

Introduction and theoretical information on the following topics - Model based Cost Estimating - Challenges in Cost estimating with BIM- CAD geometrics vs BIM Element description - Visual Data models - Material substitutions and Value engineering - Detailed estimates and Take off sheets - XML and Automated cost estimate - Project phasing and Management - 4D modeling - BIM for project lifecycles.

d. Activities

- Review and optimize the complex details in the design solution.
- Analyze and iterate on parameters that impact design options.

e. Learning Resources

1. Eastman, C., Teicholz, P. Sacks, R., Liston, K. “BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors”. New York: Wiley (2008).

2.Ray Crotty, “The Impact of Building Information Modelling: Transforming Construction”. Spons Architecture Price Book (2011).

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1			2		1		1	1			1		1
CO2			2		1		1	1			1		1
CO3			2		1		1	1			1		1
CO4			2		1		1	1			1		1
CO5			2		1		1	1			1		1
CO6			2		1		1	1			1		1
Total			12		6		6	6			6		6
Scaled value			2		1		1	1			1		1

Course Code	Course Name	L	T	P	C
P24AR905	Lighting and Illumination	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course provides an in-depth understanding of lighting design principles and technologies. It facilitates the students to explore the interaction of light with architectural spaces, materials, and the environment. The course equips students with skills to design functional and aesthetically pleasing lighting systems. This course further enlightens the impact of lighting on human well-being and sustainability.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Analyze the fundamental principles of lighting and their impact on architectural spaces.	K4
CO2	Apply lighting design techniques to create functional and aesthetically pleasing environments.	K3
CO3	Evaluate the effectiveness of natural and artificial lighting in enhancing energy efficiency.	K5
CO4	Design integrated lighting systems that respond to specific architectural requirements.	K6
CO5	Critically assess the role of advanced lighting technologies in sustainable building practices.	K5
CO6	Develop lighting plans for urban and landscape environments using simulation tools.	K6

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO PRINCIPLES OF LIGHTING **5**

Fundamentals of light: Physics of light, Color temperature, and Light measurement (lumens, lux, etc.), Human visual perception and the Psychology of light - The interaction between light and materials: Reflection, Refraction, Absorption, Types of lighting: Ambient, Task, Accent, and Decorative lighting

NATURAL AND ARTIFICIAL LIGHTING IN ARCHITECTURE **10**

Daylighting **P**rinciples and Strategies, Solar geometry and its Application in Architectural design, Techniques for controlling Natural light: Shading devices, Light shelves, and Reflective surfaces - The impact of Natural light on Indoor environments and Energy efficiency.

Overview of Artificial lighting sources: Incandescent, Fluorescent, LED, and OLED technologies, Luminaries and Lighting fixtures: Types, Design considerations, and Selection criteria, Lighting controls: Dimmers, Sensors, and Smart lighting systems - Advances in lighting technologies: Tuneable white lighting, Circadian lighting, and Smart lighting networks.

LIGHTING DESIGN TECHNIQUES, SIMULATION AND VISUALIZATION **10**

The process of lighting design: Concept development, Technical design, and Implementation, Layering light: Combining Ambient, Task, and Accent lighting, Lighting for different spaces: Residential, Commercial, Industrial, and Public spaces - Lighting for Special environments: Museums, Galleries, Theaters, and Healthcare facilities. - Introduction to Lighting simulation software (e.g., DIALux, Relux, Radiance), Techniques for visualizing Lighting designs in 3D modeling tools, Simulation of Daylight and Artificial lighting scenarios, Evaluating lighting performance through simulations.

LIGHTING IN URBAN AND LANDSCAPE DESIGN **10**

Urban lighting: **S**treet lighting, Public spaces, and Architectural illumination, Landscape lighting: Principles and Techniques for Outdoor environments - The Impact of lighting on Urban safety, Aesthetics, and Navigation, Lighting master plans for Urban and Landscape projects.

SUSTAINABLE AND INTELLIGENT LIGHTING, FUTURE TRENDS IN LIGHTING AND ILLUMINATION **10**

Energy - efficient lighting design and Sustainable practices, Integration of lighting with Building Management Systems (BMS) and IoT - The role of lighting in green building certification (LEED, WELL) - Case studies on sustainable lighting solutions in architecture - Innovations in lighting: Holographic lighting, Li-Fi, and Adaptive lighting systems - The role of lighting in Smart cities and Urban development, Human-centric lighting and its applications in Health and productivity - The future of lighting design: Emerging technologies and their Architectural implications.

d. Activities

- Perform a market study on various lighting products from vendors and explain their applications in building Illumination.
- Criticize the role of lighting in green buildings and sustainability.
- Prepare a conceptual lighting design framework to be applied on various building typologies.

e. Learning Resources

1. Kao Chen, “Energy Management in Illuminating Systems”, 1st Edition, Routledge, 1999.
2. Derek Phillips, “Daylighting: Natural Light in Architecture”, 1st Edition,

Architectural Press, 2004.

3. Jack L.Lindsey, "Applied Illumination Engineering", 2nd edition, The Fairmont press, inc , 1997.
4. Robert Simpson, "Lighting Control: Technology and Applications", 1st Edition, Focal press, 2003.
5. R. H. Simons, A.R. Bean, "Lighting Engineering: Applied Calculations", 1st Edition, Routledge, 2000.
6. Sage Russell, "The Architecture of Light: Architectural Lighting Design Concepts and Techniques: Volume 1", 1st Edition, Conceptnine, 2008.
7. Mark Karlen, Christina Spangler, James R. Benya, "Lighting Design Basics", Wiley, 2017.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	1	1			1						1		1
CO2	1	1			1						1		1
CO3	1	1			1						1		1
CO4	1	1			1						1		1
CO5	1	1			1						1		1
CO6	1	1			1						1		1
Total	6	6			6						6		6
Scaled value	1	1			1						1		1

Course Code	Course Name	L	T	P	C
P24AR906	Interior Design	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course is the gateway to understand the art and science of creating environments that are not only visually appealing but also practical and reflective of personal and cultural identities. It explores the foundational principles of design, including space planning, color theory, and material selection.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Develop comprehensive design concepts and create spaces that enhance user experience through effective spatial planning integrating aesthetics and function.	K3
CO2	Produce detailed design plans and presentations with technical accuracy	K3
CO3	Understand various materials, finishes, and furnishings, including their properties and sustainability and interpret while designing.	K2
CO4	Apply principles of human-centric design to create comfortable and accessible spaces by addressing diverse user needs and preferences effectively	K3
CO5	Learn to manage and coordinate interior design projects from start to finish, including budgeting and scheduling.	K3
CO6	Develop skills to analyse design challenges and create and depict innovative solutions through various formats.	K4

c. Course Syllabus **Total: 45 Hours**

THEORIES OF INTERIOR DESIGN **9**

Design Vocabulary of Interior Space: Principles and Elements - Introduction to Furniture design as an integral element - Study of Evolution of furniture - Ergonomics and Anthropometry study.

SUSTAINABLE INTERIORS **9**

Concept of sustainable interiors - Application - Principles of Sustainable interior design - Green interiors - Indoor Environmental Quality - Efficient use of space, Energy and water in Sustainable interiors - Acoustic comfort, Thermal comfort and Visual comfort - Alternate Materials in Interior Design - Material selection - Comparative energy performance, emission performance and financial performance. Plantscaping; use of tropical, subtropical herbaceous, in Interiorscaping, Landscaping Indoor décor ideas complementing landscape interiors such as Murals, Artworks, Stones, Metal arts, Statues and Modern art installations.

INTERIOR LIGHTING AND INTERIORSCAPING **9**

Light – as a design parameter - Perception - The Sense of Sight - Psychology - Emotional Impact - Degrees of Stimulation - Degrees of Brightness Contrast - Daylight - Daylight factor - Understanding of National Lighting code (NLC) Illumination - Light fixtures, Smart lighting - Major techniques of Smart lighting .

.

CONTEMPORARY INTERIORS **9**

Importance of culture in interior design - Cultural representation in the Interior design - Contemporary Practices in India – Case studies of current practitioners India – Critical Understanding of the current trends – Holistic understanding of the Multiple design philosophies pertaining to Current India.

CASE STUDY **9**

Conduct a study on concept of green building - Analyse the concept, Design, Interior elements, Materials and Construction techniques - Interview with appropriate persons and make a case study report.

d. Activities

- Spend time researching various design styles and multi-functional space solutions. Gather inspiration from magazines, online platforms, or design case studies.
- Create a mood board that includes color schemes, materials, furniture, and décor elements that reflect the design style you want to achieve. Explain how each element contributes to both functionality and aesthetics.
- Create a digital or physical presentation of your design. Include floor plans, 3D renderings, and mood boards. Prepare a brief narrative explaining your design choices and how the space effectively meets the functional and aesthetic needs.

e. Learning Resources

1. Francis.D.K. Ching, “Interior Design Illustrated”, V.N.R. Pub., NY 1987.
2. Julius Penero and Martin Zelnik, “Human Dimensions and Interior space” Whitney Library of Design, NY 1979.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1	1	1			1	1					1		1
CO2	1	1			1	1					1		1
CO3	1	1			1	1					1		1
CO4	1	1			1	1					1		1
CO5	1	1			1	1					1		1
CO6	1	1			1	1					1		1
Total	6	6			6	6					6		6
Scaled value	1	1			1	1					1		1

Course Code	Course Name	L	T	P	C
P24AR954	Sustainable Habitat Design and Construction	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course imparts a thorough understanding of sustainable concepts and its impact in the built environment has changed throughout time. It offers details on sustainable ideas and concepts, ranging from historical and vernacular architecture to modern interpretations of the principles of sustainability.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand the evolution of sustainability in built environment from the past to the present.	K2
CO2	Obtain a comprehensive Knowledge about sustainable principles followed in vernacular architecture and	K2
CO3	Articulate key concepts and principles of sustainability as they apply to the built environment, including energy efficiency, resource conservation, and environmental impact reduction.	K2
CO4	Evaluate the environmental impact of building materials, construction methods, and architectural designs, using tools and methodologies for life cycle assessment and sustainability metrics.	K5
CO5	Apply best practices in sustainable building design and management, including compliance with relevant regulations, standards, and certification systems (e.g., LEED, BREEAM).	K3
CO6	Interpret the knowledge in contemporary architecture and justify sustainable design choices	K3

c. Course Syllabus **Total: 45 Hours**

INTRODUCTION TO SUSTAINABILITY **6**

Basics of Ecology, Ecosystems, Energy and Material cycles in nature - Function of Ecosystem - Concept of Sustainability and Sustainable Development - Issues of Sustainability in the current world - Difference between Green and Sustainable design - Need, Premise and Strategies for Sustainable and Green design - Need for finding Holistic solutions.

SUSTAINABLEBUILT ENVIRONMENT ACROSS HISTORY **12**

Life style of Early humans - Evolution of Sustainability - Ancient and Traditional perspectives in Neighborhood Planning and Architecture from Cultures across the world - Planning principles and Concepts of Historic and Vernacular Indian cities/Settlements with respect to sustainability - Cultural beliefs associated with the Principles/ Concepts.

TRADITIONAL ARCHITECTURE AND ITS RESPONSE TO CLIMATE 9

Sustainable architecture in human settlement planning and housing – examples from vernacular and planned cities in different geo-climatic zones. Climatic response of vernacular architecture - analytical studies including developing scientific evidence. Water management in buildings- water saving/ demand management, water harvesting for recharge and use, reuse/ recycling.

SUSTAINABILITY LESSONS FROM TRADITIONAL ARCHITECTURE 9

Scale and context of sustainability, Issues and Solutions in the Current world - Relevance of Traditional and Vernacular Architecture in finding Sustainable solutions to Present situations - Importance of Application of Principles of Traditional and Vernacular architecture in Modern context to achieve Sustainability in various aspects - Urban Built space ratios, Urban street canyons, Environmental design and Cultural identity, etc., Case studies of Contemporary examples inspired from the past.

STRATEGIES FOR SUSTAINABLE DESIGN **9**

Community Participation in developing sustainable designs - Participatory approaches to Learning and Development. Building and Planning requirements. Green Building Evaluation Systems: LEED, GRIHA - Legal instruments/ incentives for sustainable buildings - New Concepts and Trends in Green buildings, National and International.

d. Activities

- Develop and propose innovative solutions for sustainable design and construction that integrate energy-efficient systems, sustainable materials, and eco-friendly practices.
- Conduct performance assessments of existing buildings and design projects, identifying opportunities for improvements in energy use, water conservation, and indoor environmental quality.

e. Learning Resources

1. Ken Yeang, 'Eco design - A Manual for Ecological Design', Wiley- Academy, Chichester,2008.

2. Sue Roafet all, 'Ecohouse: A Design Guide' Routledge, London, 2013.

3. Thomas E Glavinich, "Contractor's guide to Green Building Construction: Management, project delivery, documentation and risk reduction", Wiley, 2008.

4. Daniel Vallero and Chris Brasier; 'Sustainable Design - The science of sustainability and Green Engineering', Wiley, 2008.

5. Margaret Robertson, 'Sustainability Principles and Practice', Routledge, Abingdon, 2017.

6. Martin A. A. Abraham, 'Sustainability Science and Engineering: Defining Principles', Elsevier Science, 2005.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1						1		2	1	1	1		1
CO2						1		2	1	1	1		1
CO3						1		2	1	1	1		1
CO4						1		2	1	1	1		1
CO5						1		2	1	1	1		1
CO6						1		2	1	1	1		1
Total						6		12	6	6	6		6
Scaled value						1		2	1	1	1		1

Course Code	Course Name	L	T	P	C

P24AR955	Urban Landscape	3	0	0	3
Sustainable Development Goal					

Category: Professional Elective Course (PEC)

a. Preamble

This course explores the multifaceted world of urban landscapes, focusing on the creation and transformation of outdoor spaces within cities and metropolitan areas. The students will gain insight into how urban landscapes can enhance environmental sustainability, promote social interaction, and contribute to the cultural identity of a place. It gives knowledge to design spaces that not only beautify cities but also foster community well-being and ecological resilience.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Grasp ecosystem concepts, cycles, and environmental impact assessments.	K2
CO2	Design landscapes using plant characteristics and sustainable practices.	K3
CO3	Study the development and significance of historical and cultural landscapes.	K4
CO4	Assess impacts of industrialization on public spaces and modern design contributions.	K5
CO5	Apply sustainable design and management principles to urban landscapes.	K3
CO6	Analyze contemporary landscape projects and their effects on urban and eco-tourism spaces.	K5

c. Course Syllabus **Total: 45 Hours**

LANDSCAPE ECOLOGY **10**

Concept of Ecosystem: General Structure and Function (Ecological Terms) - Types of Biogeochemical cycles – Analysis and Evaluation - Environmental Impact Assessment (EIA) Theory and Practice - The role of Environmental Legislation and Evolution of landscape planning based on Ecosystem – Concepts and projects of McHarg, Carl Steinite, Warren Manning, Augus Hills, Phil Lewis – Izank Zonneveld, Ervin Zube - Landscape planning models.

PLANTING DESIGN **10**

Plant as a design element for structuring the landscape - Structural and Visual characteristics of plants - Principles of Visual composition - Plant association - Plant data sheet - Sustainable design – The role of plant material in environmental improvement, (e.g. soil conservation, modification of microclimate) - Sustainable landscape maintenance and management - Sustainable Planning and City form - Sustainable urban landscape, Landscape sustainability at the National and Regional level (LEEDS, BREAM) - Ecological and Botanical considerations in landscape design - Planting for wildlife, Land Rehabilitation, the role of planting in Water shed management - Design concepts and its construction methods of Terrace garden, Vertical garden / Sky garden - Urban forestry development and Management in present scenario.

CULTURAL AND HISTORIC LANDSCAPE **7**

Development of the enclosed garden in the Middle Ages - Renaissance – Italy, France and England, Romanticism - Concept of Sacred value of Natural landscapes - Early traditions and Beliefs about landscape and environment in East - Ancient Indian traditions – Vedic, Jainism, Buddhism and later Hindu movements - Transfer of concepts through Buddhism to China – Chinese landscape development —

Japanese gardens. Nomadic culture of central Asia – Spread of Islamic traditions to West and East.

CONTEMPORARY LANDSCAPE **8**

Industrialization and urbanization – Impacts and development of the concept of Public open spaces, Open space development in New towns, Parks movement - Open space development and its Urban design and planning context - Early industrial towns and the Garden city movement - Study of selected works of Modern landscape architects: Frederick Law Olmsted, Martha Schwartz, Burle Marx, Ravindra Bhan, Savita Pundae, Lawrence Halprin, Mikyoung Kim, Prabhakar Bhagwat, Rohit Marol and other pioneers.

CASE STUDIES **10**

Analysis and understanding of Philosophies of Contemporary landscape architect works in India and abroad - Eco tourism projects, Landscape in Civic spaces, Landscape projects at Urban level.

d. Activities

- Develop a planting design for a small urban space using different plant types and sustainable practices. Create a detailed design plan and justify your plant choices.
- Research and present a case study on a historical or cultural landscape, detailing its development and significance. Include visual examples and historical context.
- Write a report assessing the impacts of industrialization on public open spaces in a selected city, and analyze the contributions of a modern landscape architect to urban design.

e. Learning Resources

1. Rana P.B. Singh, 'Heritagescapes and Cultural Landscapes', Shubhi Publications, 2011.
2. Mauro Agnoletti, 'Conservation of Cultural Landscapes', CABI, 2006.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				1	1	1		2				1	1
CO2				1	1	1		2				1	1
CO3				1	1	1		2				1	1
CO4				1	1	1		2				1	1
CO5				1	1	1		2				1	1
CO6				1	1	1		2				1	1
Total				6	6	6		12				6	6
Scaled value				1	1	1		2				1	1

Course Code	Course Name	L	T	P	C
P24AR956	Anthropology and Architecture	3	0	0	3

Sustainable Development Goal	

Category: Professional Elective Course (PEC)

a. Preamble

This course offers a comprehensive understanding of human behavior and cultural traditions, encompassing the essence of anthropology., while architecture translates these insights into physical spaces. These domains can lead to more thoughtful, inclusive, and culturally sensitive design.

b. Course Outcomes

After successful completion of the course, the students will be able to

COs	Course Outcome	Knowledge Level
CO1	Understand how cultural and social factors influence architectural design and how built environments affect human behaviour.	K2
CO2	Apply key anthropological theories and concepts to the design of architectural spaces, considering cultural practices, social interactions, and environmental adaptations.	K3
CO3	Gain skills in conducting ethnographic field research to understand how people interact with and experience different built environments.	K2
CO4	Critically evaluate how architectural designs impact cultural practices and social interactions within various communities.	K5
CO5	Create architectural designs that are culturally responsive, addressing the needs, values, and practices of diverse communities.	K6
CO6	Analyse urban and community planning initiatives through the lens of anthropological insights into social behaviour and spatial needs.	K4

c. Course Syllabus **Total: 45 Hours**

RELATIONSHIP BETWEEN CULTURE, SOCIETY, ANTHROPOLOGY AND ARCHITECTURE **6**

Concepts of Culture, Society, Politics and Anthropology – Relation between Society and Built environment – Introduction to Cultural Anthropology view of architecture.

ANTHROPOLOGY OF TRADITIONAL ARCHITECTURE **10**

Architecture as a Process – Kinship and House societies – Perceptions of Built form – Conceptions of Space – Symbolism and Technology – Study of the above through Case study of Traditional architecture in India, Asia and Africa.

ANTHROPOLOGY AND PLACE MAKING **15**

Conditions of Modernity – Fragmentation of Society – Heidegger and Notions of Dwelling – C Noeberg Schultz and Notions of Genius Loci Rapoport and Studies on the meaning of Built environment – Joseph Rykwert and the idea of house – Bollnow and Idea of space – Jan Pieper and the notions of Sacred space.

AN OVER VIEW OF URBAN ANTHROPOLOGY **6**

Meaning of Urban Studies and Urban Anthropology – Role of cities – Urban Ethnography, Primary units, Major components and Units of Integration – Anthropology and Contemporary Urban issues.

SEMINAR **8**

Students would make Presentations exploring the Relevance and Impact of Anthropological studies on Contemporary architecture and Design through readings/Case studies.

d. Activities

- Presentations evaluating specific architectural projects in terms of their cultural and social impacts.
- Case studies on the preservation and adaptation of historical sites, demonstrating an understanding of both anthropological and architectural considerations.

e. Learning resources

1. Claire Melhuish (ed); "Architecture and Anthropology" AD Vol 66 No 11/12 Nov - 1996

2. Edwin James; "Anthropology of the City"; Prentice Hall; 1977.

3. J Carstern and S H Jones; "About the house: Levi Strauss and Beyond"; Cambrige University Press; 1955.

4. Joseph Rykwert, "Idea of a Town: The Anthropology of Urban Form in Rome"; 1976.

5. Joseph Rykwert; "On Adams house in Paradise"; MIT Press 1987.

6. Nold Egenter; "The review of the Primitive in Architecture – Architectural Anthropology" Research Series Vol. I and II; Structura Mundi; 1992 and 1996.

7. Roxanna Wasterson; "The living House Anthropology of Architecture in S E Asia"; Oxford Press.

COs - POs / PSOs Articulation Matrix

	POs										PSOs		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**
CO1				2				1		1		1	1
CO2				2				1		1		1	1
CO3				2				1		1		1	1
CO4				2				1		1		1	1
CO5				2				1		1		1	1
CO6				2				1		1		1	1
Total				12				6		6		6	6
Scaled value				2				1		1		1	2