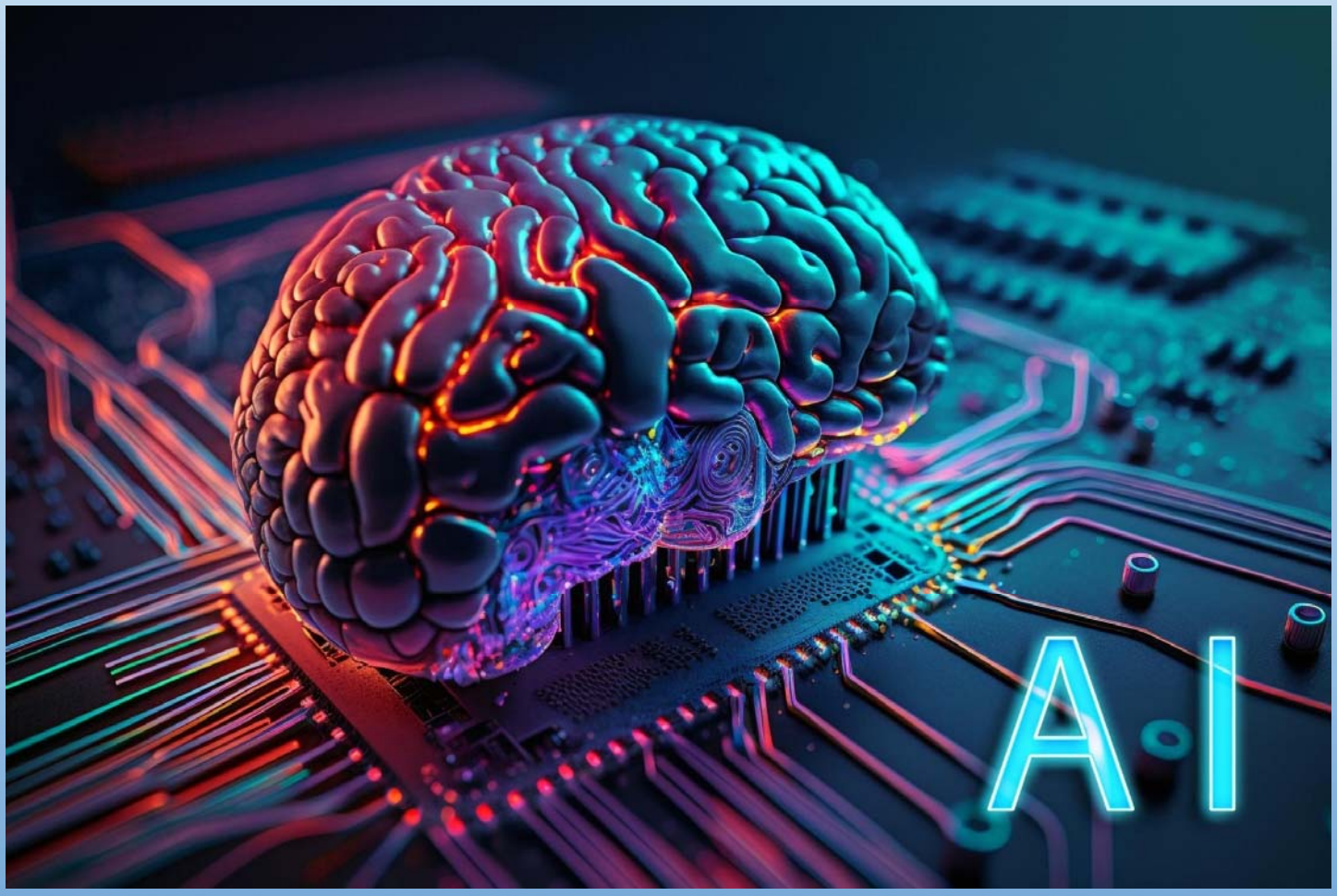
SHARDA UNIVERSITY
Beyond Boundaries

NAAC A+ ACCREDITED

SHARDA SCHOOL OF DESIGN, ARCHITECTURE AND PLANNING



AI Principles in Architecture & Design

NV41001

VALUE ADDED COURSE
BROCHURE 2025-26

ABOUT THE UNIVERSITY

Sharda University is a leading NAAC A+ educational institution based out of Greater Noida, Delhi NCR. A Venture of the well-known Sharda Group of Institutions (SGI). The university has established itself as a high-quality education provider with major focus on holistic learning and imbibing competitive abilities in students.

ABOUT SCHOOL

Sharda School of Design, Architecture & Planning (SSDAP) prepares the students for the real world they can make a lasting impact in designing the future and have an exciting and rewarding career. The students at SSDAP have crafted the world as renowned landscape architects, urban planners, urban designers, and history preservationists.

The school's nationally accredited degree programs, world -class faculty, and state-of-the-art facilities connect to provide the students with a broad range of opportunities in both the public and private sectors of the industry. SSDAP leads the students through both practical and theoretical learning until they can master in an innovative design that reflects art and science.

The school has forged numerous connections and partnerships with schools and professionals in countries around the world. The faculty comprises academicians from internationally renowned universities such as the School of Planning & Architecture, B.I.T Mesra, National Institute of Fashion Technology (NIFT), Sheffield University, Nottingham Trent University and Delhi College of Art, University of Delhi as well as leading Architectural practitioners and Planning professionals from all over the country.

ABOUT DEPARTMENT

Architects must understand the nature of human interaction within the larger environmental context. This is the core idea on which the Department of Architecture is built upon, where architecture is understood not in the narrow terms of building, but in the larger context of the built environment. The world around us is moving at a pace more rapid than ever before, and the architectural professionals of tomorrow need to be sensitive towards the social responsibilities of environmental intervention that are an inevitable consequence when it comes to the actual practice of architecture.

Given that in the ever-changing world, the architect needs to be prepared to adapt to the environment around, the programs at the Department of Architecture recognize the multiplicity and changing nature of future roles open to the architect. The students are afforded the freedom to engage with the discipline at many levels, and through multiple channels where they are allowed to choose their own unique pathways through the course, thereby (re)creating and (re)producing themselves as professionals with multiple expertise.

The school has an interdisciplinary approach that sources from varied fields such as Mass Communication, Design, and Management etc. Architecture students will have the opportunity to tailor their course to their needs, thereby; they could be studying photography, choreography, visual communication or any other elective as a part of the larger architecture course.

Vision of Department

To be amongst the top institutes in India imparting quality education and professional skills to the students to emerge as architects of global caliber and thus the society in large

Mission of Department

- To create and sustain a stimulating and responsive academic inclusive environment.
- To regularly enhance the teaching contents & techniques in keeping with current and future trends.
- To provide a competitive and career-oriented programme.
- To encourage students to be socially responsive and responsible architects.

About Value Added Course for Session 2024-2025

Course Outcomes

In accordance with the University requirement for Value Added Courses, the Department of Architecture intends to conduct a course on “AI- Principles in Architecture & Design " for the 2025-2026 session aims to introduce intermediate AI techniques such as machine learning and natural language processing for applications in design optimization and spatial analysis, to make AI accessible to all students.

After completion of the course the students will be able to

CO1: Understand and apply supervised learning for categorizing design elements (e.g., facade types, building materials).
CO2: Implement and evaluate regression models to predict design costs and timelines.
CO3: Use clustering algorithms for space categorization and urban design analysis.
CO4: Apply reinforcement learning concepts to optimize layout planning and resource allocation.
CO5: Understand neural networks and apply them in generative design or image processing tasks.
CO6: Discuss ethical considerations of AI in design, such as design standardization biases.

AI- Principles in Architecture & Design

Date	Advanced Data Techniques for Design	Duration
18-07-2025	Functions for design workflows (e.g., reusable code for layout adjustments)	4
25-07-2025	Data structures for design details (e.g., dictionaries for material specs)	4
01-08-2025	NumPy for spatial metrics and design calculations	4
	Machine Learning in Design and Planning	
08-08-2025	Supervised and unsupervised learning for design classifications (e.g., landscape vs. structure)	4
15-08-2025	Classification techniques for architectural and design data (e.g., material identification)	4
22-08-2025	Predictive modeling for cost estimation and project timelines	4
	NLP in Design Documentation	
29-08-2025	Processing design documentation and user feedback	4
05-08-2025	Sentiment analysis on client reviews for design refinement	4
12-08-2025	NLP techniques for summarizing design briefs and specifications	4
	Design-Specific Libraries and Tools	
19-08-2025	Introduction to libraries like OpenCV for image analysis in design and architecture	4
26-08-2025	PyCaret for simplified machine learning model building in design data	4
03-09-2025	Exercises with design and architecture datasets for pattern recognition	4
	Intermediate Project – Predictive Design Modeling	
10-09-2025	Identifying and cleaning design data for predictive analysis	4
17-09-2025	Using ML algorithms (e.g., decision trees) to forecast project resource needs	4
24-09-2025	Evaluating models to optimize layout for sustainability	4

Faculty/Trainer Profile

Name of the Trainers: Satvinder Walia

Designation: Assistant Professor

Employee Code: 0002303

Department: Architecture

Mobile No. 981005474

Email ID: ss.walia@sharda.ac.in

Trainer Profile: Specialized in Creative Design, Motion Media & Interactive Media, Autodesk Certified Professional with over 17 years of Industry as well as Academic experience. Expertise in Multimedia Software training worked for various clients including RedHat, CII, Cisco, Intel, MTNL, etc. As Head - Creative & Digital Design with Arena Animation worked with Institute of Design Engineering & Architecture, Rai University as an Assistant Professor.

Syllabus

School:		**School of Design, Architecture & Planning**		
Department		**Architecture**		
Program:		**B.Arch**		
Branch:				
1	Course Code			
2	Course Title	**AI Principles in Architecture & Design**		
3	Credits			
4	Contact Hours (L-T-P)	2-0-2		
	Course Status	VAC		
5	Course Objective	To build upon introducing intermediate AI techniques such as machine learning and natural language processing for applications in design optimization and spatial analysis.		
6	Course Outcomes	**CO1:** Understand and apply supervised learning for categorizing design elements (e.g., facade types, building materials). **CO2:** Implement and evaluate regression models to predict design costs and timelines. **CO3:** Use clustering algorithms for space categorization and urban design analysis. **CO4:** Apply reinforcement learning concepts to optimize layout planning and resource allocation. **CO5:** Understand neural networks and apply them in generative design or image processing tasks. **CO6:** Discuss ethical considerations of AI in design, such as design standardization biases.		
7	Course Description	This course builds on foundational AI skills, introducing techniques in machine learning, NLP, and advanced data handling. Students apply these tools in tasks like design classification, cost estimation, and data visualization, while also learning ethical considerations in design AI applications.		
8	Outline syllabus			CO Mapping
	Unit 1	**Advanced Data Techniques for Design**		
	A	Functions for design workflows (e.g., reusable code for layout adjustments)		CO1
	B	Data structures for design details (e.g., dictionaries for material specs)		CO2
	C	NumPy for spatial metrics and design calculations		CO2
	Unit 2	**Machine Learning in Design and Planning**		
	A	Supervised and unsupervised learning for design classifications (e.g., landscape vs. structure)		CO3
	B	Classification techniques for architectural and design data (e.g., material identification)		CO3
	C	Predictive modeling for cost estimation and project timelines		CO3

	Unit 3	**NLP in Design Documentation**			
	A	Processing design documentation and user feedback			CO4
	B	Sentiment analysis on client reviews for design refinement			CO4
	C	NLP techniques for summarizing design briefs and specifications			CO4
	Unit 4	**Design-Specific Libraries and Tools**			
	A	Introduction to libraries like OpenCV for image analysis in design and architecture			CO5
	B	PyCaret for simplified machine learning model building in design data			CO5
	C	Exercises with design and architecture datasets for pattern recognition			CO5
	Unit 5	**Intermediate Project – Predictive Design Modeling**			
	A	Identifying and cleaning design data for predictive analysis			CO5
	B	Using ML algorithms (e.g., decision trees) to forecast project resource needs			CO5
	C	Evaluating models to optimize layout for sustainability			CO6
	Mode of examination	Practical			
	Weightage Distribution	CA	ETE		
		75%	25%		
	Text book/s*				
	Other References				