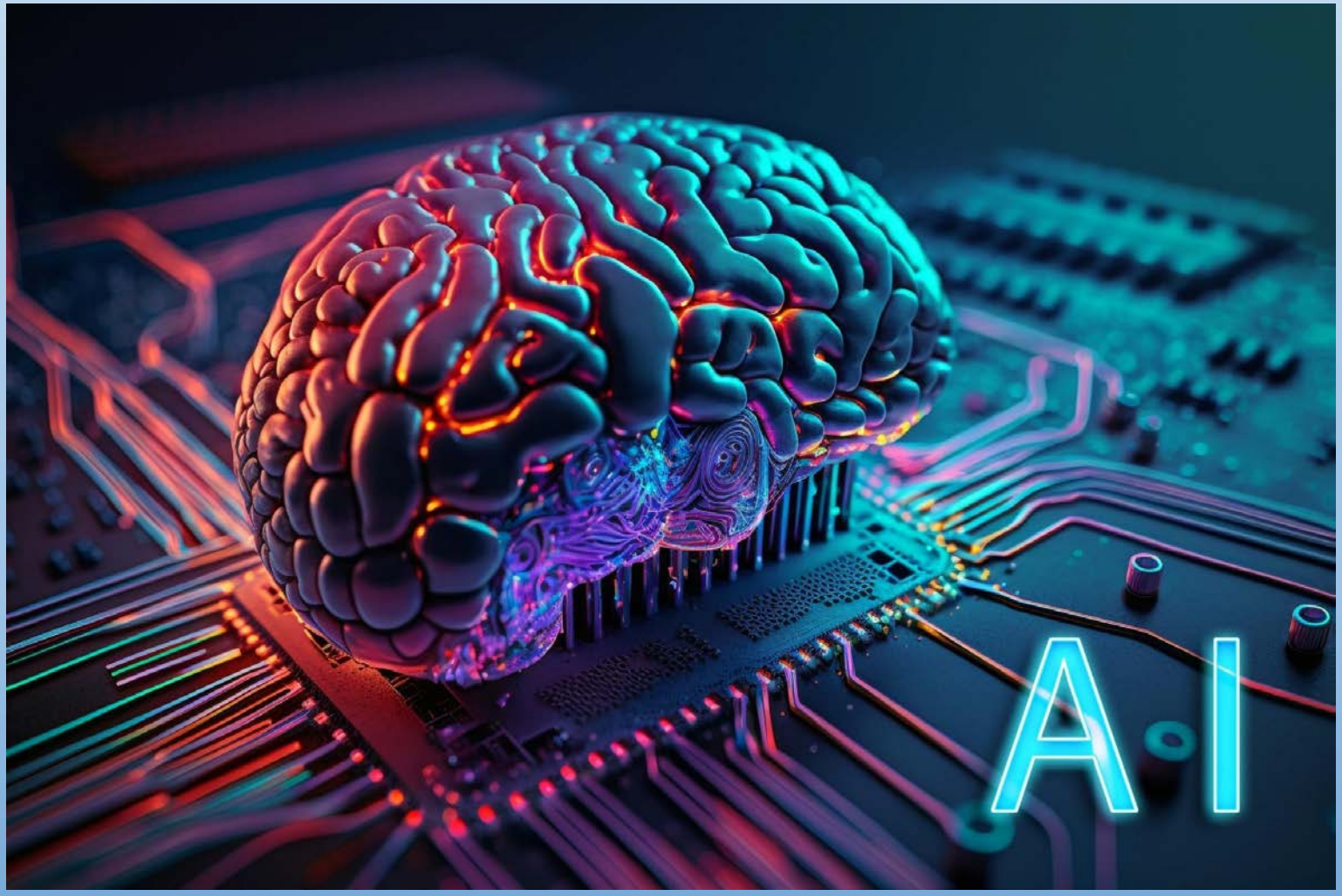
SHARDA UNIVERSITY
Beyond Boundaries

NAAC A+ ACCREDITED

SHARDA SCHOOL OF DESIGN, ARCHITECTURE AND PLANNING



AI- BASICS In Architecture & Design

NV40011

VALUE ADDED COURSE
BROCHURE 2024-25

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- Basics in Architecture & Design " for the 2024-2025 session aims to introduces fundamental AI concepts and practical skills to students without a strong mathematical background. It covers Python programming, prompt engineering, and essential mathematical concepts, with a focus on practical applications and intuitive understanding to make AI accessible to all students.

After completion of the course the students will be able to

CO1: Develop foundational programming skills, covering variables, data types, control structures, and functions, applied to design and architecture data.

CO2: Use data structures (e.g., lists, dictionaries, sets, tuples) and tools like Pandas to manage data related to design specifications and spatial analytics.

CO3: Apply prompt engineering to create AI-driven design assistance tools, enhancing client interaction and data visualization.

CO4: Generate visual insights using tools such as Matplotlib and Seaborn for architectural data, supporting spatial analysis and project planning.

CO5: Critically evaluate the ethical implications of AI in design, including privacy concerns, data biases, and societal impacts.

AI - Basics

Date	Content	Duration
	Understanding AI in Design and Architecture	
09-01-2024	Introduction to AI and its role in modern design tools (e.g., automated drafting, generative design, rastering)	2
16-01-2024	Types of AI: applications in architectural/design visualization and space optimization	2
23-01-2025	Ethical considerations: data privacy, AI bias in design standards	2
	Prompt Engineering for Design Applications	
30-01-2025	Essentials of prompt engineering: creating user-friendly prompts for design suggestions	2
06-02-2025	Designing prompts for spatial data summaries and layout configurations	2
13-02-2025	Case studies: prompt examples in virtual 3D model generation	2
	Data Analysis for Design and Architecture	
20-02-2025	Programming basics: variables, data types, operations	2
27-02-2025	Control structures for design data (e.g., loops for iteration over layouts)	2
06-03-2025	Introduction to spatial data structures for architectural applications	2
	Design Data Handling and Visualization	
13-03-2025	Using Pandas for design data management (e.g., material specs, layout parameters)	2
20-03-2025	Visualizing architectural and design data with Matplotlib and Seaborn (e.g., heatmaps for space usage)	2

27-03-2025	Working with datasets related to project metrics (e.g., client feedback, cost analysis)	2
	Introductory Project – Analyzing Design Data	
03-04-2025	Organizing and visualizing data on project timelines and space utilization	2
10-04-2025	Creating interactive dashboards for client presentations using Seaborn and Matplotlib	2
17-04-2025	Example: Visualizing trends in space allocation for different project types	2

Faculty/Trainer Profile

Name of the Trainers: Charu Jain

Designation: Associate Professor

Employee Code: 0002042

Department: Architecture

Mobile No. 9873022992

Email ID: charu.jain@sharda.ac.in

Trainer Profile: Professional and academic career spanning over a period of of 22+ years across functional sectors of architectural & Interior designing design and teaching. Done Bachelor of Architecture from Government College of Architecture, Lucknow in the year 1999 and Master of Architecture from I.I.T (Roorkee) in the year 2001. Core skills include compact Space planning, Innovative Teaching Methodology, Research and Construction Detailing.

Syllabus

School:		**School of Design, Architecture & Planning**	
Department		**Architecture**	
Program:		**B.Arch**	
Branch:			
1	Course Code		
2	Course Title	AI Basics in Architecture & Design	
3	Credits		
4	Contact Hours (L-T-P)	2-0-2	
	Course Status	VAC	
5	Course Objective	To introduce students in design and architecture to foundational AI concepts, focusing on practical skills in programming, prompt engineering, and data analysis, with applications in design and spatial planning.	
6	Course Outcomes	**CO1:** Develop foundational programming skills, covering variables, data types, control structures, and functions, applied to design and architecture data. **CO2:** Use data structures (e.g., lists, dictionaries, sets, tuples) and tools like Pandas to manage data related to design specifications and spatial analytics. **CO3:** Apply prompt engineering to create AI-driven design assistance tools, enhancing client interaction and data visualization. **CO4:** Generate visual insights using tools such as Matplotlib and Seaborn for architectural data, supporting spatial analysis and project planning. **CO5:** Critically evaluate the ethical implications of AI in design, including privacy concerns, data biases, and societal impacts.	
7	Course Description	This course provides a foundation in AI and programming tailored for design and architecture students. Emphasis is placed on prompt engineering, data analysis for architectural applications, and visualization using industry-relevant tools, making AI concepts accessible and applicable in design and planning.	
8	Outline syllabus		CO Mapping
	Unit 1	**Understanding AI in Design and Architecture**	
	A	Introduction to AI and its role in modern design tools (e.g., automated drafting, generative design, rastering)	CO1, CO2
	B	Types of AI: applications in architectural/design visualization and space optimization	CO1, CO2
	C	Ethical considerations: data privacy, AI bias in design standards	CO5
	Unit 2	**Prompt Engineering for Design Applications**	
	A	Essentials of prompt engineering: creating user-friendly prompts for design suggestions	CO3
	B	Designing prompts for spatial data summaries and layout configurations	CO3
	C	Case studies: prompt examples in virtual 3D model generation	CO3
	Unit 3	**Data Analysis for Design and Architecture**	
	A	Programming basics: variables, data types, operations	CO1
	B	Control structures for design data (e.g., loops for iteration over layouts)	CO1
	C	Introduction to spatial data structures for architectural applications	CO2
	Unit 4	**Design Data Handling and Visualization**	

	A	Using Pandas for design data management (e.g., material specs, layout parameters)			CO2
	B	Visualizing architectural and design data with Matplotlib and Seaborn (e.g., heatmaps for space usage)			CO4
	C	Working with datasets related to project metrics (e.g., client feedback, cost analysis)			CO2, CO5
	Unit 5	**Introductory Project – Analyzing Design Data**			
	A	Organizing and visualizing data on project timelines and space utilization			CO2
	B	Creating interactive dashboards for client presentations using Seaborn and Matplotlib			CO4
	C	Example: Visualizing trends in space allocation for different project types			CO4
	Mode of examination	Practical			
	Weightage Distribution	CA	ETE		
		75%	25%		
	Text book/s*				
	Other References				