



SARDAR PATEL UNIVERSITY

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

Vallabh Vidyanagar

Gujarat

Academic Program Structure

&

Curriculum

(Aligned with NEP-2020)

M.Sc. Artificial Intelligence & Machine Learning

NHEQF Level: 6.5

Entry NHEQF Level	:	5.5
Duration	:	Two Years (Four Semesters)
Total Courses	:	22
Total Learning Hours	:	2640
Total Credits	:	88
Total Marks	:	2050

Graduate Attributes (GAs)

Upon successful completion of the Programme, graduates are expected to attain the following Graduate Attributes:

GA1: Disciplinary Knowledge

Apply fundamental and advanced knowledge of Artificial Intelligence, Machine Learning, Data Structures, Programming, and Database Systems to solve real-world problems.

GA2: Problem Analysis

Identify, formulate, and analyze complex computational problems using appropriate algorithms, mathematical models, and statistical techniques.

GA3: Design & Development of Solutions

Design and develop efficient software systems, AI models, and data-driven applications using modern tools and technologies.

GA4: Programming & Technical Skills

Demonstrate proficiency in programming languages such as Python, R, and Java, and apply them in algorithm design, data analysis, and application development.

GA5: Modern Tool Usage

Use contemporary tools, frameworks, and platforms (e.g., ML libraries, databases, web technologies) effectively for developing intelligent systems.

GA6: Data Analysis & Interpretation

Analyze, visualize, and interpret complex datasets using statistical methods, data visualization techniques, and machine learning approaches.

GA7: Artificial Intelligence & Machine Learning Competency

Develop, evaluate, and deploy AI/ML models including deep learning and NLP techniques for solving domain-specific problems.

GA8: Research & Innovation

Demonstrate the ability to conduct research, explore emerging technologies (e.g., Generative AI), and innovate solutions through project development.

GA9: Communication Skills

Communicate technical information effectively through reports, presentations, and documentation in both academic and professional contexts.

GA10: Teamwork & Collaboration

Work effectively as an individual and as part of a team in multidisciplinary environments, especially during practicals and project work.

GA11: Ethics & Professional Responsibility

Understand and apply ethical principles in AI and computing, including data privacy, bias, and responsible use of technology.

GA12: Lifelong Learning

Recognize the need for continuous learning and adapt to rapidly evolving technologies in AI, data science, and software development.

GA13: Project Management & Leadership

Plan, execute, and manage projects efficiently, demonstrating leadership, time management, and decision-making skills.

Programme Educational Objectives (PEOs): [5-8]

Within 2–3 years of completing the Programme, graduates will be able to:

PEO1: Graduates will build strong foundational and advanced knowledge in computing, Artificial Intelligence, and Data Science to establish successful careers in industry or academia.

PEO2: Graduates will analyze complex problems and develop efficient, scalable, and innovative computational solutions using appropriate algorithms and technologies.

PEO3: Graduates will demonstrate expertise in programming, database systems, machine learning, and modern software development tools.

PEO4: Graduates will be prepared for diverse roles such as software developer, data analyst, AI engineer, or pursue higher education and research.

PEO5: Graduates will engage in research activities and apply innovative approaches to solve real-world challenges using emerging technologies like deep learning and generative AI.

PEO6: Graduates will practice professional ethics and understand the societal impact of computing technologies, including responsible AI and data privacy.

PEO7: Graduates will demonstrate effective communication, teamwork, and collaboration skills in multidisciplinary and professional environments.

PEO8: Graduates will continuously update their knowledge and skills to adapt to rapidly evolving technologies and industry demands.

PEO9: Graduates will develop leadership qualities and entrepreneurial mindset to manage projects, lead teams, or create technology-driven ventures.

PEO10: Graduates will integrate knowledge from computing, statistics, and domain-specific areas to develop intelligent and data-driven solutions.

Program Learning Outcomes (PLOs): [10-12]

Upon successful completion of the Programme, learners will be able to:

PLO1: Apply knowledge of computing, mathematics, and statistics to solve complex problems in Artificial Intelligence and data-driven domains.

PLO2: Identify, analyze, and formulate computational problems using appropriate algorithms, models, and techniques.

PLO3: Design, develop, and implement efficient software systems, AI models, and data-centric applications to meet specified requirements.

PLO4: Demonstrate proficiency in programming languages such as Python, R, and Java for problem-solving and application development.

PLO5: Use modern tools, platforms, and technologies including machine learning frameworks, databases, and web technologies effectively.

PLO6: Analyze, interpret, and visualize data using statistical methods and data visualization techniques to support decision-making.

PLO7: Develop and evaluate machine learning, deep learning, and natural language processing models for real-world applications.

PLO8: Conduct experiments, analyze results, and apply research methods to solve complex computing problems.

PLO9: Understand and apply ethical principles, data privacy, and responsible practices in computing and Artificial Intelligence.

PLO10: Communicate effectively in both written and oral forms, and work collaboratively in multidisciplinary teams.

PLO11: Demonstrate project management skills including planning, execution, and delivery of computing solutions.

Program Specific Learning Outcomes (PSLOs): [2-3]

PSLO1: Apply knowledge of Artificial Intelligence, Machine Learning, and Data Science techniques to develop intelligent and data-driven solutions for real-world problems.

PSLO2: Design and implement efficient software systems using appropriate programming languages, data structures, and database management techniques.

PSLO3: Utilize modern tools and technologies such as deep learning, natural language processing, and data visualization to analyze, interpret, and present complex data effectively.



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

M.Sc. Artificial Intelligence & Machine Learning (Semester-I)

Semester-I

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2TNC01AIM01	Artificial Intelligence	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC01AIM02	Mathematical and Statistical Foundations	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC01AIM03	Python Programming	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC01AIM04	Data Structure Algorithm	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC01AIM05	Relational Database Management System	2-0-0	60	02	10	15	25	25	50
DSC	P2TNC01AIM06	Practicals - I	0-8-0	120	04	20	30	50	50	100
				660	22					550

DSC: Discipline Specific Core **L:** Lecture **P:** Practical **T:** Tutorial **FA:** Formative Assessment **SA:** Summative Assessment



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M.Sc. Artificial Intelligence & Machine Learning (Semester-II)

Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2TNC02AIM01	Machine Learning	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC02AIM02	Advanced python Programming	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC02AIM03	OOPS using Java Programming	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC02AIM04	Systems Analysis, Design, and Engineering	4-0-0	120	04	20	30	50	50	100
DSC	P2TNC02AIM05	Human Computer Interaction	2-0-0	60	02	10	15	25	25	50
DSC	P2TNC02AIM06	Practicals - II	0-8-0	120	04	20	30	50	50	100
				660	22					550

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