



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

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

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

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

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2TNC02AIM01	Machine Learning	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Demonstrate understanding of fundamental concepts of machine learning, including types of learning techniques, dataset handling, data preprocessing, feature engineering, and real-world applications.

CLO2: Apply principles of Indian Knowledge Systems (IKS) in modern machine learning models to enhance logical reasoning and decision-making in algorithms such as decision trees, clustering, and neural networks.

CLO3: Implement regression techniques including linear regression, logistic regression, support vector regression, and decision trees for data modeling and prediction.

CLO4: Apply supervised learning classification algorithms such as K-Nearest Neighbour, Support Vector Machine, and decision tree classification for solving classification problems.

CLO5: Evaluate machine learning models using techniques such as train-test split, confusion matrix, class probabilities, and ROC curve analysis.

CLO6: Analyze and apply unsupervised learning methods including K-means, hierarchical clustering, DBSCAN, fuzzy c-means, and dimensionality reduction techniques like PCA for data analysis and pattern discovery.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Introduction Introduction and motivation for machine learning; Examples of machine learning applications, Types of machine learning techniques, Working with Datasets, Data pre-processing techniques, Feature Engineering. Use of IKS principles in modern ML models (decision trees, clustering, neural networks).	Interactive Lecture, Case Study, ICT Tools	CLO1, CLO2
II	Regression Models Linear Regression, Logistic Regression, Support Vector Regression, Decision Trees, Fitting datasets and evaluating their performance set, Making predictions on new data.	Model Building, Lab Practice	CLO3
III	Supervised Machine Learning (Classification Techniques) K-Nearest Neighbour, Support Vector Machine, Decision tree Classification, Train/test split, Confusion matrix for evaluation, Class probabilities and class predictions, ROC Curve: Plot and Interpret.	Practical ML Tasks, Data Analysis	CLO4, CLO5



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IV	Unsupervised Machine Learning (Clustering and other applications) K-means clustering, Hierarchical and Density Based Clustering (DB Scan), Fuzzy c means clustering, Dimensionality Reduction and PCA.	Research-Oriented Learning, Visualization	CLO6
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- (*) Learning Pedagogies/Methods**

Notes:

(1) The following list is suggestive. Any other learning pedagogies relevant to discipline-specific requirements can be added.

(2) Acronyms/abbreviations of the terms can be placed in the above table.

(a) Interactive Classroom Lecture

(b) Classroom Lecture (CL)

(c) Seminars (Student-led and Faculty-moderated)

(d) Micro-Projects/Mini Research Tasks

(e) Industrial Visit/Field Visit/Institutional Visit

(f) Problem-Based Learning (PBL)

(g) Research-Oriented Learning (Literature Review, Tool Construction, Data Analysis Exercises)

(h) Collaborative Learning (Group Tasks, Peer Discussion, Joint Presentations)

(i) Experiential Learning (Community Engagement, Internship-linked Activities, Practice-based Tasks)

(j) ICT-Enabled Learning (LMS-based Tasks, Digital Resources, Virtual Labs/Webinars)

(k) Reflective Practices (Learning Journals, Reflective Notes, Concept Mapping)

(l) Self-Directed Learning (Guided Readings, Concept Exploration Tasks)

- Assessment Methodologies**

(A) Internal Assessment

a. Internal Formative assessment (30)

(a) Quiz

(b) Assignment

(c) Seminar/Presentation

(d) Group Task

(e) Attendance

b. Internal Summative Assessment (20)

(a) Mid -Term

(B) External Assessment (50)

(b) End-Term

(A) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1, CLO2	30	1	1	12	14
II	CLO3	32	1	1	10	12
III	CLO4, CLO5	28	1	1	10	12
IV	CLO6	30	1	1	12	14
		120	04	04	34	50



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• Assessment and Evaluation

Sr.No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity	50%
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50%

• CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	-	-	-	-	-	2	-	-
CLO2	2	3	-	2	-	-	-	2	-	-
CLO3	-	2	3	2	-	-	-	-	-	-
CLO4	-	2	3	2	-	-	-	-	-	-
CLO5	-	-	3	2	-	-	-	-	2	-
CLO6	-	2	3	2	-	-	-	-	-	-

Values to CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO – PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

• Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	Machine Learning	Tom M. Mitchell	1997	McGraw Hill
2	Pattern Recognition and Machine Learning	Christopher Bishop	2006	Springer
3	Hands-On Machine Learning	Aurélien Géron	2019	O'Reilly
4.	Machine Learning: A Probabilistic Perspective	Kevin Murphy	2012	MIT Press
5	Introduction to Machine Learning	Ethem Alpaydin	2020	MIT Press

• Online Resources (Open Source)

Sr.No.	Description of Resource(s)	Weblink
1	Coursera ML by Andrew Ng	https://coursera.org
2	edX ML Courses	https://edx.org
3	Kaggle Learn	https://kaggle.com/learn
4	Google ML Crash Course	https://developers.google.com/machine-learning



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

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2TNC02AIM02	Advanced Python Programming	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Demonstrate understanding of Python programming concepts including the Zen of Python, common idioms, lambda functions, list comprehensions, and generator expressions.

CLO2: Apply advanced Python features such as decorators, introspection (globals(), locals(), inspect module), and monkey patching for efficient and flexible program design.

CLO3: Analyze and debug Python programs using tools like pylint and unittest, ensuring code quality, testing, and reliability.

CLO4: Implement database operations using Python DB API, including connecting to databases, executing queries, fetching data, and managing transactions securely.

CLO5: Develop deep learning models by implementing forward propagation algorithms and coding various activation functions in Python.

CLO6: Design and implement supervised and unsupervised neural network models using Python for solving real-world problems.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Python Programming The Zen of Python, Common idioms, Lambda functions, List comprehensions, Generator expressions.	Coding Practice, Interactive Learning	CLO1
II	Meta Programming and Analysis Implicit properties, globals() and locals() and Attributes, The inspect module, Decorators, Monkey patching, analyzing programs Using pylint and unittest, Testing and Debugging.	Debugging Tools, Practice	CLO2, CLO3
III	Database access using python The DB API, Available Interfaces, connecting to a server, Creating and executing a cursor, Fetching data, Parameterized statements, Metadata, Transaction control.	Hands-on DB Practice	CLO4
IV	Advance python application in deep learning and neural network Implementation of forward propagation algorithm. Coding of various activation functions like linear, triangular, trapezoidal etc - Coding of deep learning network with suitable examples. Implementing supervised and un-supervised neural networks using python.	Project-Based Learning	CLO5, CLO6



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- (*) Learning Pedagogies/Methods**

Notes:

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- (a) Interactive Classroom Lecture
- (b) Classroom Lecture (CL)
- (c) Seminars (Student-led and Faculty-moderated)
- (d) Micro-Projects/Mini Research Tasks
- (e) Industrial Visit/Field Visit/Institutional Visit
- (f) Problem-Based Learning (PBL)
- (g) Research-Oriented Learning (Literature Review, Tool Construction, Data Analysis Exercises)
- (h) Collaborative Learning (Group Tasks, Peer Discussion, Joint Presentations)
- (i) Experiential Learning (Community Engagement, Internship-linked Activities, Practice-based Tasks)
- (j) ICT-Enabled Learning (LMS-based Tasks, Digital Resources, Virtual Labs/Webinars)
- (k) Reflective Practices (Learning Journals, Reflective Notes, Concept Mapping)
- (l) Self-Directed Learning (Guided Readings, Concept Exploration Tasks)

- Assessment Methodologies**

(A) Internal Assessment

c. Internal Formative assessment (30)

- (a) Quiz
- (b) Assignment
- (c) Seminar/Presentation
- (d) Group Task
- (e) Attendance

d. Internal Summative Assessment (20)

- (a) Mid -Term

(B) External Assessment (50)

- (b) End-Term

(B) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1	30	1	1	12	14
II	CLO2, CLO3	32	1	1	10	12
III	CLO4	28	1	1	10	12
IV	CLO5, CLO6	30	1	1	12	14
		120	04	04	34	50



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- Assessment and Evaluation

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- CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	-	-	-	-	-	2	-	-
CLO2	-	3	2	-	-	-	-	2	-	-
CLO3	-	2	3	-	-	-	-	-	2	-
CLO4	-	2	3	2	-	-	-	-	-	-
CLO5	-	-	3	2	-	-	-	-	-	-
CLO6	-	-	3	3	-	-	-	-	-	-

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Strong	3
Moderate	2
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No correlation	-

- Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	Fluent Python	Luciano Ramalho	2015	O'Reilly
2	Python Cookbook	David Beazley	2013	O'Reilly
3	Effective Python	Brett Slatkin	2019	Addison-Wesley
4	Learning Python	Mark Lutz	2013	O'Reilly
5	Deep Learning with Python	François Chollet	2017	Manning

- Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Python Official Docs	https://python.org
2	Real Python	https://realpython.com
3	Coursera Python	https://coursera.org
4	Kaggle Python	https://kaggle.com



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

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2TNC02AIM03	OOPS using Java Programming	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Demonstrate understanding of Java programming fundamentals, including history, features, JDK/JRE, IDE usage, data types, operators, control structures, strings, and input handling using the Scanner class.

CLO2: Apply object-oriented programming concepts such as classes, objects, methods, inheritance, polymorphism, interfaces, and abstraction to design modular programs.

CLO3: Analyze and implement advanced Java features including exception handling, file handling, collections framework, and multithreading for robust application development.

CLO4: Develop graphical user interface (GUI) applications using AWT and Swing, including layout management and event handling mechanisms.

CLO5: Design and implement database-driven applications using JDBC, including establishing connections, executing queries, and managing data.

CLO6: Integrate core Java concepts, GUI design, and database connectivity to build complete, real-world software applications.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Introduction to Java The Java programming language: history, evolution, features, Introduction to the Java programming environment, JDK, JRE, Introduction to the IDE, Data types and wrapper classes, operators, Control structures, String handling, Scanner Class.	Coding Practice	CLO1
II	Introduction to Object-oriented Programming Basic concepts of object-oriented programming, Classes, instances, methods, Static and non-static members, Packages, Inheritance and polymorphism, method overriding, Final and abstract classes, abstract methods, Interfaces.	Design Exercises	CLO2
III	Other Features of the Java Platform Exception handling, Input-output and file handling, The collections framework, Introduction to the java. util package Multithreading.	Lab Practice	CLO3
IV	Developing Graphical Programs and Accessing Database Introduction to AWT, writing graphical programs using AWT, The Swing library, Writing graphical programs using Swing, managing layout using Swing, Event handling using Swing Introduction to JDBC, Different types of JDBC drivers, Developing database applications using JDBC.	Project-Based Learning	CLO4, CLO5, CLO6



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- (*) Learning Pedagogies/Methods**

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- Classroom Lecture (CL)
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- Collaborative Learning (Group Tasks, Peer Discussion, Joint Presentations)
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- ICT-Enabled Learning (LMS-based Tasks, Digital Resources, Virtual Labs/Webinars)
- Reflective Practices (Learning Journals, Reflective Notes, Concept Mapping)
- Self-Directed Learning (Guided Readings, Concept Exploration Tasks)

- Assessment Methodologies**

(A) Internal Assessment

a. Internal Formative assessment (30)

- Quiz
- Assignment
- Seminar/Presentation
- Group Task
- Attendance

b. Internal Summative Assessment (20)

- Mid -Term

(B) External Assessment (50)

- End-Term

(B) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
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III	CLO3	28	1	1	10	12
IV	CLO4, CLO5, CLO6	30	1	1	12	14
		120	04	04	34	50

- Assessment and Evaluation**



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Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity,	50
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50

• CLOs – PLOs Matrix

CLO	PLO									
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CLO3	-	2	3	-	-	-	-	-	2	-
CLO4	-	-	3	2	-	-	-	-	-	-
CLO5	-	-	3	3	-	-	-	-	-	-
CLO6	-	-	3	3	2	-	-	-	-	-

Values to CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO – PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

• Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	Java: The Complete Reference	Herbert Schildt	2018	McGraw Hill
2	Core Java Volume I	Cay Horstmann	2019	Prentice Hall
3	Head First Java	Kathy Sierra	2005	O'Reilly
4	Effective Java	Joshua Bloch	2018	Addison-Wesley
5	Java Programming	E. Balagurusamy	2019	McGraw Hill

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Oracle Java Docs	https://oracle.com
2	GeeksforGeeks Java	https://geeksforgeeks.org
3	Coursera Java	https://coursera.org
4	W3Schools Java	https://w3schools.com

Course	Course Code	Course Title	Teaching-	Total	Course
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M.Sc. Artificial Intelligence & Machine Learning Semester-II

Type			Learning Scheme	Notional Hours	credits
			L-P-T		
DSC	P2TNC02AIM04	Systems Analysis, Design, and Engineering	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Demonstrate understanding of system concepts, components, and types of systems such as TPS, MIS, and DSS, along with the phases of the System Development Life Cycle (SDLC).

CLO2: Analyze and apply system design methodologies including prototyping, Functional Decomposition Diagrams (FDD), and Data Flow Diagrams (DFD) for structured system development.

CLO3: Evaluate modern approaches to system development and compare them with classical methodologies for effective system design.

CLO4: Explain the fundamentals of software engineering, including software characteristics, applications, and the need for systematic development processes.

CLO5: Compare and apply different software development process models such as Waterfall, Iterative, and Spiral models in real-world scenarios.

CLO6: Analyze software testing principles and apply various testing techniques including black-box, white-box, alpha, beta, and special system testing to ensure software quality.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	System Analysis and Design -1 The concept of a System, Basic Components, Open and close systems, Examples and categories of the systems such as TPS, MIS, DSS, etc. Phases of the Classical Systems Development Life Cycle (SDLC) Method.	Lecture, Case Study	CLO1
II	System Analysis and Design -2 The Prototype methods, the structured development approach using Functional Decomposition Diagram (FDD), Data Flow Diagram (DFD), Introduction to the Modern Approaches of Systems Development.	Diagram Practice	CLO2
III	Software Engineering – 1 Software, meaning, general characteristics and applications, Software Engineering, meaning, goal and needs, Software Development Process Models, Waterfall, Iterative, Spiral, etc.	Comparative Study	CLO3, CLO4, CLO5
IV	Software Testing Testing, meaning, importance and process, Testing fundamentals, error, fault, bug, failure, test oracles, test, cases and test criteria, Introduction to Black-box (functional) testing and White-box (structural) testing, Alpha testing and Beta testing, Special system tests.	Testing Scenarios	CLO6



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- (*) Learning Pedagogies/Methods**

Notes:

(3) The following list is suggestive. Any other learning pedagogies relevant to discipline-specific requirements can be added.

(4) Acronyms/abbreviations of the terms can be placed in the above table.

(m) Interactive Classroom Lecture

(n) Classroom Lecture (CL)

(o) Seminars (Student-led and Faculty-moderated)

(p) Micro-Projects/Mini Research Tasks

(q) Industrial Visit/Field Visit/Institutional Visit

(r) Problem-Based Learning (PBL)

(s) Research-Oriented Learning (Literature Review, Tool Construction, Data Analysis Exercises)

(t) Collaborative Learning (Group Tasks, Peer Discussion, Joint Presentations)

(u) Experiential Learning (Community Engagement, Internship-linked Activities, Practice-based Tasks)

(v) ICT-Enabled Learning (LMS-based Tasks, Digital Resources, Virtual Labs/Webinars)

(w) Reflective Practices (Learning Journals, Reflective Notes, Concept Mapping)

(x) Self-Directed Learning (Guided Readings, Concept Exploration Tasks)

- Assessment Methodologies**

(A) Internal Assessment

c. Internal Formative assessment (30)

(f) Quiz

(g) Assignment

(h) Seminar/Presentation

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(j) Attendance

d. Internal Summative Assessment (20)

(c) Mid -Term

(B) External Assessment (50)

(d) End-Term

(e)

(B) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
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CLO4	2	2	-	-	-	-	-	2	-	-
CLO5	-	-	3	2	-	-	-	-	-	-
CLO6	-	-	3	2	-	-	-	-	2	-

Values to CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO – PLO correlation	Value
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Moderate	2
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No correlation	-

• Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	System Analysis and Design	Elias Awad	2010	Galgotia
2	Modern Systems Analysis and Design	Jeffrey Whitten	2014	Pearson
3	Software Engineering	Ian Sommerville	2015	Pearson
4	Software Engineering	Roger Pressman	2014	McGraw Hill
5	System Analysis & Design	Dennis & Wixom	2012	Wiley

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	NPTEL Software Engg	https://nptel.ac.in
2	Coursera SDLC	https://coursera.org
3	TutorialsPoint	https://tutorialspoint.com
4	GeeksforGeeks SE	https://geeksforgeeks.org



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

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P2TNC02AIM05	Human Computer Interaction	2-0-0	60	02

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Demonstrate understanding of fundamental concepts of Human-Computer Interaction (HCI), including user interface design, usability principles.

CLO2: Apply design principles and guidelines such as Shneiderman's rules, Norman's principles, Gestalt laws, and Nielsen's heuristics to develop effective and user-friendly interfaces.

CLO3: Analyze human behavior, interaction models (KLM, GOMS, Norman's model), and laws such as Fitts' Law and Hick-Hyman Law to improve interface efficiency and usability.

CLO4: Evaluate the role of logical reasoning, including Nyaya principles, in enhancing secure and effective decision-making in system design and user interaction.

CLO5: Apply usability engineering processes including life cycle models, needs analysis, user profiling, rapid prototyping, and interaction design paradigms (CLI, WIMP, DMI) in system development.

CLO6: Analyze and implement usability evaluation techniques, standards, and modern trends including usability testing, universal design, web usability guidelines, and VR/AR interface design.

Unit	Course Content	Learning Pedagogies*	CO(s)
I	Foundations of HCI & Design Principles Introduction, User Interface Design, Concept of Usability, Usability Principles, HCI and Software Engineering, GUI Design and Aesthetics, Psychological Theories of Human Behaviour, Design Rules for Enhanced Usability, HCI Framework, Introduction to Different Types of Models such as KLM (Keystroke-Level Model) and GOMS Model, Fitts' Law, Hick-Hyman Law, Shneiderman's Eight Golden Rules, Norman's Seven Principles, Gestalt Laws of Design, Norman's Model of Interaction, Nielsen's Ten Heuristics (with examples), User Data Gathering Techniques. Role of logic and reasoning (Nyaya) in secure decision-making.	UI Practice, Case Study	CLO1, CLO2, CLO3, CLO4
II	Usability Engineering, Interaction & Evaluation Usability Engineering, Life Cycle Model, Needs Analysis, Systems Analysis, User Profiling, Rapid Prototyping and Interactive Design, Formative Evaluation Techniques including Usability Testing, Using Standards and Guidelines, Interaction Design Paradigms such as CLI (Command Line Interface), WIMP (Windows, Icons, Menus, Pointer), Form Fillings, Menus, DMI (Direct Manipulation Interface),	Project Work, Testing	CLO5, CLO6



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

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

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

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

	Navigation Design, Dialog Notations and Design, Evaluation Techniques, Universal Design, User Support Systems, Web Usability Guidelines, Recent Trends in VR and AR Design Guidelines.		
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• (*) Learning Pedagogies/Methods

Notes:

(1) The following list is suggestive. Any other learning pedagogies relevant to discipline-specific requirements can be added.

(2) Acronyms/abbreviations of the terms can be placed in the above table.

- Interactive Classroom Lecture
- Classroom Lecture (CL)
- Seminars (Student-led and Faculty-moderated)
- Micro-Projects/Mini Research Tasks
- Industrial Visit/Field Visit/Institutional Visit
- Problem-Based Learning (PBL)
- Research-Oriented Learning (Literature Review, Tool Construction, Data Analysis Exercises)
- Collaborative Learning (Group Tasks, Peer Discussion, Joint Presentations)
- Experiential Learning (Community Engagement, Internship-linked Activities, Practice-based Tasks)
- ICT-Enabled Learning (LMS-based Tasks, Digital Resources, Virtual Labs/Webinars)
- Reflective Practices (Learning Journals, Reflective Notes, Concept Mapping)
- Self-Directed Learning (Guided Readings, Concept Exploration Tasks)

• Assessment Methodologies

(A) Internal Assessment

a. Internal Formative assessment (15)

- Quiz
- Assignment
- Seminar/Presentation
- Group Task
- Attendance

b. Internal Summative Assessment (10)

- Mid -Term

(B) External Assessment (25)

- End-Term

(A) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1, CLO2, CLO3, CLO4	30	1	1	12	14
II	CLO5, CLO6	32	1	1	10	12
		60	02	02	22	26



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

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

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

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

• Assessment and Evaluation

Sr.No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity	50%
2	End-Semester Examination	Written Exam/Practical Exam Project Evaluation (Report, Presentation, Viva)	50%

• CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	-	-	-	-	-	2	-	-
CLO2	-	3	2	-	-	-	-	2	-	-
CLO3	-	2	3	-	-	-	-	-	2	-
CLO4	2	2	-	-	-	-	-	3	-	-
CLO5	-	-	3	2	-	-	-	-	-	-
CLO6	-	-	3	2	-	-	-	-	2	-

Values to CLO-PLO matrix are assigned by judging the importance of the particular CLO in relation to the PLOs.

CLO – PLO correlation	Value
Strong	3
Moderate	2
Low	1
No correlation	-

• Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	Human-Computer Interaction	Alan Dix	2004	Pearson
2	Design of Everyday Things	Don Norman	2013	Basic Books
3	Interaction Design	Sharp, Rogers	2019	Wiley
4	About Face	Alan Cooper	2014	Wiley
5	HCI Handbook	Julie Jacko	2012	CRC Press

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Coursera UX Design	https://coursera.org
2	Nielsen Norman Group	https://nngroup.com
3	Interaction Design Foundation	https://interaction-design.org
4	Google UX Course	https://grow.google



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