

	Akhil Bharatiya Maratha Shikshan Parishad's Anantrao Pawar College of Engineering & Research		
	Record No.: ADM/D/036B Revision: 00	DoI: 01/02/2025	
Internal Correspondence For Department			

Department: AI & DS

CO-PO Mapping

Fourth Year [2019 Pattern] Sem-1

Savitribal Phule Pune University Bachelor of Engineering in Artificial Intelligence and Data Science Program Outcomes (POs)		
Learners are expected to know and be able to-		
PO1	Engineering knowledge	Apply the knowledge of mathematics, science, Engineering fundamentals, and an Engineering specialization to the solution of complex Engineering problems.
PO2	Problem analysis	Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics natural sciences, and Engineering sciences.
PO3	Design / Development of Solutions	Design solutions for complex Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and Environmental considerations.
PO4	Conduct Investigations of Complex Problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
PO5	Modern Tool Usage	Create, select, and apply appropriate techniques, resources, and modern Engineering and IT tools including prediction and modeling to complex Engineering activities with an understanding of the limitations
PO6	The Engineer and Society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and Sustainability	Understand the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the Engineering practice.
PO9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication Skills	Communicate effectively on complex Engineering activities with the Engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project Management and Finance	Demonstrate knowledge and understanding of the Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary Environments.
PO12	Life-long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO)

- PSO1 Professional Skills-**The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexities.
- PSO2 Problem-Solving Skills-** The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.
- PSO3 Successful Career and Entrepreneurship-** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.



Internal Correspondence For Department

417521: Machine Learning

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Describe and compare different models of machine learning

CO2: Design ML models to make predictions by using linear, non-linear and logistic regression techniques

CO3: Implement classification models for two class problems and multiclass problems

CO4: Implement clustering models for unlabeled data

CO5: Integrate multiple machine learning algorithms in the form of ensemble learning

CO6: Apply reinforcement learning and its algorithms for different applications

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	-	-	-	-	-	-	1	-	-	1
CO2	3	3	3	2	3	-	-	-	1	-	-	1
CO3	3	3	3	2	3	-	-	-	1	-	-	1
CO4	3	3	3	2	3	-	-	-	1	-	-	1
CO5	3	3	3	2	3	-	-	-	1	-	-	1
CO6	3	3	3	2	3	-	-	-	1	-	-	1



Internal Correspondence For Department

417522: Data Modeling and Visualization

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Summarize data analysis and visualization in the field of exploratory data science

CO2: Analyze the characteristics and requirements of data and select an appropriate data model

CO3: Describe to load, clean, transform, merge and reshape data

CO4: Design a probabilistic data modeling, interpretation, and analysis

CO5: Evaluate time series data

CO6: Integrate real world data analysis problems

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	-	-	-	-	-	-	-	1
CO2	3	2	2	2	3	3	-	-	-	-	-	1
CO3	3	3	1	2	2	2	-	-	-	-	-	2
CO4	2	2	2	2	3	2	-	-	-	-	-	2
CO5	1	3	2	3	2	-	-	-	-	-	-	2
CO6	-	2	2	2	3	-	-	-	-	-	-	2



Internal Correspondence For Department

Elective III 417523(C): Enterprise Architecture and Components

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Understand the fundamental principles and concepts of enterprise architecture

CO2: Describe how the domains can be managed within the enterprise though a coherent Information Governance framework

CO3: Implement EA Process in Enterprise Architecture Design

CO4: Interpret the component and operational model characteristics of the EA Reference

Architecture

CO5: Analyze strategy for Metadata Management using use case scenarios

CO6: Choose appropriate tool for Enterprise Architecture in Modern Organization

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	-	-	-	-	-	1	-	-	1
CO2	2	2	2	-	1	-	-	-	1	1	-	1
CO3	2	2	2	-	-	-	-	-	1	-	-	1
CO4	2	2	-	-	-	-	-	-	1	-	-	1
CO5	2	2	1	-	-	-	-	-	1	-	-	1
CO6	2	2	1	-	2	-	-	-	1	-	-	1



Internal Correspondence For Department

Elective IV 417524(B): Information Retrieval

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Understand the concept of Information Retrieval

CO2: Use an indexing approach for retrieval of documents

CO3: Evaluate and analyze the retrieved information

CO4: Apply appropriate method of Text Classification and Clustering

CO5: Design and implement innovative features in search engines

CO6: Analyze different real-life application of Information Retrieval

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	-	1	2	-	-	-	-	-	-	-	-	-
CO3	1	2	1	1	1	-	-	-	-	-	-	2
CO4	1	-	1	1	-	-	-	-	1	-	-	1
CO5	1	-	-	-	-	-	-	1	1	-	-	1
CO6	-	-	-	-	1	-	-	-	-	-	-	1



Internal Correspondence For Department

417525: Computer Laboratory I

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Implement regression, classification and clustering models

CO2: Integrate multiple machine learning algorithms in the form of ensemble learning

CO3: Apply reinforcement learning and its algorithms for real world applications

CO4: Analyze the characteristics, requirements of data and select an appropriate data model

CO5: Apply data analysis and visualization techniques in the field of exploratory data science

CO6: Evaluate time series data

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	-	-	-	2	2	1	1
CO2	3	3	3	2	3	-	-	-	2	2	1	1
CO3	3	3	3	2	3	-	-	-	2	2	1	1
CO4	3	2	2	3	3	-	-	-	2	1	1	1
CO5	3	2	2	3	3	-	-	-	2	1	1	1
CO6	3	2	2	3	3	-	-	-	2	2	1	1



Internal Correspondence For Department

417526: Computer Laboratory II: Enterprise Architecture and Components

Course Outcomes:

On completion of the course, learners will be able to–

CO1: Design Enterprise Architecture framework using tools

CO2: Build various reports based on Enterprise Architecture

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	3	1	-	-	1	1	-	3
CO2	2	2	2	-	1	-	-	-	-	-	-	2

417526: Computer Laboratory II: Information Retrieval

Course Outcomes:

CO1: Apply various tools and techniques for information retrieval and web mining

CO2: Evaluate and analyze retrieved information

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	3	2	-	-	-	-	-	-	1
CO2	1	1	2	3	2	-	-	-	-	-	-	1



Internal Correspondence For Department

417527: Project Stage I

Course Outcomes:

On completion of the course, student will be able to–

CO1: Solve real life problems by applying knowledge

CO2: Analyze alternative approaches, apply and use most appropriate one for feasible solution

CO3: Write precise reports and technical documents in a nutshell

CO4: Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work

CO5: Inter-personal relationships, conflict management and leadership quality

417528: MOOC

Course Outcomes:

After completion of the course, learners should be able to–

CO1: To acquire additional knowledge and skill

CO2: Explore new areas of interest in a relevant field



Internal Correspondence For Department

AC7-II: Entrepreneurship Development (Audit Course)

Course Outcomes:

- After completion of the course, learners should be able to-
- CO1: Develop an understanding of startup eco system and entrepreneurial mindset and its significance in the economy
 - CO2: Create a comprehensive business plan by conducting market research, defining target markets, and designing a value proposition
 - CO3: Evaluate different funding sources and develop financial management skills necessary for startup success
 - CO4: Formulate effective marketing strategies and sales techniques to target specific customer segments
 - CO5: Develop leadership and management skills necessary for leading teams and making informed decisions
 - CO6: Apply innovation and product development concepts to create and refine products or services

AC7-IV: Foreign Language (Audit Course)

Course Outcomes:

- After completion of the course, learners-
- CO1: Will have the ability of basic communication
 - CO2: Will have the knowledge of Language script
 - CO3: Will get introduced to reading, writing and listening skills
 - CO4: Will develop interest to pursue profession in Foreign Industry



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Internal Correspondence For Department

Fourth Year [2019 Pattern] Sem-2

417530: Computational Intelligence

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Understand Computational Intelligence techniques to solve real-life problems

CO2: Apply fuzzy logic techniques to solve real life problems

CO3: Design and implement evolutionary algorithms to solve optimization problem

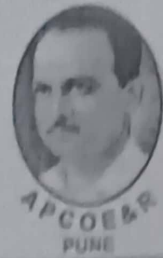
CO4: Analyze and evaluate the performance of genetic algorithms in terms of convergence and Computational efficiency

CO5: Interpret and analyze the results obtained from computational intelligence models in NLP, providing meaningful insights and recommendations

CO6: Design and Develop Artificial Immune System to solve complex problems

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	-	-	-	-	-	-	-	-
CO2	3	2	2	2	1	-	-	-	-	-	-	-
CO3	2	2	3	2	-	-	-	-	-	-	-	-
CO4	2	3	3	2	-	-	-	-	-	-	-	-
CO5	2	2	2	2	1	1	-	-	-	-	-	-
CO6	2	2	3	2	1	1	-	-	-	1	-	1
												1



Internal Correspondence For Department

417531: Distributed Computing

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Understand the features and properties of Distributed computing system with integration of AI

CO2: Analyze the Concept of data management and storage in distributed computing

CO3: Understand the algorithm used in distributed computing by applying artificial intelligence

CO4: Understand the integration of machine learning algorithm and advanced tools used in distributed computing

CO5: Analyze how big data is processed in distributed computing

CO6: Identify Security and privacy issues of distributed computing and apply on specific application

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	1	1	-	-	-	-	-	-	1	-
CO2	1	-	1	2	-	-	-	-	-	-	-	-
CO3	-	-	1	1	-	-	-	-	-	-	1	-
CO4	2	-	2	1	1	-	-	-	-	-	1	-
CO5	1	-	1	2	2	-	-	-	-	-	-	-
CO6	1	-	2	2	3	-	-	-	-	-	1	-



Internal Correspondence For Department

Elective V 417532(D): Deep Learning

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Understand the basics of Deep Learning and apply the tools to implement deep learning applications

CO2: Evaluate the performance of deep learning models

CO3: Implement the technique of Convolution neural network (CNN)

CO4: Solve the language translation problem by Recurrent neural network (RNN)

CO5: Construct new data by deep generative models

CO6: Apply on-policy reinforcement learning algorithms

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	-	-	-	-	-	-	2
CO2	3	2	2	2	2	-	-	-	-	-	-	1
CO3	3	2	2	2	2	-	-	-	-	-	-	1
CO4	2	2	2	2	2	-	-	-	-	-	-	1
CO5	2	2	3	2	2	-	-	-	-	-	-	1
CO6	2	2	2	2	2	-	-	-	-	-	-	1



Internal Correspondence For Department

Elective VI 417533(B): Business Intelligence

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Apply conceptual knowledge on how BI is used in decision support systems

CO2: Use Modelling Concepts in Business Intelligence

CO3: Understand and apply the concept of data provisioning and data Visualization

CO4: Apply different data pre-processing techniques on data set

CO5: Implement machine learning algorithms as per business needs

CO6: Identify role of BI in Management, Inventory, Production, Logistics and Management

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	2	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	3	-	-	-	-	-	-	-
CO3	-	2	2	2	3	-	-	-	-	-	-	-
CO4	-	3	-	-	3	-	-	-	-	-	-	-
CO5	-	3	3	2	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	2	-	2	-	-	2	-



Internal Correspondence For Department

417534: Computer Laboratory III

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Apply the principles on which the internet and other distributed systems are based

CO2: Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving

CO3: Apply fuzzy logic techniques to model and solve problems

CO4: Design and implement evolutionary algorithms to solve optimization and search problems in diverse domains

CO5: Design and implement artificial immune system algorithms to solve complex problems in different domains

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	1	1	2	-	-	-	-	-	1	-
CO2	2	1	1	2	2	-	-	-	-	-	-	-
CO3	1	2	-	1	2	-	-	-	-	-	1	-
CO4	1		1	2	1	-	-	-	-	-	-	-
CO5	1	2	1	1	2	-	-	-	-	-	1	-



Internal Correspondence For Department

417535: Computer Laboratory IV (Deep Learning + Business Intelligence)

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Apply basic principles of elective subjects to problem solving and modeling

CO2: Use tools and techniques in area of software development to build mini projects

CO3: Design and develop applications on subjects of their choice

CO4: Implement and manage deployment, administration & security

The CO-PO Mapping Matrix

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	2	-	-	-	-	-	-	1
CO2	-	2	-	-	-	-	-	-	-	-	-	1
CO3	-	-	-	2	-	-	-	-	2	-	-	1
CO4	3	2	2	2	-	-	-	-	-	-	-	1



Internal Correspondence For Department

417536: Project Stage II

Course Outcomes:

After completion of the course, learners should be able to-

CO1: Show evidence of independent investigation

CO2: Critically analyze the results and their interpretation

CO3: Report and present the original results in an orderly way and placing the open questions in the right perspective

CO4: Link techniques and results from literature as well as actual research and future research lines with the research

CO5: Appreciate practical implications and constraints of the specialist subject

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10/7/2026

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