

**DEPARTMENT OF COMPUTER SCIENCE WITH ARTIFICIAL
INTELLIGENCE & MACHINE LEARNING**

**Nallamuthu Gounder Mahalingam College
(Autonomous)
(An ISO 9001:2015 Certified Institution)
Re-Accredited with 'B' Grade by NAAC
Pollachi-642001**



SYLLABUS

**B.Sc. COMPUTER SCIENCE WITH ARTIFICIAL INTELLIGENCE &
MACHINE LEARNING**

BATCH 2022-2025

Program Educational Objectives (PEOs)	
The B.Sc. Computer Science with Artificial Intelligence & Machine Learning program describe accomplishments that graduates are expected to attain within five to seven years after graduation.	
PEO1	Expertise with the principles of Artificial Intelligence and problem solving, inference, perception, knowledge representation, and learning
PEO2	Exhibit high standards with regard to application of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning and deep learning models
PEO3	Investigate with a machine learning model for simulation and analysis and explore the scope, potential, limitations, and implications of intelligent systems.
PEO4	Establish the ability to Listen, read, proficiently communicate and articulate complex ideas with respect to the needs and abilities of diverse audiences.
PEO5	Instill key technologies in Artificial Intelligence, Machine Learning and deep learning, visualization techniques, Natural language processing and Robotics.

Programme Outcomes (POs)	
On successful completion of the B.Sc. Computer Science with Artificial Intelligence & Machine Learning	
PO1	Domain Knowledge: Demonstrate a sound understanding of all the main areas of Machine Learning & AI and also demonstrate the ability to exercise critical judgement in the evaluation of Machine Learning and AI applications.
PO2	Problem Analysis: Understand how to distill a real-world challenge as an artificial intelligence problem, involving explicit representation and learning of symbolic and numeric models; reasoning about such models; and using such models for decision making, action selection, and interaction with humans.
PO3	Design/development of solutions: Design and develop research-based solutions for complex problems in artificial intelligence and machine learning industry through appropriate consideration for the public health, safety, cultural, societal, and environmental concerns.
PO4	Communicative & oratorical Skills: Establish the ability to Listen, read, proficiently communicate and articulate complex ideas with respect to the needs and abilities of diverse audiences.

PO5	Exhibit Entrepreneurial Skills: Deliver innovative ideas to instigate new business ventures and possess the qualities of a good entrepreneur
PO6	Ethics: Recognize the social impact of artificial intelligence and the underlying responsibility to consider the ethical, privacy, moral, and legal implications of artificial intelligence technologies.
PO7	Individual and teamwork: Graduates will be able to undertake any responsibility as an individual/member of multidisciplinary teams and have an understanding of team leadership
PO8	Use of State-of-the-Art AI and machine learning tools & techniques: Design, analyze, implement, and use state-of-the-art AI and machine learning tools & techniques for dealing with real-world data, including data involving vision, language, perception, and uncertainty.
PO9	Dynamism and 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.
PO10	Research instinct: Apply AI and ML specific research techniques, tools, methods, design of experiments, analysis and synthesis of the information for conducting investigations of complex problems.

Program Specific Outcomes (PSOs)	
After the successful completion of B.Sc. Computer Science with Artificial Intelligence and Machine Learning program, the students are expected to	
PSO1	Exhibit good domain knowledge and completes the assigned responsibilities effectively and efficiently in par with the expected quality standards for Artificial Intelligence and Machine Learning professional.
PSO2	Apply the technical and critical thinking skills in the discipline of artificial intelligence and machine learning to find solutions for complex problems. Design and develop research-based solutions for complex problems in artificial intelligence and machine learning industry through appropriate consideration for the public health, safety, cultural, societal, and environmental concerns.

PEOs POs \ PSOs	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	H	H	H	L	L
PO2	H	H	H	L	L
PO3	H	H	H	H	L
PO4	L	M	M	M	L
PO5	M	M	M	H	M
PO6	L	L	M	H	L
PO7	M	M	M	H	M
PO8	L	L	L	H	M
PO9	M	M	M	H	L
PO10	M	M	M	M	L
PSO1	H	H	H	M	L
PSO2	H	H	H	H	M

Programme Code:	B.Sc			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI101			Title	Batch:	2022 - 2025	
LectureHrs ./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem	60	Core I: Java Programming	Semester:	I	
					Credits:	4	

Course Objective

The course provides insight knowledge about object oriented programming concepts and programming language in Java.

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Develop an in-depth understanding of object-oriented programming concepts	K1
CO2	Explain the various programming language constructs, object oriented concepts like overloading, inheritance, polymorphism, Interfaces, threads, exception handling and packages	K2
CO3	Illustrate the concepts of Applets, files and the concept of stream classes.	K3
CO4	Outline the benefits and applications of objects oriented programming concepts and defend how JAVA differs from other programming languages	K4
CO5	Judge the pros and cons of other object oriented language with the concepts of Java	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	H
CO2	H	H	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	L	M	H
CO4	M	H	M	H	M	L	H	L	M	L	M	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI102			Title	Batch:	2022 - 2025	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem	60	Core II: Industry 4.0	Semester:	I	
					Credits:	4	

Course Objective

To impart knowledge on Industry 4.0, need for digital transformation and the following Industry 4.0 tools: 1. Artificial Intelligence 2. Big Data and Data Analytics 3. Internet of Things

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Know the reason for adopting Industry 4.0 and Artificial Intelligence.	K1
CO2	Understand the need for digital transformation.	K2
CO3	Apply the industry 4.0 tools.	K3
CO4	Analyze the applications of Big Data.	K4
CO5	Examine the applications and security of IoT Applications.	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	H	H	H	H	L	M	L	H	L	H	H
CO3	M	M	M	H	M	L	M	M	M	L	H	H
CO4	M	H	M	H	M	L	H	L	M	L	H	L
CO5	H	M	H	H	L	L	M	L	M	H	H	M

Programme Code:	B.Sc,			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI1A1			Title	Batch:	2022 – 2025	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem	60	Allied I :Introduction to Linear Algebra	Semester:	I	
					Credits:	4	

Course Objective

To introduce the concepts of Numbers, Quantification, sets, logical reasoning, probability and calculus

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define basic terms and concepts of matrices.	K1
CO2	Comprehend the use of various matrix operations	K2
CO3	Understand the concept of Vector spaces and Basis	K3
CO4	Determine Eigen values and Eigen Vectors	K4
CO5	Determine orthogonal set concept	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	M
CO3	M	H	M	H	M	M	H	M	M	L	H	H
CO4	M	H	M	H	M	L	H	L	M	L	H	M
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc			Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI103			Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	75	Core Lab I Programming Lab in Java	Semester:	I
					Credits:	2

Course Objective

- To make the student learn an object oriented way of solving problems using java.
- To make the students to write programs using multithreading concepts and handle exceptions.
- To make the students to write programs that connects to a database and be able to perform various front-end operations.

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember and recollect the object oriented concepts	K3
CO2	To get the idea of packages, interfaces and exceptions and AWT	K4
CO3	To validate the projects using front-end and back-end programming	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI204			Title	Batch:	2022 - 2025	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	60	Core III: Programming in Python	Semester:	II	
					Credits:	4	

Course Objective

To impart knowledge in Core python, advanced concepts like Regular Expressions and Artificial Intelligence & Data Science tools which allow students to apply the concepts to become effective Python programmers.

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the core programming constructs of Python	K1
CO2	Express proficiency in the handling of functions, strings, lists, dictionaries, tuples and sets	K2
CO3	Apply the use of regular expressions and built-in functions to navigate the file system.	K3
CO4	Illustration of Object-oriented Programming concepts in Python	K4
CO5	Realize the power of modules like NumPy, pandas, and Altair in developing solutions to problems related to data science	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	M	H	H
CO4	M	L	M	H	H	L	H	L	M	L	H	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI205		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	60	Core IV:	Semester:
				Data Structures and Algorithms	II
				Credits:	4

Course Objective

- To introduce the concept of data structures and the types of data structures
- To demonstrate how various data structures can be implemented and used in various applications

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Define the concept of Data structure and list the various classifications of data structures.	K1
CO2	Demonstrate how arrays, stacks, queues, linked lists, trees, heaps, Graphs and Hash Tables are represented in the main memory and various operations are performed on those data structures.	K2
CO3	Illustrate the various file organizations like Sequential, Random and Linked organizations.	K3
CO4	Discover the real time applications of the various data structures	K4
CO5	Design algorithms for various sorting and searching techniques	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	M
CO3	M	H	M	H	H	L	M	M	M	H	H	H
CO4	L	L	M	H	H	L	H	L	M	L	H	M
CO5	H	M	H	H	M	L	L	L	M	H	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UDA2A1		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	ALLIED II: Optimization Techniques	Semester:	II
		60		Credits:	4

Course Objective

- To model linear programs and solving with a computer
- To use Simplex algorithms to solve linear programs & Other algorithms for linear programming,
- To introduce Integer Programming
- To Solve Network problems & Non-linear programming

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic principles and practices of computing grounded in mathematics and science	K1
CO2	To understand the Problems using various linear Algorithms	K2
CO3	To apply algorithms to the decision making problems	K3
CO4	To analyze the programming algorithms with exercises	K4
CO5	To Summarize the inventory and queuing models	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	L	H	M	L	L	L	M	M	H	H
CO2	H	L	H	H	H	L	M	L	M	L	H	M
CO3	M	H	M	H	H	L	M	M	M	H	H	H
CO4	L	L	M	H	H	L	H	L	H	L	H	L
CO5	H	M	H	H	M	H	L	L	H	H	H	H

Programme Code:	B.Sc			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI206			Title	Batch:	2022 - 2025	
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	75	Core Lab II Programming Lab in Python	Semester:	II	
					Credits:	2	

Course Objective

To give a basic introduction to object-oriented and to demonstrate the concepts of Artificial Intelligence and Data science, using Python

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the principles of structured programming Recognize and construct common programming idioms: variables, loop, branch, subroutine, and input/output.	K3
CO2	To understand the common programming idioms: variables, loop, branch, subroutine, and input/output	K4
CO3	To figure out ability to analyze and solve the problems using advanced facilities of the Python language	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

B.Sc Computer Science with AI & ML Effective from the year 2022 onwards

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI207		Title	Batch:	2022 – 2025
			Capstone Project - 1	Semester:	II
Lecture Hrs./Week or Practical Hrs./Week	Tutorial Hrs./Sem.			Credits:	2

Programme Code:	B.Sc.			Programme Title:	Bachelor of Science (Computer Science with AI & ML)		
Course Code:	22UAI308			Title	Batch:	2022 – 2025	
				Database Systems Concepts	Semester:	III	
Lecture Hrs./Week or Practical rs./Week	5	Tutorial Hrs./Sem.	5		Credits:	4	

Course Objectives

This course has been designed for students to learn and understand

- To the foundations of database management systems.
- To give a good formal foundation on the relational model of data.
- To use the database management systems in various real-time applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the foundations of database systems.	K2
CO2	Demonstrate the basics of SQL for database	K3
CO3	Execute various advanced SQL queries.	K4
CO4	Apply various normalization techniques on databases.	K4
CO5	Apply and relate the concept of transaction, concurrency control and recovery in database.	K5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	M	H	H
CO4	M	L	M	H	H	L	H	L	M	L	H	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI309		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	5	Introduction to AI	Semester:
					III
				Credits:	4

Course Objectives

To introduce the basic concepts of artificial intelligence and techniques of Machine Learning.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic principles and practices of Typical AI Problems	K1
CO2	To understand problem solving using search strategies and Game playing	K2
CO3	To Choose the suitable machine learning methods/algorithms for various type of learning problems	K3
CO4	To Analyse the Knowledge representation techniques	K4
CO5	To Apply appropriate Linear models to different contexts	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	M	H	H
CO4	M	L	M	H	H	L	H	L	M	L	H	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI3A1		Title	Batch:	2022 - 2025
			General Elective 3: Discrete Structures and its Applications	Semester:	III
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.		5	Credits:

Course Objectives

- Introduce students to the techniques, algorithms, and reasoning processes involved in the study of discrete mathematical structures.
- Introduce students to set theory, inductive reasoning, elementary and advanced counting techniques, equivalence relations, recurrence relations, graphs, and trees.
- Introduce students to prove mathematical statements by means of inductive reasoning

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand discrete mathematical preliminaries and apply discrete mathematics in formal representation of various computing constructs	K1
CO2	Demonstrate an understanding of relations, functions, Combinatorics and lattices	K2
CO3	Apply the techniques of discrete structures and logical reasoning to solve a variety of problems and write an argument using logical notation	K3
CO4	Analyze and construct mathematical arguments that relate to the study of discrete structures	K4
CO5	Analyze and construct mathematical arguments that relate to the study of discrete structures	K5

Programme Code:	B.Sc.			Programme Title:	AI and ML	
Course Code:	22UAI310			Title	Batch:	
				Title	Semester:	III
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	5	Core Lab III : RDBMS Lab	Credits:	2

Course Objective

To make the students to work with relational, Structured and unstructured Databases like SQL, NoSQL and Mongo DB

Course Outcomes

On the successful completion of the course, students will be able to

CO1	To remember the principles of relational databases.	K3
CO2	To understand the common constructs of relational databases to formulate queries	K4
CO3	To figure out ability to analyze and solve the problems using advanced facilities of SQL	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc.			Programme Title:	AI and ML		
Course Code:	22UAI311			Title	Batch:		
				Title	Semester:	III	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	5	Core Lab IV : AI Lab	Credits:	2	

Course Objective

To make the students to work with relational AI Concepts

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To Understand the Typical AI problems	K3
CO2	To Analyze the search strategies	K4
CO3	To implement the Typical problems in AI	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI3N1		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	Non-Major Elective Paper-I :	Semester:	III
			Internet Concepts	Credits:	2

Course Objectives

To give the confidence for the students to build a customized Web Page

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To Understand the basic internet concepts	K3
CO2	To analyze the Tags required to build a webpage and using the CSS	K4
CO3	To implement the Web Pages	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI3N2		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	Non-Major Elective Paper-I : Data Processing Through Excel Lab	Semester:	III
				Credits:	2

Course Objectives

To ease the data processing operations by using Excel

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To understand the basics of Excel	K3
CO2	To analyze the use of Excel in Data Processing	K4
CO3	To implement the Data Processing concepts in Excel	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI412		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	Cloud Computing	Semester:	III
				Credits:	4

Course Objectives

- To understand the concepts in Cloud Computing and its Security
- To understand the evolving computer model, cloud computing.
- To introduce the various levels of services that can be achieved by cloud.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic concepts of Cloud computing	K1
CO2	To understand levels of services of Cloud	K2
CO3	To explain and apply Concepts of Cloud	K3
CO4	To Analyze the security aspects in the cloud	K4
CO5	To Apply appropriate Linear models to different contexts	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	M	H	H
CO4	M	L	M	H	H	L	H	L	M	L	H	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc.			Programme Title:	AI and ML	
Course Code:	22UAI413			Title	Batch:	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	5	Title: Core Introduction to Machine Learning	Semester:	IV
					Credits:	5

Course Objective

- To understand basic concepts of machine learning
- Understand how to evaluate models generated from data
- Discover how to build machine learning algorithms, prepare data, and use different techniques using Python

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the concept of Machine learning techniques and mathematical concepts in ML	K1
CO2	Understand a wide variety of learning algorithms.	K2
CO3	Understand how to evaluate models generated from data	K3
CO4	Provide a way to evaluate performance of machine learning algorithms.	K3
CO5	Apply the algorithms to a real-world problem and optimize the models learned.	K4

Mapping

PO /PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	H	M	M	M	L	L	L	L	H	M
CO2	M	L	L	L	M	H	M	M	M	M	H	H
CO3	S	M	L	L	L	L	L	L	L	L	L	H
CO4	S	M	L	L	L	M	L	L	L	L	H	L
CO5	M	M	L	H	M	H	M	M	M	M	M	H

Programme Code:	B.Sc.			Programme Title:	AI and ML	
Course Code:	22UAI4A1			Title	Batch:	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	5	Title: General Elective 4: Mathematics for ML	Semester:	IV
					Credits:	4

Course Objective

This course provides basics for understanding concept of statistics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.	K1
CO2	Understanding of the strengths and weaknesses of many popular machine learning approaches.	K2
CO3	Understand the concepts of computational learning theory and Sample data	K3
CO4	Appreciate the underlying the concept of NFA	K4
CO5	Apply the algorithms to a real-world problem, optimize the models learned.	K5

Mapping

PO /PSO/CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	H	M	M	M	L	L	L	L	H	M
CO2	M	L	L	L	M	H	M	M	M	M	L	H
CO3	S	M	L	L	L	L	L	L	L	L	H	L
CO4	S	M	L	L	L	M	L	L	L	L	L	M
CO5	M	M	L	H	M	H	M	M	M	M	H	H

Programme Code:	B.Sc.			Programme Title:	AI and ML	
Course Code:	22UAI414			Title	Batch:	
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	5	Title MACHINE LEARNING LAB	Semester:	IV
					Credits:	2

Course Objective

To focus on the Machine learning Techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts and techniques of Machine Learning.	K3
CO2	Explain the regression methods, classification methods, clustering methods.	K4
CO3	Demonstrate Dimensionality reduction Techniques	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc.			Programme Title:	AI and ML	
Course Code:	22UAI415			Title	Batch:	
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.		Title	Semester:	IV
				Capstone Project II	Credits:	2

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	23UAI205		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	2	Tutorial Hrs./Sem.	Block chain Technology	Semester:	IV
				Credits:	2

Course Objectives

To introduce the basic concepts of artificial intelligence and techniques of Machine Learning.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Blockchain technology.	K1
CO2	Identify the working of blockchain	K2
CO3	Describe the Technology Stack for Blockchain	K3
CO4	Discuss the Network component of Block Chain	K4
CO5	Analyse and implement the use cases of Blockchain	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	M	L	M	L	M	M	H	M
CO2	H	L	H	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	L	M	M	M	M	H	H
CO4	M	L	M	H	H	L	H	L	M	L	H	H
CO5	H	M	H	H	L	L	M	L	M	H	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI4N1		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	Non-Major	Semester:	IV
			Elective Paper-II : Web Technology Lab	Credits:	2

Course Objectives

The objectives of this course are to have a practical understanding about how to write PHP code to solve problems.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain knowledge and develop application programs using PHP	K3
CO2	Create dynamic Web applications such as content management, user registration, and e-commerce using PHP and to understand the ability to post and publish a PHP website.	K4
CO3	Develop a MySQL database and establish connectivity using MySQL.	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H

Programme Code:	B.Sc		Programme Title:	Bachelor of Science (Computer Science with AI & ML)	
Course Code:	22UAI4N1		Title	Batch:	2022 - 2025
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	Non-Major	Semester:	IV
			Elective Paper-II : Web Application Using Photoshop	Credits:	2

Course Objectives

The objectives of this course are to have a practical understanding about how to build web Application using Photoshop

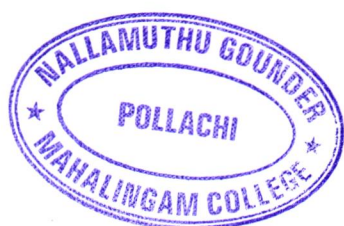
Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain knowledge and develop Web Application using Photoshop	K3
CO2	Create dynamic Web applications using Photoshop	K4
CO3	Develop a Web page and build hybrid web application employing Photoshop	K5

Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	M	L	M	L	M	M	H	H
CO2	H	M	M	H	H	L	M	L	M	L	H	H
CO3	M	H	M	H	M	M	H	M	M	L	H	H



(Signature)
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