

A Unique Approach for
a professional

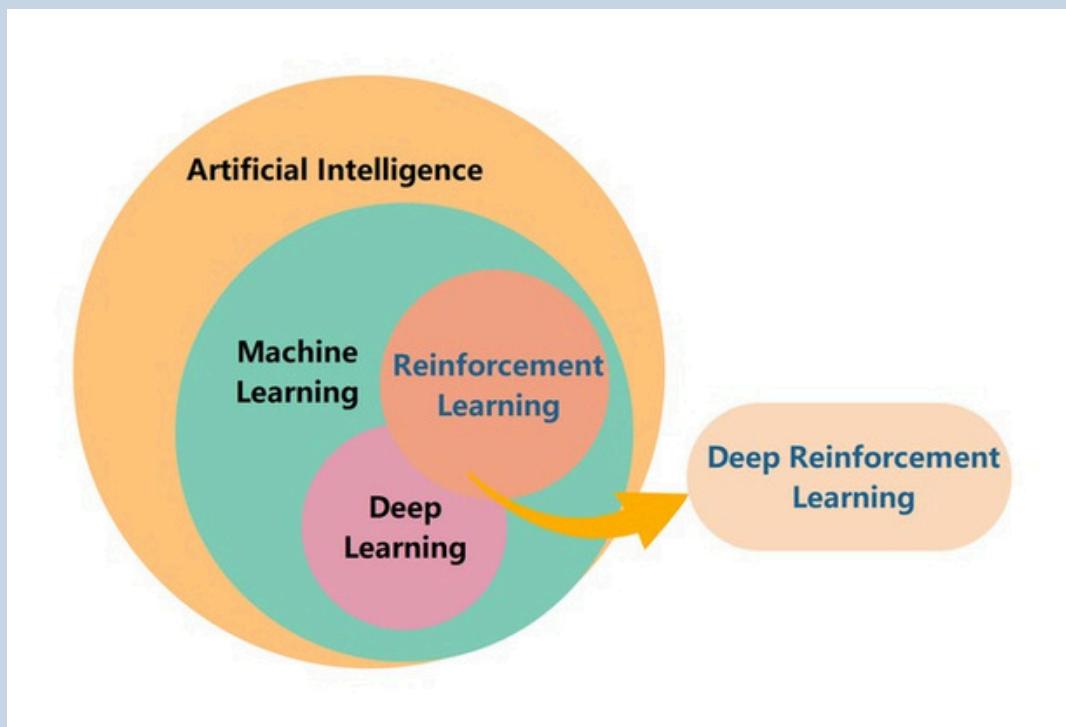
Diving into AI



COURSE INTRODUCTION

Machine Learning (ML), Deep Learning (DL), and Reinforcement Learning (RL) are powerful and widely used technologies that form the core of modern artificial intelligence systems. Machine Learning focuses on enabling computers to learn from data and make predictions or decisions, while Deep Learning uses multi-layer neural networks to model complex patterns in large datasets such as images, text, and speech. Reinforcement Learning allows intelligent agents to learn optimal actions through interaction with an environment by maximizing rewards. Together, these three paradigms provide a complete framework for building intelligent, adaptive, and scalable AI solutions.

This course offers an in-depth overview of ML, DL, and RL, including how to design, train, and deploy intelligent models from scratch. Students will learn key concepts, algorithms, and practical implementation techniques, as well as how to integrate these approaches into a unified learning pipeline. They will gain hands-on experience through real-world projects and applications, developing practical skills in data processing, model training, and evaluation. By the end of the course, students will be well-equipped to build high-quality AI systems and pursue advanced roles in artificial intelligence and data science.



IMPORTANCE OF LEARNING MACHINE LEARNING, DEEP LEARNING, AND REINFORCEMENT LEARNING TODAY

Machine Learning, Deep Learning, and Reinforcement Learning are at the core of today's data-driven and AI-powered technologies. These approaches enable systems to learn from data, adapt to new situations, and make intelligent decisions, making them ideal for modern, cloud-based, and real-time applications. They are scalable, cost-effective, and capable of solving complex problems across industries such as healthcare, finance, automation, and autonomous systems.

ML, DL, and RL are essential for building intelligent applications, predictive systems, and self-learning models. Skilled professionals in these areas are in high demand as organizations increasingly adopt artificial intelligence to drive innovation and efficiency. Our syllabus is carefully designed to reflect the latest industry trends and technological advancements, offering a streamlined learning path that makes you AI-ready in a short time.

ELIGIBILITY/ WHO IS THIS FOR?

- For beginners and freshers entering the field of Artificial Intelligence and Data Science.
- For students or professionals interested in learning Machine Learning, Deep Learning, and Reinforcement Learning.
- Basic programming knowledge is helpful but not mandatory

WHY SHOULD YOU LEARN THIS COURSE AT **YugantaAI?**

- placement assistance.
- Specialized grooming sessions.



SYLLABUS

MACHINE LEARNING

SECTION 1: INTRO TO ML

- What is ML? Types
- of ML Supervised
- learning
- Unsupervised
- learning
- Applications of ML

SECTION 2: PREPROCESSING DATA

- Dealing With Missing values
- Replacing Missing values
- Imputing Missing Values
- Working with Categorical variables
- Working with outliers

SECTION 3: REGRESSION and TYPES OF REGRESSION

- Linear Regression
- Multiple Linear Regression
- Polyimal Regression

SECTION 4:BUILDING KNN MODEL

- Intro to K-nearest neighbours
- Building a knn model
- Determining the right k-value
- How to calculate distance
- Implementing k-nearest neighbours

SECTION 5:DECISION TREE

- What is Decision Tree
- Types of Decision Tree
- Information Gain and Gini Index
- How Decision Tree works
- Applications of Decision Tree

SECTION 6: RANDOM FOREST

- What is Random Forest?
- Applications of Random Forest
- Important Features
- Advantages and Disadvantages

SECTION 7: CLUSTERING

- What is Clustering?
- Clustering Algorithms
- Applications

DEEP LEARNING

SECTION 1: DEEP FEED FORWARD NEURAL NETWORK

- Multilayer Perceptron
- Gradient Descent
- Back Propagation computation in fully connected MLP
- Activation Functions
- Error Functions

SECTION 2: REGULARIZATION

- L1,L2 Regularization
- Data Agumentation
- DropOut
- Early Stopping

SECTION 3: CONVOLUTIONAL NEURAL NETWORK

- Convolutional Operations
- Pooling
- Batch Normalization

SECTION 4: RECURRENT NEURAL NETWORK

- RNN
- Bidirectional RNN
- LSTM
- GRU

SECTION 5 : OPTIMIZATION FOR DEEP LEARNING

- Gradient Descent
- Stochastic Gradient Descent
- Mini batch gradient Descent

REINFORCEMENT LEARNING

SECTION 1: MARKOV DECISION PROCESS

- Policy and Value Function
- Bellman Equations

SECTION 2: DYNAMIC PROGRAMMING

- Dynamic Programming
- Policy Evaluation and Policy Iteration
- Value Iteration



SECTION 3: MONTE CARLO AND TEMPORAL DIFFERENCE

- Monte carlo prediction
- TD prediction

SECTION 4: MODEL FREE CONTROL

- Generalized Policy Iteration
- SARSA
- Q-Learning

SECTION 5: PROXIMAL POLICY ITERATION AND DDPG

- Deep Deterministic policy gradient
- Proximal policy iteration

SECTION 6: RLHF AND DPO

- What is RLHF?
- What is DPO

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