Ai

1. Introduction to Artificial Intelligence and Machine Learning

Definition and scope of AI and ML.

Historical overview and evolution of AI.

Applications of AI and ML in various fields.

2. Foundations of AI

Search algorithms: Breadth-first search, depth-first search, heuristic search (A*, etc.).

Problem-solving methods: Uninformed search, informed search, constraint satisfaction problems.

Knowledge representation: Propositional logic, first-order logic, semantic networks, ontologies.

Planning and decision making: Classical planning, reinforcement learning, Markov decision processes.

3. Machine Learning Basics

Introduction to supervised learning, unsupervised learning, and reinforcement learning.

Types of ML algorithms: Regression, classification, clustering, dimensionality reduction.

Evaluation metrics: Accuracy, precision, recall, F1-score, confusion matrix.

Model selection and validation: Cross-validation, hyperparameter tuning, bias-variance tradeoff.

4. Supervised Learning Algorithms

Linear regression.

Logistic regression.

Support Vector Machines (SVM).

Decision Trees and Random Forests.

Naïve Bayes classifiers.

Neural networks and deep learning basics.

5. Unsupervised Learning Algorithms

K-means clustering.

Hierarchical clustering.

Principal Component Analysis (PCA).

Association rule learning (Apriori algorithm).

Density-based clustering (DBSCAN).

6. Advanced Topics in AI and ML

Natural Language Processing (NLP) and text mining.

Computer Vision and image recognition.

Reinforcement Learning algorithms: Q-learning, Deep Q Networks (DQN), Policy Gradient methods.

Generative Adversarial Networks (GANs).

Time-series analysis and forecasting.

7. Ethical and Societal Implications of AI

Bias and fairness in AI systems.

Privacy and security concerns.

AI ethics and responsible AI development.

Legal and regulatory considerations.

8. Hands-on Projects and Practical Applications

Implementation of ML algorithms using Python libraries such as scikit-learn, TensorFlow, and Keras.

Real-world case studies and projects in various domains like healthcare, finance, and robotics.

Conclusion:

In conclusion, the AI and Machine Learning syllabus provides a comprehensive overview of the foundational principles, algorithms, and applications in the field of artificial intelligence and machine learning. Through a structured curriculum, students gain a deep understanding of various topics, including search algorithms, knowledge representation, supervised and unsupervised learning, deep learning, and ethical considerations.

100% Job Oriented Data Science Masters Program Syllabus

Week 1

Python

- ❖ Introduction to Data Science and Python basics
- ❖ Python Variables, Operators and Data Types
- ❖ Control Statements
- ❖ Functions
- ❖ Modules and Packages
- ❖ File Handling

Week 2 & 3

Data Manipulation and Cleaning

- ❖ Introduction to Numpy lib
- ❖ Numpy functions
- ❖ Introduction to Pandas
- ❖ Data Loading and Reading
- ❖ Data Cleaning and Preprocessing
- ❖ Data Transformation and Feature
- ❖ Engineering

Week 4

Exploratory Data Analysis (EDA)

- ❖ Importance of EDA in Data Science
- ❖ Data Visualization Library – Matplotlib

❖ Data Visualization Library – Seaborn

❖ Introduction to Web Scraping

Week 5 & 6

Machine Learning

❖ Supervised vs. Unsupervised Learning and RL

❖ Supervised Machine Learning Techniques

❖ Data Pre-processing Techniques

❖ Testing and Training Data

❖ Linear Regression

Week 7

Classification Algorithms

❖ Logistic Regression

❖ Decision Tree

❖ Random Forest

❖ Naïve Bayes Classification

❖ K Nearest Neighbor

❖ Support Vector Machine

Week 8

Natural Language Processing

❖ Text Preprocessing and Tokenization

❖ Sentiment Analysis

❖ Text Classification

Week 9

Unsupervised Machine Learning techniques

❖ Unsupervised Learning Using Clustering

❖ K Means Clustering

Week 10,11 & 12

Deep Learning

❖ Introduction to Deep Learning

❖ Introduction to Neural Networks

❖ Single Layer Perceptron

❖ Multilayer Perceptron (MLP)

❖ Introduction to TensorFlow

❖ Understanding CNN

❖ Image Recognition

❖ Introduction to RNN

❖ LSTM – Long Short-Term Memory Networks

❖ Introduction to Reinforcement Learning (RL)

Week 13

Data Visualization (Tableau or Power BI)

100% Job Oriented Cloud & DevOps Masters Program Syllabus

Week 1

Linux

- ❖ Introduction to Linux
- ❖ Linux Distribution and Shell
- ❖ Basic Linux Commands
- ❖ Advanced Linux Commands
- ❖ Package Management in Linux
- ❖ Permissions Linux for Cloud and DevOps
- ❖ Process Management
- ❖ Basics of Networking
- ❖ Network Protocol

Week 2

Amazon Web Services

- ❖ Introduction to Cloud Computing
- ❖ Service and Deployment Model
- ❖ Introduction to AWS
- ❖ Global Infrastructure and Services
- ❖ Identity and Access Management (IAM)
- ❖ IAM Roles and Policies
- ❖ IAM Best Practices

Week 3

❖ Developing Cloud Solutions using AWS

❖ Snapshots

❖ Storage Options

❖ Content Delivery Network (CDN)

❖ Storage Gateway and Windows File Server

❖ Elastic Load Balancing

❖ Network Load Balancer

Week 4

❖ Application Load Balancer

❖ AWS Auto Scaling

❖ Lifecycle of Auto Scaling

❖ Route 53

❖ Database Services and Relational Database Services

❖ Amazon DynamoDB

❖ Amazon ElasticCache

Week 5

❖ Amazon Redshift

❖ Configure Virtual Private Cloud

❖ Cloud Monitoring Services and CloudWatch

❖ Amazon CloudWatch Events and Logs

❖ AWS CloudTrail

❖ Application Services: Simple Email Services (SES)

❖ AWS Simple Notification Services (SNS)

Week 6

❖ Amazon EventBridge

❖ AWS Lambda

❖ Security

❖ AWS Cognito and Web Application Firewall (WAF)

❖ AWS Shield and AWS GuardDuty

❖ Data Protection and Trusted Advisor

❖ Security and Billing

Week 7

❖ Cloud Analytics and Amazon Athena

❖ Amazon Elastic MapReduce (EMR)

❖ Amazon Kinesis

Git

❖ Software Development Life Cycle (SDLC)

❖ Waterfall and Iterative Model

❖ Agile Development Model

❖ Phases of DevOps

Week 8

❖ Phases of DevOps Tools

❖ DevOps Lifecycle

❖ Version Control Systems

❖ Configuring Git

❖ Remote Repository

❖ Git Remote Command

❖ Fork and Pull Request in GitHub

Week 9

❖ Branching

❖ Branching Operation

Jenkins

❖ Continuous Integration

❖ Configuring and Creating Jenkins Jobs

❖ Global Tool Configuration and Jenkins Integration

❖ Parameterized Builds

❖ Email Notification and Securing Jenkins

Week 10

❖ Code Coverage in Jenkins

❖ Shell Builds in Jenkins

❖ Managing Plugins and Backup in Jenkins

❖ Install and Configure Tomcat

❖ Parallel Jenkins Build and Archive Generated Artifact

Ansible

❖ Configuration Management

❖ Deployment Using Ansible

Week 11

❖ Ansible AD-Hoc Commands and Playbooks

❖ Playbook structure and Variables

❖ Ansible Tags and Ansible Vault

❖ Ansible Modules and Roles

❖ Inventory Management

❖ Ansible Roles

Week 12

Docker

❖ Introduction to Containerization

❖ Virtual Machine and Containers Classification

❖ Docker Engine

❖ Port Binding and Docker Modes

❖ Docker CLI and Restart Policy

❖ Dockerfile

❖ Image Management

❖ Docker Registry

❖ Docker Compose and Orchestration in Docker

Week 13

Kubernetes

❖ Kubernetes Concepts

❖ Kubernetes Commands

❖ Kubernetes Pods and Init Container

❖ Kubernetes Networking

Week 14

❖ Kubernetes Controllers and Self-Healing Applications

❖ Kubernetes Resource Limiting and Multiple Schedular

❖ Kubernetes Controllers

❖ Kubernetes Scaling and Horizontal Pod Autoscaler (HPA)

Week 15

DevOps on Cloud

❖ Introduction to DevOps on Cloud

❖ AWS CodeBuild

❖ AWS CodeDeploy

❖ AWS CodePipeline and AWS CodeStar

❖ CloudFormation

❖ Advanced CloudFormation Concepts Part – 1

❖ Advanced CloudFormation Concepts Part – 2

Week 16

❖ Stack

❖ Container Orchestration and Elastic Container Service (ECS)

❖ Container Instance and Networking Modes in ECS

❖ Amazon Elastic Container Registry (ECR)

❖ ECS in Fargate Launch Type

❖ Elastic Kubernetes Service and Its Uses

Week 17

❖ Application Deployment Using Beanstalk

❖ Docker in Elastic Beanstalk

❖ Deployment Options in Elastic Beanstalk

❖ Platform Updates and Configuration Files

❖ Monitoring and Troubleshooting in Elastic Beanstalk

100% Job Oriented Full Stack Masters Program Syllabus

Month 1: Introduction to Web Development and HTML/CSS (16 hours)

Week 1-2

❖ Introduction to Web Development (2 hours)

❖ HTML Fundamentals (4 hours)

❖ Styling with CSS (4 hours)

❖ Responsive Design (6 hours)

Week 3-4

❖ JavaScript and Front-End Frameworks (32 hours)

❖ Introduction to JavaScript (6 hours)

❖ DOM Manipulation (6 hours)

❖ Introduction to React.js (10 hours)

❖ Building UI Components with React (10 hours)

Month 2: Back-End Development and Databases (48 hours)

Week 4-5

❖ Back-End with Node.js and Express.js (24 hours)

❖ Introduction to Node.js (6 hours)

❖ Building RESTful APIs with Express.js (12 hours)

❖ User Authentication and Authorization (6 hours)

Week 5-6

❖ Databases and API Integration (24 hours)

❖ Introduction to Databases and MongoDB (6 hours)

❖ NoSQL Databases (4 hours)

❖ Connecting Back-End to Database (4 hours)

❖ Consuming APIs on the Front-End (6 hours)

❖ Handling API Responses (4 hours)

Month 3: Advanced Topics and Full-Stack Development (48 hours)

Week 6-7

❖ Advanced Back-End and Security (24 hours)

❖ Advanced Express.js Concepts (8 hours)

❖ User Authentication using JWT (6 hours)

❖ Secure Coding Practices (6 hours)

Week 7-8

❖ Deployment and Capstone Project (24 hours)

❖ Deployment Strategies (4 hours)

❖ Introduction to Docker (4 hours)

❖ Project Work and Implementation (8 hours)

Month 4: Full-Stack Application Development (48 hours)

Week 8-9

❖ Full-Stack Application Development (32 hours)

❖ Integrating Front-End with Back-End (6 hours)

❖ State Management in React (8 hours)

❖ Real-Time Communication with Websockets (6 hours)

❖ Project Work and Mentoring (12 hours)

Week 9-10

❖ Emerging Trends and Final Presentations (16 hours)

❖ Introduction to PWAs and Serverless Architecture (8 hours)

❖ Student Project Presentations and Peer Evaluation (8 hours)