



AI Vision Your Future
Technical and Training Services

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Artificial Intelligence Diploma

Intermediate Level

Diploma Courses:

1. Python Course (40 hour)
2. Math & Statistics Course (20 hour)
3. Machine Learning Course (60 hour)
4. Deep learning (40 hour)
5. Projects

■ Prerequisites:

- None

Course 1 “Python” :(40 hour)

Module 1: introduction to AI

- What is AI?
- Applications of AI?
- History of AI.
- Companies working in AI.

Module 2: Introduction to Python

- Overview of Python and its uses
- Installing Python and running your first program
- Basic syntax and data types in Python
- Variables and assignments
- Basic arithmetic operators and expressions
- Introduction to strings and string manipulation

Module 3: Control Structures

- Conditional statements and expressions
- Comparison and logical operators
- Loops and iteration
- Functions and function calls
- Scope and global/local variables
- Recursion and iterative algorithms

Module 4: Data Structures

- Lists and tuples.
- Dictionaries and sets
- Arrays and matrices
- Strings and regular expressions

Module 5: File Input/Output

- Reading and writing files
- CSV, JSON, and other data formats
- Exception handling
- Debugging techniques
- Logging and profiling

Module 6: Object-Oriented Programming

- Classes and objects
- Inheritance and polymorphism
- Encapsulation and abstraction
- Class methods and static methods
- Special methods and operator overloading

Module 7: Web Scraping

- Introduction
 - Definition of web scraping
 - Why web scraping is important.
 - Legal and ethical considerations
- HTML Basics
 - Structure of HTML documents
 - HTML tags and attributes
 - Using the browser inspector to inspect HTML code.
- Web Scraping with Python
 - Introduction to BeautifulSoup library
 - Retrieving data from websites using requests library
 - Parsing HTML code with BeautifulSoup
 - Finding and extracting data from HTML elements



Course 2 “Math and Statistics”: (20 hour)

Module 1

1. Linear Algebra
 - Vectors and Matrices
 - Matrix Operations (Addition, Scalar Multiplication, Transpose, Matrix Multiplication, Inverse)
 - Eigenvalues and Eigenvectors
 - Singular Value Decomposition
 - Matrix Factorization (QR, LU, Cholesky)
2. Calculus
 - Limits and Continuity
 - Derivatives (Chain Rule, Product Rule, Quotient Rule)
 - Optimization with Derivatives (Maxima and Minima)
3. Probability Theory
 - Probability Spaces and Random Variables
 - Probability Distributions (Bernoulli, Binomial, Poisson, Normal, Exponential)
 - Joint and Conditional Probability
 - Central Limit Theorem

Module 2

1. Descriptive Statistics
 - Measures of Central Tendency (Mean, Median, Mode)
 - Measures of Dispersion (Variance, Standard Deviation, Range)
 - Histograms and Box Plots
 - Probability Density Functions
2. Inferential Statistics
 - Hypothesis Testing (Null and Alternative Hypotheses, p-values, Type I and Type II errors)
 - Confidence Intervals

Course 3 “Machine Learning”: (60 hour)

Module 1:

- Introduction to Machine Learning
 - Definition of machine learning
 - Different types of machine learning
 - Applications of machine learning
 - Overview of the machine learning process

Module 2:

- Data Preprocessing and Exploratory Data Analysis
 - Third party libraries
 - Data collection and cleaning
 - Data preprocessing techniques (e.g., normalization, scaling)
 - Exploratory data analysis (EDA)
 - Data visualization

Module 3:

- Supervised learning
 - Regression
 - Linear regression
 - Polynomial regression
 - KNN
 - Decision tree
 - Random forest
 - Classification
 - Logistic Regression
 - KNN
 - Naïve bay's
 - Decision tree
 - Random forest
 - adaBoost
 - XGBoost
 - SVM
- Dimensionality Reduction
 - Feature selection
 - Feature extraction

Module 4:

- Unsupervised learning
 - Clustering
 - k-means
 - agglomerative, divisive
 - BDSCAN
 - Recommendation systems
 - Apriori

Module 5:

- Model Evaluation
 - Training, validation, and testing sets
 - Performance metrics (e.g., accuracy, precision, recall)
 - Cross-validation
 - Hyperparameter tuning.



Course 4 “Deep Learning” :(40 hour)

Module 1:

- Introduction to Deep Learning
 - Overview of Deep Learning and its applications
 - Neural Networks and their history
 - Perceptron
 - ANN
 - Types of Neural Networks (e.g., feedforward, convolutional, recurrent)

Module 2:

- Train neural network
 - Feedforward and backpropagation
 - Loss types
 - Activation functions
 - Gradient descent types

Module 3:

- TensorFlow
- Keras
- Overfitting and underfitting
- How solve overfitting problem.

Module 4:

- Optimization
 - Gradient descent
 - Stochastic gradient descent
 - Adagrade
 - Rmsprop
 - Adam
 - Learning decay

Module 5:

- Generative Models

Projects

- News Aggregator
- E-commerce Price Tracker
- Real Estate Listings Scraper
- Customer Segmentation and Analysis
- Healthcare Data AnalysisMarket Basket Analysis
- Customer Churn Analysis
- Healthcare Diagnostics
- House Pricing
- Customer Churn
- Predictive Maintenance
- Energy Consumption Forecasting
- Recommendation Systems for E-commerce.
- Real Estate Prediction
- Machine Maintenance
- Anomaly Detection

