

Artificial Intelligence & Machine Learning

150 Hours

SYLLABUS

Unit 1 : Introduction To Python

- Short history
- Introduction
- Features of Python
- Python Interpreter
- How to Run Python
- Basic Syntax
- Input, Output Functions
- Comments

Unit 2 : The Basics

- Variable and Data Types
- Numbers - Strings - Lists - Tuple - Set - Dictionary
- Operators
- Arithmetic Operations

Unit 3 : Conditional Statements

- Vif Statement
- if...else Statement
- if...elif...else Statement
- Nested if statement

Unit 4 : Conditional Statements

- For loop
- For loop with else
- While Loop
- While Loop with else statement
- Nested loops

Unit 5 : Control Statements

- Break statement
- FoContinue statement
- Pass statement

Unit 6 : Comprehensions

- List Comprehensions
- Set Comprehensions
- Dictionary Comprehensions

Unit 7 : Functions

- Definition
- Function Calling
- Function Arguments
- Default Arguments
- Variable-length arguments
- Lambda functions
- Recursive functions
- Functions returning values

Unit 8 : Modules

- Creating Modules
- Import Statements
- Packages

Unit 9 : File Handling

- Opening a File
- Reading from a File
- Writing to a File
- Closing a File
- File Methods
- Renaming a File
- Deleting a File
- Directories in Python

Unit 10 : Exception Handling

- Exception with arguments
- Raising an Exception
- User-defined Exception
- Assertions in Python

Unit 11 : Object Oriented Programming with Python

- Overview of Classes and Objects
- Using Class
- Using Methods
- Use Object Data
- Inheritance
- Destructors
- Encapsulation
- Data hiding
- Method overriding
- Polymorphism

Unit 12 : Regular expressions

- Introduction
- match() function
- search() function
- search and replace
- regular expression modifiers
- regular expression patterns

Unit 13 : Database Programming

- Connecting to a database
- Creating a Database
- Creating DB table
- Insert and Update Records
- Retrieve and Delete Records
- Transaction Control
- Disconnecting from a database

Unit 14 : GUI - tkinter

- tkinter basics
- sample application

Unit 15 : Introduction to Machine Learning

- What is machine learning
- Applications
- Supervised vs Unsupervised learning
- Data Processing

Unit 16 : Regression & Classification

- Linear Regression
- Non-linear Regression
- K-Nearest Neighbour
- Decision Trees
- Logistic Regression
- Support Vector Machines

Unit 17 : Clustering

- K-Means Clustering
- Hierarchical Clustering
- Density-Based Clustering

Unit 18 : Python Libraries for ML

- Numpy
- SciPy
- Pandas
- Scikit-learn
- Matplotlib

Unit 19 : Image Data in Machine Learning

- Image storage formats
- Scikit-image
- Smoothing and denoising
- Working with text and databases - NLTK

Unit 20 : Data Analysis Project

- Project - Predictions & Visualizations

Unit 21 : AI Introduction

- Defining Artificial Intelligence
- AI techniques

Unit 22 : Neural Networks

- Introduction to PyTorch
- Installing PyTorch on Linux
- Working with PyTorch and NumPy
- Handling Datasets in PyTorch
- Deep Learning Using PyTorch
- Building a Simple Neural Network
- Optimizing and Training in NN
- CNN and RNN for recognition
- Logistic Regression
- Pattern Recognition
- Opencv - image processing & manipulations

Unit 23 : Matlab in Machine Learning

- Introduction to Matlab
- Matlab Environment setup
- Matlab basic functions
- Conditional statements: MATLAB programming
- Overview of Linear Algebra
- Linear Algebra Theory – 1
- Linear Algebra Theory – 2
- Linear Algebra Theory – 3
- Moving Data Around

- Manipulation of DATA
- Computations on DATA
- Linear Algebra Quiz
- Face and Image Recognition using matlab
- Image hashing using matlab

Unit 24 : TensorFlow

- Building a Neural Network with TensorFlow

Unit 25 : Cognitive Analysis

- Create user minibatch sources
- Debug CNTK programs
- Read and feed data to CNTK Trainer
- Train model using declarative and imperative API
- Use CNTK learners

Unit 26 : Recommendation Systems

- Introduction to Recommendation Systems
- Popularity based model
- Hybrid Models
- Content based recommendation systems
- Collaborative filtering

Unit 27 : NLTK and NLP-Python

- Bag of Words Model
- POS Tagging
- Tokenization
- Word Vectorizer
- TF-IDF
- Stop Words
- Statistical NLP
- Sequential NLP

Unit 28 : AI application

- Image Classification
- Face Recognition

Our Facilities



