

# MACHINE LEARNING

## Contents

- 1 Course Details
  - ◆ 1.1 COURSE OBJECTIVE
  - ◆ 1.2 Pre-requisite courses
  - ◆ 1.3 SYLLABUS
    - ◇ 1.3.1 UNIT I - INTRODUCTION TO ARTIFICIAL INTELLIGENCE
    - ◇ 1.3.2 UNIT II INTRODUCTION TO DATA SCIENCE
    - ◇ 1.3.3 UNIT III - PYTHON FOR DATA SCIENCE
    - ◇ 1.3.4 UNIT IV - DATA VISUALIZATION USING PYTHON
    - ◇ 1.3.5 UNIT V - EXPLORE MACHINE LEARNING USING PYTHON
  - ◆ 1.4 SUGGESTED ACTIVITIES
  - ◆ 1.5 SUGGESTED EVALUATION METHODS
  - ◆ 1.6 COURSE OUTCOMES
  - ◆ 1.7 REFERENCE(Course Material)

## Course Details

Course Code L T P C

SB8008 1 0 2 2

## COURSE OBJECTIVE

The objective of this course is to provide a view of data science, recognize why data science is gaining importance in today's business world to comprehend where data science can be applied across industry domains to understand major components of data science stack to learn how a data science project is implemented step-by-step in each business use-case

## Pre-requisite courses

Pre-requisite Knowledge	Courses Available on Springboard
Probability and Statistics	Probability and Statistics Probability distribution using Python Statistical Inference using Python
Python Programming Language	Programming Fundamentals using Python - Part 1
Linear Algebra	Basics of Linear Algebra
Regression Analysis	Regression Analysis

## SYLLABUS

### UNIT I - INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Why AI? - What is AI? - AI in Practice - AI in Business - AI Platforms.

### UNIT II INTRODUCTION TO DATA SCIENCE

Data Science: The Data Revolution - Components of Data Science - Data Science in Action ? Conclusion.

## UNIT III - PYTHON FOR DATA SCIENCE

Why Python Libraries ? NumPy - Introduction to NumPy - Operations on NumPy ? Pandas ? Introduction to Pandas ? Introduction to Pandas Object ? Working with datasets ? Pandas Plots - Matplotlib ? Introduction to Matplotlib ? Types of Plots ? Scikit-learn ? Machine Learning using sklearn. [Practical hands-on exercises using NumPy, Pandas, Matplotlib]

## UNIT IV - DATA VISUALIZATION USING PYTHON

Data visualization using Python: Data Visualization: Developing insights from data using Basic Plots using Matplotlib (Box, Scatter, Line, Bar, Pie, Histogram), Statistical analysis using Heatmap, Kernel Density plot using Seaborn, Network Graphs, Choropleth Map Using Plotly, Word Cloud. [Practical hands-on exercises for creating charts]

## UNIT V - EXPLORE MACHINE LEARNING USING PYTHON

Introduction to Machine Learning - Regression ? Classification ? Clustering ? Introduction to Artificial Neural Network. [Hands-on Exercises for Practicing Machine Learning Models Using Capstone Project]

**TOTAL: 45 PERIODS**

## SUGGESTED ACTIVITIES

- Continuous / Self-Assessment (MCQ)
- Capstone Project ? Build a ML model using a given numerical COVID-19 dataset, predict the number of confirmed cases for next ten days in different areas of the world

## SUGGESTED EVALUATION METHODS

- Video Proctored Exam
- Self-Assessment

## COURSE OUTCOMES

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

**CO1** :Demonstrate fundamental understanding of the history of artificial intelligence (AI)and its foundations.

**CO2** :Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning. **CO3** :Assess and select appropriate data analysis models for solving real-world problem. **CO4** :Demonstrate the importance of data visualization, design, and use of visual components.

## REFERENCE(Course Material)

1. [Introduction to AI](#)
2. [Introduction to Data Science](#)
3. [Python for Data Science](#)
4. [Data visualization using Python](#)
5. [Explore Machine Learning](#)
6. [Object Detection and Recognition Using Deep Learning in OpenCV](#)

**Mode of Training:** Online (Self-Learning)

**Software Configuration to be arranged in Institution Premises:** o Python and related libraries

**Hardware Configuration to be arranged in Instituion Premises:** o Windows 10, 16GB RAM

**Course Evaluation:** Online Assessment

**Multiple Hybrid Branch of Students** Applicable for Mechanical/Chemical

**Internship/Placement Opportunities** [Click Here](#)

**NOS Alignment:** Yes, Infosys Industry Standard  
**Train-the-Trainer:** Faculty Enablement Program  
**Commercials:** Free of Cost