Contents

Course Details

Course Code	L	T	P	C
SB8007	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 Probabilty distribution using Python Statistical Interence using Python
Python Programming Language	Programming Fundamentals using Python - Part 1
Linear Algebra	Basics of Linear Algebra
Regression Analysis	Regression Analysis
Deep Learning	Deep Learning for Developers
Exploratory Data Analysis	Exploratory data analysis

SYLLABUS

UNIT I - INTRODUCTION TO AI AND DATA SCIENCE

Why AI? - What is AI? - AI in Practice - AI in Business - AI Platforms. Data Science: The Data Revolution - Components of Data Science - Data Science in Action ? Conclusion.

UNIT II - 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 III - 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 Ploty, Word Cloud. [Practical hands-on exercises for creating charts]

=== UNIT IV - 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]

UNIT V - OBJECT DETECTION AND RECOGNITION USING DEEP LEARNING IN OPENCV

Basic Operations and Algorithms in OpenCV - Object Detection and Recognition Using Features - Deep Learning in OpenCV - Object Classification Using Deep Learning, Recognizing Text in an Image.

TOTAL : 45 PERIODS

SUGGESTED ACTIVITIES

- Continuous / Self-Assessment (MCQ)
- Capstone Project - Build a ML model using a sample image dataset, to detect or identify specific features in sample image such as mask on human face etc.,

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.
CO5 : Demonstrate fundamental understanding of applications of machine learning for object recognition

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)
Course Evaluation: Online Assessment
Multiple Hybrid Branch of Students: Applicable for IT/CSE
Internship/Placement Opportunities: Click Here
NOS Alignment: Yes, Infosys Industry Standard
Train-the-Trainer: Faculty Enablement Program
Commercials: Free of Cost