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| **CSE26** | **PYTHON PROGRAMMING FOR DATA ANALYTICS** | **3** | **0** | **0** | **3** | |
| **Prerequisite** | CS008 | | | | | |
| **Course Objectives** | 1. Understanding the basic concepts of Python. 2. Preparing and pre-processing data 3. Understanding the data aggregation and grouping concepts 4. Understanding web scraping 5. Visualizing the results of analytics effectively | | | | | |
| **Course**  **Outcomes** | On successful completion of this course the students will be able to:   1. Understanding of scripting and the contributions of scripting languages. (1) 2. Obtain an understanding on basic Concept of Python programming language. (1) 3. Gain knowledge on various pre-processing data. (1,2) 4. Obtain thorough knowledge on Data Analysis. (1)   ***Note: Numbers given in the parenthesis refer to Graduate Attributes required by (NBA).*** | | | | | |
| **UNIT I** | **INTRODUCTION TO PYTHON** | | | | |  |
| Introduction to the Python’s World - Python—The Programming Language – Python - The Interpreter - Python 2 and Python 3 - Installing Python - Python Distributions - Using Python - Writing Python Code – Ipython - The IDEs for Python – SciPy. | | | | | | |
| **UNIT II** | **PROGRAMMING WITH PYTHON** | | | | |  |
| The NumPy Library - Basic Operations - Indexing, Slicing, and Iterating - Conditions and Boolean Arrays - Structured Arrays. Pandas: The Python Data Analysis Library – Installation - Introduction to pandas Data Structures - Function Application and Mapping. Pandas: Reading and Writing Data. | | | | | | |
| **UNIT III** | **INTRODUCTION TO DATA ANALYSIS** | | | | |  |
| An Introduction to Data Analysis - Data Analysis - Knowledge Domains of the Data Analyst - Understanding the Nature of the Data - The Data Analysis Process - Quantitative and Qualitative Data Analysis. | | | | | | |
| **UNIT IV** | **APPLYING DATA ANALYSIS IN PYTHON** | | | | |  |
| Pandas in Depth: Data Manipulation - Data Visualization with matplotlib - Machine Learning with scikit-learn, Data Aggregation and Group Operations - GroupBy Mechanics - Data Aggregation - Group-wise Operations and Transformations - Pivot Tables and Cross-Tabulation. | | | | | | |
| **UNIT V** | **REAL TIME APPLICATIONS** | | | | |  |
| Time Series - Date and Time Data Types and Tools - Time Series Basics - Date Ranges, Frequencies, and Shifting - Time Zone Handling - Periods and Period Arithmetic - Resampling and Frequency Conversion. Financial and Economic Data Applications - Data Munging Topics - Group Transforms and Analysis. | | | | | | |
| **TEXT BOOKS** | | | | | | |
| 1. David M. Beazley “Python Essential Reference”, Fourth Edition, 2009 by Pearson Education. 2. Fabio Nelli “Python Data Analytics Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language” Apress Media LLC, 233 Spring Street, New York, 2015. 3. Wes McKinney “Python for Data Analysis” Published by O’Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472. October 2012: First Edition | | | | | | |
| **REFERENCES** | | | | | | |
| 1. Wes McKinney “Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython” O'Reilly Media; 1 edition (8 October 2012) 2. James Payne “Beginning Python Using Python 2.6 and Python 3.1” Wiley Publishing, Inc.10475 Crosspoint Boulevard, Indianapolis, IN 46256 3. John Paul Mueller “Beginning Programming with Python for Dummies” John Wiley & Sons, Year 2014 | | | | | | |