# 23AD22P2 - DATA SCIENCE USING PYTHON LAB

(AI&DS)

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| Course Category: | Professional Core | Credits: | 1.5 |
| Course Type: | Practical | Lecture-Tutorial-Practical: | 0-0-3 |
| Prerequisite: | Familiarity with Jupyter Notebooks for interactive coding and data analysis | Sessional Evaluation:Univ. Exam Evaluation:Total Marks: | 3070100 |
| Objectives: | **Students undergoing this course are expected:** |
| * The main objective of the course is to inculcate the basic understanding of Data Science and its practical implementation using Python.
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| Course Outcomes | **Upon successful completion of the course, the students will be able to:** |
| CO1 | Apply principles and techniques for optimizing the performance of Pythonapplications  |
| CO2 | Implement parallel computing applications using Python  |
| CO3 | Develop GPU accelerated Python applications  |
| Course Content | List of Experiments1. **Creating a NumPy Array**a. Basic ndarrayb. Array of zerosc. Array of onesd. Random numbers in ndarraye. An array of your choicef. Imatrix in NumPyg. Evenly spaced ndarray
2. **The Shape and Reshaping of NumPy Array**a. Dimensions of NumPy arrayb. Shape of NumPy arrayc. Size of NumPy arrayd. Reshaping a NumPy arraye. Flattening a NumPy arrayf. Transpose of a NumPy array
3. **Expanding and Squeezing a NumPy Array**a. Expanding a NumPy arrayb. Squeezing a NumPy arrayc. Sorting in NumPy Arrays
4. **Indexing and Slicing of NumPy Array**a. Slicing 1-D NumPy arraysb. Slicing 2-D NumPy arraysc. Slicing 3-D NumPy arraysd. Negative slicing of NumPy arrays
5. **Stacking and Concatenating Numpy Arrays**a. Stacking ndarraysb. Concatenating ndarraysc. Broadcasting in Numpy Arrays
6. **Perform following operations using pandas**a. Creating dataframeb. concat()c. Setting conditionsd. Adding a new column
7. **Perform following operations using pandas**a. Filling NaN with string.

b. Sorting based on column valuesc. groupby()1. **Read the following file formats using pandas**a. Text filesb. CSV filesc. Excel filesd. JSON files
2. **Read the following file formats**a. Pickle filesb. Image files using PILc. Multiple files using Globd. Importing data from database
3. **Demonstrate web scraping using python**
4. **Perform following preprocessing techniques on loan prediction dataset**a. Feature Scalingb. Feature Standardizationc. Label Encodingd. One Hot Encoding
5. **Perform following visualizations using matplotlib**a. Bar Graphb. Pie Chartc. Box Plotd. Histograme. Line Chart and Subplotsf. Scatter Plot
6. **Getting started with NLTK, install NLTK using PIP**
7. **Python program to implement with Python Sci Kit-Learn & NLTK**
8. **Python program to implement with Python NLTK/Spicy/Py NLPI**
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| E-Resources | 1.<https://www.analyticsvidhya.com/blog/2020/04/the-ultimate-numpy-tutorial-for-datascience-beginners/> 2.<https://www.analyticsvidhya.com/blog/2021/07/data-science-with-pandas-2-minutesguide-to-key-concepts/> 3.<https://www.analyticsvidhya.com/blog/2020/04/how-to-read-common-file-formatspython/>4.[https://www.analyticsvidhya.com/blog/2016/07/practical-guide-data-pre processing python-scikit-learn/](https://www.analyticsvidhya.com/blog/2016/07/practical-guide-data-preprocessingpython-scikit-learn/)5.<https://www.analyticsvidhya.com/blog/2020/02/beginner-guide-matplotlib-datavisualization-exploration-python/6>.6. <https://www.nltk.org/book/ch01.html> |