CIIT College of Arts and Technology

SPECIALIST AND CORPORATE CLASSES

Data Science

Python

Course Duration:

No. of hours per session: 4 hours
No. of sessions: 10 sessions
Total training hours: 40 hours

Course Description:

Data science can be defined as a blend of mathematics, business acumen, tools, algorithms and machine learning techniques, all of which help us in finding out the hidden insights or patterns from raw data which can be of major use in the formation of big business decisions.

In data science, one deals with both structured and unstructured data. The algorithms also involve predictive analytics in them. Thus, data science is all about the present and future. That is, finding out the trends based on historical data which can be useful for present decisions and finding patterns which can be modeled and can be used for predictions to see what things may look like in the future.

Data Science is an amalgamation of Statistics, Tools and Business knowledge. So, it becomes imperative for a Data Scientist to have good knowledge and understanding of these.

Course Objective:

After taking this course:

- Understand the full data science pipeline and be familiar with programming tools to accomplish the different portions.

- Be able to collect data from unstructured sources and store it using appropriate structure such as relational databases, graphs, matrices, etc.
- Know to explore and visualize your data.
- Be able to analyze your data rigorously using a variety of statistics and machine learning approaches.

Course Output:

Final Presentation for Data Science course.

Course Outline:

Week	Training Content	Learning Objective
1	**Introduction to Python/ Jupyter Notebook**	• The Python Language and Jupyter Notebook • Introduction to Python Objects and Operations • Basic Python Functions and NumPy Library • Python and Jupyter Notebook • JupyterLab
2	**Control Structures**	• Environment • Basic Syntax • Type of Conversion • Variables • Constant • Operators
3	**Functions**	• Defining a Functions • Functions Declaration • Calling a Function • Function Arguments • Default Values for Parameters
4	**Data Collection and Scraping**	• The data collection process • Common data formats and handling • Regular expressions and parsing
5	**Relational Data**	• Overview of relational data • Entity relationships • Pandas and SQLite • Joins
6	**Visualization and Data Exploration**	• Basics of visualization • Data types and visualization types • Software plotting libraries

7	**Vectors, Matrices, and Linear Algebra**	• Matrices and vectors • Basics of linear algebra • Libraries for matrices and vectors • Sparse matrices
8	**Introduction to Machine Learning**	• Least squares regression: a simple example • Machine learning notation • Linear regression revisited • Matrix/vector notation and analytic solutions • Implementing linear regression
9	**Design Thinking**	• Empathize • Define • Ideate • Prototype • Test
10	**Final Project Presentation**	• Final Project