

**SYLLABI**

**For**

**Value Added Course  
Certificate Course in Data Science Basics**

**Offered by**

**Department of Information Communication and Technology**

**TECNIA INSTITUTE OF ADVANCED STUDIES**

**GRADE 'A' INSTITUTE**

**3 PSP, Institutional Area, Sector – 14, Rohini, Delhi - 110085**

  
**BCA-TIAS**

  
Coordinator  
Internal Quality Assessment Cell (IQAC)  
Tecnia Institute of Advanced Studies  
New Delhi-110085

**Syllabus**  
**For**  
**Value Added Program**

**Course Code: BCA -384**

**Course Name: Certificate Course in Data Science Basics**

**LEARNING OBJECTIVES:**

This course will provide the learners the following: -

- To enable students, develop IT skills that are a pre-requisite in today's work environment.
- To equip them with basic computing skills that will enhance their employability in general.
- To enable the student to analyze and present information in a meaningful manner.

**PRE-REQUISITES:** None

**COURSE OUTCOMES:**

After completion of this course, the learners will be able to:-

- Programming & working with data.
- Conduct a wide range of statistical test.
- Understand machine learning algorithm.

**Unit 1**

**No. of Hours: 7**

Understanding The Fundamentals Of Data Science , Knowledge Of Data Collection , Python Programming , Python Libraries , Principles, And Techniques Used In Data Science , Data Extraction , Data Transformation

**Unit 2**

**No. of Hours: 7**

Statistical Methods For Decision Making , Classification & Regression Algorithms , Introduction To Machine Learning , Probability Distributions, Hypothesis Testing, Correlation, And Regression Analysis , Data Transformation , Data Reduction , Classification , Decision Trees

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**Unit 3****No. Of Hours: 8**

Exploratory Data Analysis , Data Visualization , Creating Plots, Charts, And Graphs , Data Preprocessing , Ethical Considerations , Data Privacy , Data Security, Responsible Use Of Data , Feature Selection , Data Science Ecosystem , Hands-On Experience , Real-World Datasets , Data Science Tools

**Unit 4****No. Of Hours: 8**

Predictive Modelling , Critical Thinking And Problem-Solving , Types Of Machine Learning , Communication And Collaboration , Machine Learning Algorithm , Decision Trees and Random Forests , Evaluation metrics: Accuracy, Precision, Recall, F1-score, ROC Curve

**TEXT BOOK:**

1. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" by Aurélien Géron, 2016.
2. Python Data Science Handbook" by Jake VanderPlas, 2016.
3. Data Mining: Concepts, Models, Methods, and Algorithms by Mehmed Kantardzic Publication Hadley Wickham. 2015

**REFERENCE BOOK:**

1. Python for Data Analysis" by Wes McKinney, 2014.
2. Data Science for Business" by Foster Provost and Tom Fawcett, 2014.
3. Data Science from Scratch: First Principles with Python" by Joel Grus, 2015.

**Evaluation Pattern:** On the basis of practical exam followed by viva.

  
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