# Guru Tegh Bahadur Institute of Technology, New Delhi

**Lecture Plan for Foundations of Data Science**

# Course Name: B.Tech (AIML) Semester: 5th SUB CODE: AIML203

No of hours allotted to complete the syllabi: **40**

No of hours allotted per week: **3**

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| **S.No** | **Topic Details** | **No of Hours Planned** | **Reference/text book** |
| 1. | **Unit-I:** |  |  |
|  | Introduction to data science, Applications of data scienceData scientist roles and responsibilities, Skills needed to become a data scientistNeed of Python for data analysisIntroduction to data understanding and pre-processingDomain knowledge, Understanding structured and unstructured dataCreation of synthetic dataset in MS Excel |  111 212 |  T1, R1 T1, R1 T1, R1, R2 T2, R1, R2 T1, R1, R2  T1, R1, R2 |
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| 2. | **Unit-II**Basics of Python programming: Variables, printing values, if condition, arithmetic operations, loopsData Analysis processDataset generation, Importing Dataset: Importing and Exporting DataBasic insights from datasetsCleaning and preparing the data: Identify and Handle missing values. | 4 122 3 | T2, R1, R2T2, R1, R2T2, R2T3, R1, R2T3, R1, R2 |
| 3. | **Unit-III**Basics of Essential Python libraries: Introduction to NumPy, Pandas, Matplotlib, SciPyData processing, Data visualizationBasic visualization toolsSpecialized visualization toolsSeaborn Creating and Plotting maps | 51222  | T2, R1, R2T3, R1, R2T3, R1. R2T3, R1. R2T3, R1. R2 |
| 4.  | **Unit-IV**Mathematical and scientific applications for data analysisBasics of Supervised and Unsupervised learning, Decision makingTrend and predictive mining using pythonRecommender systems | 2222 | T1, R1, R2T3, R1, R2T2, R1, R2T3, R1, R2 |

## Text Books:

[T1] Wes Mckinney, Python for Data Analysis, First Edition, Publisher O’Reilly Media

[T2] Foundational Python for Data Science, 1st edition, Kennedy Behrman, Pearson Publication

[T3] Data analytics using Python, Bharti Motwani, Wiley Publication

## Reference Books:

[R1] Allen Downey, Jeffrey Elkner, Chris Meyers, Learning with Python, Dreamtech Press.

[R2] Reema Thareja. Python Using Problem Solving approach, Oxford University press