Syllabus
Minor in Data Science
(Sem.- III)

Title of Paper: Python for Data Science

Sr. No.	Heading	Particulars
1	**Description of the course :** **Including but Not limited to :**	Advanced python programming practical modules make able to acquire knowledge for implementing python code for various applications such as handling data, analysing and visualizing data. Database Management System's practical approach is useful to gain the knowledge for software backend development. It benefits to user by providing data definition, data access, reduced data redundancy, data integrity, data sharing, data organizing, data consistency, data accuracy, and security.
2	**Vertical :**	Minor
3	**Type :**	Practical
4	**Credit**:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks
7	**Course Objectives**: 1. Implement Python for Data Processing – Utilize tuples, regular expressions, date-time functions, and libraries like NumPy and Pandas for data manipulation. 2. Understand Relational Databases & SQL – Identify entities, relationships, and relational structures while implementing constraints using SQL. 3. Perform Data Retrieval & Manipulation in SQL – Execute DML operations, apply built-in functions, retrieve and aggregate data, and work with joins and nested queries. 4. Manage Database Security & Access Control – Implement user access controls, security measures, and database backup strategies.	
8	**Course Outcomes**: 1. Apply Python for Data Handling – Utilize lists, tuples, regular expressions, date-time functions, and libraries like NumPy and Pandas for data processing. 2. Execute SQL Queries for Data Operations – Perform CRUD (Create, Read, Update, Delete) operations, table modifications, and database backup/restoration using SQL. 3. Retrieve & Analyze Data Using SQL – Use aggregate functions, joins, and nested queries to extract meaningful insights from relational databases. 4. Manage Database Security & Optimization – Implement access control, create virtual tables, and optimize database structures for secure and efficient data management.	

9	**Modules**:-	
	Module 1:	
	1a. Write a python code to print your profile. 1b. write a python code to print addition of two numbers. 1c. Write a python code to print square root of number. 1c. Write a python code to calculate area of Triangle. 1d. Write a python code to swap two variables. 2a. Write a python code to create nested tuples. 2b. Write a python code to sort the nested tuple using sorted() function. 2c. Write a python code to copy or clone list. 2d.Write a python code to check immutability property of python tuples. 3a. Write a python code for creating a variable and storing the text that we want to search 3b. Write a python code to retrieve data from HTML file. 3c. Write a python code to print current date in different format. 3d. Write a python code to convert time stamp to date stamp. 3e. Write a python code to develop calendar module. 3f. Write a python code to compare two dates.	
	Module 2:	
	4a. Write a python code to create Numpy Array. 4b. Write a python code to demonstrate basic operations on single array. 4c. Write a python code to create array with 10 elements and slice element from 1st to 5th element. 4d. Write a python code to sort an array alphabetically. 4e. Write a python code to create a filter array that will return maximum values from an array. 5a. Write a python code to demonstrate importing pandas libraries and create data frame object. 5b. Write a python code to show statistical information on given data set. 5c.Write a python code to create pandas series from dictionaries. 5d. Write a python code to demonstrate filter pandas series with Boolean arrays.	
10	**Text Books:** 1. Programming through Python M. T. Savaliya, R.K Maurya, G.M Magar, Staredu Solutions, 1st edition (2018) 2. Python DataScience Handbook, Jake VanderPlas, O'Reilly Media, 1st edition (2016)	
11	**Reference Books:** **1.** Let Us Python, Yashwant Kanetkar, BPB publication , 1st edition (2019) **2.** Programming in Python3, Mark Summerfield, Pearson Education, 2nd edition (2018) **3.** Learning Python, LutzM, O'Reilly- Shroff, 5th edition, 2013. **4.** Beginning Python, Magnus LieHetland, Apress, 2nd edition, 2009. Star Python, Star Certification, Star Certification,1st , 2018.	
12	**Internal Continuous Assessment: 40%**	**External, Semester End Examination 60% Individual Passing in Internal and External Examination**
13	**Continuous Evaluation through:** Students are expected to attend each practical and submit the written practical of the previous session. Performing Practical and writeup submission will be continuous internal evaluation.	