**Shyama Prasad Mukherji College**

**Teaching Plan ( August – Dec 2022)**

**Course and Year: B.Sc ( Hons) Computer Science, II Year**

**Semester: III**

**Taught individually or shared: Individually (Theory) / Shared with Dr. Jaya Gera (Practicals – 8 Practicals)**

**Paper: Programming in Python**

**Faculty: Akanksha Bansal Chopra**

**No. of Classes** (per week)**: 02 (theory) + 6 Practicals**

**Objective of the Course: The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.**

**Learning Outcomes: Problem solving and programming capability**.

**Name of the Units:**

1. **Unit I: Python Programming: An Introduction**
2. **Unit II : Variables and Functions**

**3. Unit III : Control Structures**

**4. Unit IV : Functions**

**5. Unit V : Strings and Lists**

**6. Unit VI : Mutable objects**

**7. Unit VII : Testing and Debugging**

**8. Unit VIII : Searching and sorting**

**9. Unit IX : Python 2D and 3D Graphics**

**10. Unit X : File Handling**

**11. Unit XI : Errors and Exceptions**

**12. Unit XII : Classes**

**Readings:**

**1. Taneja, S. and Kumar, N., (2018), Python Programming: A modular Approach. Pearson Education.**

**2. Liang, Y.D. (2017), Introduction to Programming using Python. Pearson Education.**

**Additional References:**

**3. Mckinney, W. (2017). Python for Data Analysis. Second edition, O’reilly (SPD).**

**4. Grus, J. (2016). Data Science from scratch. First edition, O’reilly (SPD).**

**5. VanderPlas, J. (2016). Python Data Science Handbook: Essential Tools for Working with Data. Second edition, O’reilly (SPD).**

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| **Week** | **Topics to be covered** |
| **1** | Introdruction, structure , variables, syntaxes, data types, Understanding Python |
| **2** | Identifiers, keywords, Literals, strings, arithmetic operators, relational operators, logical and bitwise operators |
| **3** | Python libraries, variables and assignment statements. Built in functions such as input and print. |
| **4** | If conditional statement, for loop, while loop, break, continue, pass statement, else, infinite loop |
| **5** | Function definition and call, default parameter values, keyword arguments, assert statement |
| **6** | Functions, Practical Assignments, weekly assignment |
| **7** | Revision 1 |
| **8** | Strings slicing, membership, and built in functions on strings, list operations |
| **9** | Passing a list as an argument, copying list objects, tuples, dictionary associated operations, built in functions |
| **10** | Weekly Assignment, Practical Assignment, Quiz , Revision 2 and Doubts |
| **11** | Revision 3 |
| **12** | Determining test cases, use of python debugger tool pydb for debugging |
| **13** | Linear search, binary search, selection sort, insertion sort, bubble sort |
| **14** | Visualization using graphical objects, file handling |
| **15** | Types of errors and exceptions Classes and objects |
| **16** | Practical Assignments, weekly assignment, Revision 4 |

Tentative Test Dates:

Test 1: 4th October 2022

Test 2: 23rd November 2022

Tentative Assignment Date: 25th October 2022

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