**Shyama Prasad Mukherji College**

**Teaching Plan**

**Course and Year: B.A. (P), IIIrd Year**

**Semester: V**

**Taught individually or shared: Individually**

**Paper: Programming in Python**

**Faculty: Jaya Gera**

**No. of Classes** (per week)**: 4**

|  |
| --- |
| **Programme Objective:**  The course familiarizes the students with fundamentals of computers hardware and software. It  introduces the basic computer technologies and provides hands-on practice in the use of commonly used software in small scale industry. Thus the course provides skills for entry level jobs. The course also inculcates logical and analytical thinking by way of offering programming languages. Modern programming languages like Python and R are covered, which enable students to move towards digital humanities. Specifically, the program aims the following achievements for students.  1. To attain understanding of computer technology, their applications and fundamentals.  2. To develop ability to apply knowledge of computing to solve computational problems.  3. To analyze a problem, and identify the computing requirements appropriate to its solution.  4. To design, implement, and evaluate a computer-based system, process or program to meet  the desired needs.  **Learning Outcomes:**  After completion of this course a student will be able to:  1. efficiently use Office Automation Tools like word processors, spreadsheets and presentation tools.  2. develop simple programming constructs in a Programming Language (eg. Python)  3. use multimedia authoring tools to design small applications using sound, audio, and video/animation.  4. develop simple websites using HTML/DHTML, CSS and JavaScript programming codes.  5. handle Computer Networks, modems and routers, and efficiently use Internet 6. Develop and implement a simple project based on case studies. |
| **Course Objective:**  The course introduces programming in Python and develops Python based solutions for simple problems.  **Course Learning Outcomes:**  On successful completion of this course, a student will be able to:    1. select a suitable programming construct and inbuilt data structure for a situation.  2. develop and document modular python programs.  3. use classes and objects in application programs. |
| **TEACHING PLAN** |
| **Name of the Unit I: Introduction to Python**  **Readings prescribed in the syllabus for this unit**  1. Severana, O. C. (2018). Python for Everybody (Exploring Data in Python 3). Shroff  Publisher.  2.Taneja, S., & Kumar, N. (2017). Python Programming- A modular Approach. Pearson.  **Readings given to students but not prescribed in syllabus (if any) for each unit**  [1] Python Programming: Using Problem Solving Approach, Oxford University Press, 1st Edition 2017.  [2] Problem Solving and Programming with Python, Oxford University Press, 1st Edition 2017.  [3] <https://stackoverflow.com/> (for python errors or particular type of query) |
| **Name of the Unit II: Creating Python Programmes and Functions**  **Readings prescribed in the syllabus for this unit**  1. Severana, O. C. (2018). Python for Everybody (Exploring Data in Python 3). Shroff  Publisher.  2.Taneja, S., & Kumar, N. (2017). Python Programming- A modular Approach. Pearson.  **Readings given to students but not prescribed in syllabus (if any) for each unit**  [1] Python Programming: Using Problem Solving Approach, Oxford University Press, 1st Edition 2017.  [2] Problem Solving and Programming with Python, Oxford University Press, 1st Edition 2017.  [3] Python Tutorial from the website: <https://www.python.org/> (for Math functions)  [4] <https://www.w3schools.com/> (for some more examples of functions) |
| **Name of the Unit III: Control Structures**  **Readings prescribed in the syllabus for this unit**  1. Severana, O. C. (2018). Python for Everybody (Exploring Data in Python 3). Shroff  Publisher.  2.Taneja, S., & Kumar, N. (2017). Python Programming- A modular Approach. Pearson.  3. Downey, A. B. (2015). Think Python How to think like a Computer Scientist (2nd Edition).O’Reilly    **Readings given to students but not prescribed in syllabus (if any) for each unit**  [1] Python Programming: Using Problem Solving Approach, Oxford University Press, 1st Edition 2017.  [2] Problem Solving and Programming with Python, Oxford University Press, 1st Edition 2017. |
| **Name of the Unit IV: Classes**  **Readings prescribed in the syllabus for each unit**  1. Severana, O. C. (2018). Python for Everybody (Exploring Data in Python 3). Shroff  Publisher.  2.Taneja, S., & Kumar, N. (2017). Python Programming- A modular Approach. Pearson.  **Readings given to students but not prescribed in syllabus (if any) for each unit**  [1] Python Programming: Using Problem Solving Approach, Oxford University Press, 1st Edition 2017. |
| **Name of the Unit V: List, Tuples and Dictionary**  **Readings prescribed in the syllabus for this unit**  1. Severana, O. C. (2018). Python for Everybody (Exploring Data in Python 3). Shroff  Publisher.  2.Taneja, S., & Kumar, N. (2017). Python Programming- A modular Approach. Pearson.  **Readings given to students but not prescribed in syllabus (if any) for each unit**  [1] Python Programming: Using Problem Solving Approach, Oxford University Press, 1st Edition 2017. |
| **No of classes required to complete the unit (approx.):**   1. **Unit I: 12 hours** 2. **Unit II: 14 hours** 3. **Unit III: 14 hours** 4. **Unit IV: 8 hours** 5. **Unit V: 12 hours** |
| **Sub topics to be covered and their order along with the respective time frames (if any)**  **Attached** |
| **Methodology of Teaching:**  **Lecture, Power point Presentations, Test, Viva Voice, Assignment, Practical demonstration, discussion of tests & Assignments, Problem/Exercise solve, Last Year Question Papers solve/Discussion, Doubt session** |
| **Assessment Plan**  **Tentative date of assessments/ assignments (time frame):**  Class Test I: Last week of September, 2022  Class Test II: Fourth week of October, 2022  Assignments: Second week of August, 2022  Second week of September, 2022  Third week of September, 2022  Second week of October, 2022    Viva Voice: second week of November, 2021  **Criteria of Assessment: Tests, Assignments and Viva Voice**  For Tests, Best of two will be considered. Viva Voice will be incorporated as part of practical exam internal assessment. Assignment and Test is considered as part of theory internal assessment. |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Lecture No** | | **Topics/Sub-topics to be covered** | | **Methodology** | | **Ref./Text Book** | | **Date of Delivery** | |
| **Unit 1 : Introduction to Python** | | | | | | | | | |
| Week 1 | Introduction to Programming & its background, Python Language, What is a program? Writing a Program, building blocks of a Program etc., Compiler, Interpreter, Types of Error, debugging etc | L + P + Demo | | [2] | |  | |
| Week 2 | Values and types, Variables, Variable names and keywords, , Statements, Operators and operands , Arithmetic operators order of operations, Evaluating expressions, data types & examples, Logical operators, examples of code | L + P + Demo | | [2] | |  | |
| Week 3 | Relational operators, input statement, Comments, mnemonic names Problem Discussion and Doubts, Exercise Solve | L + P + Demo | | [2,4] | |  | |
| **Unit II: Creating Python Programmes and Functions** | | | | | | | |
| Week 4 | Assignment -1 Given ,  Functions, Function calls, Built-in Functions, Type conversion, Math functions, Random Number Generation, | L + P + Demo | | [2] | |  | |
| Week 5 | User defined functions, Flow of execution, Examples of user defined functions,  Exercise, Problem and Doubts Discussion | L + P + Demo | | [2,4] | |  | |
| **Unit III: Control Structures** | | | | | | | |
| Week 6 | Conditional execution – if statement, Alternative execution, Nested conditionals, | L + P + Demo | |  | |  | |
| Week 7 | Chained conditionals, Problems based on if statement, Exercise, Problem and Doubts Discussion, class test-1 | L + P + Demo | |  | |  | |
| Week 8 | The while statement, Infinite loop with while, Programs based on while loop | L + P + Demo | |  | |  | |
| Week 9 | For loop, More about For loop, Programs based on for, while, and if constructs, Exercises based while, for and nested constructs, Problem, Doubts etc. | L + P + Demo | |  | |  | |
| **Unit II: Revisited : Strings** | | | | | | | | | |
| Week 10 | Strings, String comparison, Looping and counting, string and for loops, String Length, Traversal, String slices, find function, Looping and Counting etc., programs based on strings | L + P + Demo | | [1] | |  | |
| **Unit V: List, tuples, Dictionaries** | | | | | | | |
| Week 11 | List values, Accessing elements, List length, List membership, List operations, List deletion. Nested lists, List functions etc. and Programs based on Lists | L + P + Demo | | [1] | |  | |
| Week 12 | Tuples, sets, Dictionaries and operations on them | L + P + Demo | | [1] | |  | |
| **Unit II: Revisited : Recursive Functions** | | | | | | | |
| Week 13 | Recursive Functions, Programs based on Recursive functions, Problems and Doubts, Class Test-2 | L + P + Demo | | [4] | |  | |
| **UNIT-V Classes** | | | | | | | | | |
| Week 14 | Object Oriented Programming: Introduction to Classes, Objects and Methods, doubts and Problems | L + P + Demo | | [1] | |  | |
| Week 15 | Bit wise Operators, Scope of variables/objects, Default Parameters, etc, | Interactive Session | | [2] | |  | |
| Week 16 | Last Year Question Papers, Some Revisions | Interactive Session | | [2] | |  | |

**\*L for Lecture.**

**\*D for Demo, The Demonstration is given of the concept using the prescribed tool.**

**\*P for Power Point Presentation. Presentation was created by the said teacher especially for teaching purpose and for benefits of students. Additional material was used to prepare it.**

**\*\* Viva Voice is held in practical classes.**