**20CS1201-PYTHON PROGRAMMING**

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| **Course Category:** | | Professional Core | | **Credits:** | 3 | |
| **Course Type:** | | Theory | | **Lecture – Tutorial – Practical:** | 2-2-0 | |
| **Pre-requisite:** | | Basic mathematical knowledge to solve problems and programming | | **Sessional Evaluation: Univ.ExamEvaluation:**  **TotalMarks:** | 40  60  100 | |
| **Course Objective** | Students undergoing this course are expected: | | | | |
| * To learn the fundamentals of Python constructs. * To develop various simple programs using Python. * To define Python functions, exceptions and various other features. * To explore features of object oriented concepts. | | | | |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: | | | | |
| **CO1** | | Learn the basic building blocks of Python | | |
| **CO2** | | Understand the flow of execution, exception handling mechanism and functions for application development | | |
| **CO3** | | Study Strings, Lists and their applications | | |
| **CO4** | | Acquire knowledge in the concepts of Dictionaries, Tuples, and Sets. | | |
| **CO5** | | Comprehend the rules to construct regular expressions, and apply them to text to search for patterns and make changes. | | |
| **CO6** | | Understand Object-oriented programming paradigm in controlling the access of data and reducing the duplication of code by employing code reusability techniques. | | |

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| **Course Content** | | **UNIT-I**  **Why Python:** Thrust areas of Python, Open Source Software  **Python Basics**: Identifiers, Keyword, Statements and Expressions, variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input and Writing Output, Type Conversions, type() function and “is”operator, Dynamic and Strongly Typed Language  **UNIT-II**  **Control Flow Statements**: if and nested if, for, while Continue and Break statements, Catching Exceptions  **Functions:** Built-in Functions, Commonly Used Modules, Function Definition and Calling the function, The return statement and void function, scope and lifetime of variables, Default Parameters, Keyword Arguments, Variable number of arguments with \*args and \*\*kwargs, command line argument  **UNIT-III**  **Strings:** Creating and Storing Strings, Basic String Operations, Access characters by Index, Slicing and Joining of Strings, String Methods and Formatting Strings  **Lists:** Creating Lists, List operations, indexing and Slicing, Built-in Functions, List Methods, del() vs pop() |
|  | **UNIT-IV**  **Dictionaries:** Creation, accessing and modifying key-value pairs, built-in functions used on dictionaries, dictionary methods, del statement  **Tuples and Sets**: Creation of Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-in functions, Relationship among Tuples, Lists and Dictionaries, Tuple Methods, aggregation with zip(), Sets, Set Methods and Frozen sets  **UNIT-V**  **Files**: Types, Creating, Reading Text data and methods used for it, Manipulating Binary and CSV files, pickling (serialization of objects), os and os.path modules.  **Regular Expression Operations**: Using Special Characters, Regular Expression Methods,Named Groups in Python Regular Expression andRegular Expression with glob Module. **UNIT-VI**  **Object-Oriented Programming:** Classes and Objects and Creating them, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance, Polymorphism. |
| **Text Books & References:** | **Text Book(s):**   1. Gowrishankar. S, Veena.A, “Introduction to Python Programming”,CRC Press, Taylor and Francis group,2019.   **Reference Books:**   1. [Brian Heinold](https://1lib.in/g/Brian%20Heinold), [A Practical Introduction to Python Programming](https://1lib.in/book/5590130/66aa13). 2. [April Speigh,](https://1lib.in/g/April%20Speight)[Bite-Size Python: An Introduction to Python Programming](https://1lib.in/book/5827522/845c8a). Kenneth A. Lambert, Fundamentals of python - Data structures. 3. Mark Summerfield, Programming in python 3. 4. Yaswanth Kanetkar, Aditya Kanetkar,Let Us Python, BPB Publications, 2020 |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> 3. <https://wiki.python.org/moin/PythonBooks> |

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| Contribution of Course Outcomes towards achievement of Program Outcomes (3-High, 2-Medium, 1-Low) | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | - | 3 | 3 | - | - | - | - | 3 | 3 | - | - |
| CO2 | 3 | 3 | 2 | - | 2 | 2 | - | - | - | - | 3 | 3 | - | - |
| CO3 | 3 | 3 | 3 | - | 3 | 2 | - | - | - | - | 3 | 3 | - | - |
| CO4 | 3 | 3 | 2 | - | 2 | 2 | - | - | - | - | 2 | 2 | - | - |
| CO5 | 3 | 3 | 2 | - | 2 | 3 | - | - | - | - | 2 | 2 | - | - |
| CO6 | 3 | 3 | 2 | - | 2 | 2 | - | - | - | - | 2 | 2 | - | - |