**20CS1201 PYTHON PROGRAMMING**

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| **Course Category:** | Professional Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Pre-requisite:** | Basic mathematical knowledge to solve problems and programming | **Sessional Evaluation: Univ.Exam Evaluation:**  **Total Marks:** | 40  60  100 |

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| **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. |
| **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 arguments | |

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|  | **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 and Regular 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. Gowri shankar. S, Veena.A, “Introduction to Python Programming”,CRC Press, Taylor and Francis group,2019.   **Reference Books:** [Brian Heinold](https://1lib.in/g/Brian%20Heinold), [A Practical Introduction to Python Programming](https://1lib.in/book/5590130/66aa13).[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.  1. Mark Summer field, Programming in python 3. 2. 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> |