# 20CS1201 - PYTHON PROGRAMMING

(Common to CSE, IT, AI&DS, ECE & EEE Branches)

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| **Course Category:** | Professional Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-0-0 |
| **Prerequisite:** | Basic mathematical knowledge to solve problems and programming. | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | * 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.
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| **Course Outcomes** | Upon successful completion of this course 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 LanguageUNIT - 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 argumentsUNIT - 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 and References** | Text Books:1. Gowrishankar. S, Veena.A, “Introduction to Python Programming”, CRC Press, Taylor and Francis group,2019.
 |
| Reference Books:1. Brian Heinold, A Practical Introduction to Python Programming.
2. April Speigh, Bite-Size Python: An Introduction to Python Programming. 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
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| **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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**CO-PO Mapping:** 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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|   | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | 3 | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| **CO3** | 2 | 3 | - | - | 3 | - | - | - | - | - | - | - |
| **CO4** | - | 2 | - | 3 | 3 | - | - | - | - | - | - | - |
| **CO5** | - | - | 3 | - | 3 | - | - | - | - | - | - | - |
| **CO6** | - | 2 | 3 | 2 | 3 | - | - | - | - | 3 | - | 2 |