INTRODUCTION TO PYTHON PROGRAMMING

COURSE CODE: 20CA3102 **L T P C**

2 0 0 2

COURSE OUTCOMES:

At the end of the course, student will be able to

CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
CO2: Express proficiency in the handling of strings and functions.
CO3: Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO4: Identify the commonly used operations involving file systems and regular expressions.
CO5: Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.

UNIT –I: **(10 Lectures)**

Parts of Python Programming Language, Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language, **Control Flow Statements,** The if Decision Control Flow Statement, The if…else Decision Control Flow Statement, The if…elif…else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements, Catching Exceptions Using try and except Statement, **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, *args and **kwargs, Command Line Arguments.

Learning Outcomes:

At the end of the module, students will be able to

- Summarize features of python programming(L2)
- Use various data types and control statements in java(L3)

UNIT-II: **(10 Lectures)**

Strings, Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings, **Lists,** Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement.

Learning Outcomes:

At the end of the module, students will be able to

- Explain strings, operations (L2)
- Write python programs manipulating Strings(L6)

UNIT-III: (10 Lectures)

Dictionaries, Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, The del Statement, **Tuples and Sets,** Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip() Function, Sets, Set Methods, Traversing of Sets, Frozenset.

Learning Outcomes:

At the end of the module, students will be able to

- Demonstrate use of dictionaries (L2)
- Illustrate Built in functions , methods in dictionaries(L3)
- Write python programs(L6)

UNIT-IV: (10 Lectures)

Files, Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules, **Regular Expression Operations,** Using Special Characters, Regular Expression Methods, Named Groups in Python Regular Expressions, Regular Expression with glob Module.

Learning Outcomes

At the end of the module, students will be able to

- Understand the concept of Files (L2)
- Develop programs using regular Expression operations(L6)

UNIT-V: (10 Lectures)

Object-Oriented Programming, Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance, The Polymorphism

Learning Outcomes

At the end of the module, students will be able to

- Summarize Object oriented Programming features(L2)
- Develop Python Programs (L6)

TEXT BOOKS:

1. Gowrishankar S, Veena A, *"Introduction to Python Programming",* 1st Edition, CRC Press /Taylor & Francis, 2018. ISBN-13: 978-0815394372

REFERENCE BOOKS:

1. Jake VanderPlas, *"Python Data Science Handbook: Essential Tools for Working with Data"***,** 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
2. AurelienGeron, *"Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems"***,** 1st Edition,O'Reilly Media, 2017. ISBN – 13: 978-1491962299.
3. Wesley J Chun, *"Core Python Applications Programming"***,** 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365
4. Miguel Grinberg, *"Flask Web Development: Developing Web Applications with Python"***,** 2nd Edition, O'Reilly Media, 2018. ISBN-13: 978-1491991732.