

I. PROGRAMMING WITH PYTHON (CREDITS: 4)

Section - A

Unit I: Basic Programming Concepts with Python: Introduction, Need for programming languages, Programming languages, Examples of Programming languages, What is programming?, Getting to know Python, Features of Python Programming, Download, installation and run the first program with Python, How to download and install Python, Python for Mobile App Development

Unit II: Variables, Expressions and Statements, Data types and their values, Variables in Python, Differentiating variable names and keywords, Operators, Operands and Expressions, Interactive mode and script mode, Order of operations, Comments in programs.

Unit III: Control Structures: Selection structure, Iteration structures, Data structures, Functions: How to write a function definition in Python, Flow of execution, Functions with arguments, Void Functions, Functions with return statements, Built-in functions, Type Conversion functions, Math functions, Strings, Strings in Python, String methods, Parsing strings

Unit IV: Object Orientation as a Programming Paradigm, Overview of object-oriented programming (OOP), Basic concepts of objects and classes, Methods in Python, Classes and object declaration, Operator overloading, Object Oriented Concepts, Inheritance, Multiple inheritance, Data encapsulation, Polymorphism, Multiple inheritance and encapsulation, Error and exemption handling, errors, semantic errors, exceptions, exception handling

Unit V: Testing: Software testing, Testing Methods: Black box and White box, Testing Frameworks for Python, Example of Python Unit Testing, Debugging and Profiling: Finding and removing programming errors, Introduction to profilers

Unit VI: Handling data with python: Database, Database concepts, Introduction to SQLite, SQL CRUD statements, Introduction to database constraints, Role of Python in Mobile Application Development: Mobile Application Development Environments, Uses of Python in Mobile Application Development, Open Source Python Libraries, Kivy

Unit VII: Mobile Application Development with Python: Introduction, Android Mobile Application Development using Kivy, Buildozer Tool, Packaging with Python-for-android, Packaging your application for the Kivy Launcher, The Kivy Android Virtual Machine

Unit VIII: Python Graphical User Interface development: Introduction, Graphical User interface (GUI), Different types of packages for GUI development in Python, Tkinter (GUI toolkit that comes with Python), Creating GUI for Python with Tkinter, GUI with wxPython, Python GUI with WxFrame, GUI programming using kivy libraries: Introduction, Basic GUI programming (user password GUI), Kivy Layouts and Widgets, Kv language, Developing a Calculator using python and kivy, Develop a Calculator using python and kv language, GUI with check boxes.

