

| Module No. | Unit No. | Topics | Hrs. |
|--------------|----------|--|-----------|
| 1.0 | | Introduction to Python | 6 |
| | 1.1 | Introduction to Python, Installation and resources, Identifiers and Keywords, Comments, Indentation and Multi-lining, Variables (Local and Global), data types, Arithmetic, Comparative, Logical and Identity Operators, Bitwise Operators, Expressions, Print statement and Formats, Input Statements in python | |
| | 1.2 | Strings, Lists, Tuples, Dictionaries, Sets, Accessing Elements, Properties, Operations and methods on these data structures. | |
| | 1.3 | Decision Flow Control Statement: if and else statement, Nested If statement, Loop Statement: While Loop, do and while loop, for loop statement, Continue, Break and pass Statement, Conditional Statements | |
| 2.0 | | Functions and File I/O Handling | 8 |
| | 2.1 | Functions: Built-in-functions, library functions, Defining and calling the functions, Return statements, Passing the arguments, Lambda Functions, Recursive functions, Modules and importing packages in python code. | |
| | 2.2 | File Input/Output: Files I/O operations, Read / Write Operations, File Opening Modes, <i>with</i> keywords, Moving within a file, Manipulating files and directories, OS and SYS modules. | |
| 3.0 | | Object Oriented Programming | 9 |
| | 3.1 | Classes and Objects, Public and Private Members, Class Declaration and Object Creation, Object Initialization, Class Variables and methods, Accessing Object and Class Attributes. | |
| | 3.2 | Intricacies of Classes and Objects, Inheritance, Constructor in Inheritance, Exception Handling, Link list, Stack, Queues. | |
| 4.0 | | Graphical User Interface and Image processing | 9 |
| | 4.1 | Graphical User Interface using Tkinter Library module, creating simple GUI; Buttons, Labels, entry fields, widget attributes. | |
| | 4.2 | Database: Sqlite database connection, Create, Append, update, delete records from database using GUI. | |
| | 4.3 | Basic Image Processing using OpenCV library, simple image manipulation using image module. | |
| 5.0 | | Numpy, Pandas, Matplotlib, Seaborn, Scipy | 10 |
| | 5.1 | Introduction to Numpy, Creating and Printing Ndarray, Class and Attributes of Ndarray, Basic operation, Copy and view, Mathematical Functions of Numpy. | |
| | 5.2 | Introduction to Pandas, Understanding Dataframe, View and Select Data, Missing Values, Data Operations, File read and write operation. | |
| | 5.3 | Introduction to Matplotlib library, Line properties, Plots and subplots, Types of Plots, Introduction to Seaborn. | |
| | 5.4 | Introduction to Scipy, Scipy Sub packages – Integration and Optimization, Eigen values and Eigen Vectors, Statistic, Weave and IO. | |
| 6.0 | | Python Applications | 10 |
| | 6.1 | GUI based applications | |
| | 6.2 | Applications in Image Processing, Networking | |
| | 6.3 | Machine Learning, Linear Regression, Logistic Regression | |
| | 6.4 | Classification using K nearest neighbor, | |
| | 6.5 | Support Vector Machines | |
| Total | | | 52 |