Course Code	Course Name	Group	Teaching Scheme (Hrs/Week)		Credits
			Lectures	Practical	
0000000	Python Essential	PE	1	3	3

Course Objectives

1. To learn the concepts of python programming.
2. To provide in-depth knowledge python.
3. To learn how to build and create program for various applications in data science, Data Analysis, Data analysis.

Learning Outcomes

Upon completion of this course, the student should be able to

1. Create the programs in python for different application.
2. Perform cleansing on data and various functions and classes.
3. Enable students to programming in object-oriented programming.

Unit	Topics	Lectures
Unit I	**Introduction to Python** Introduction to Python, Need of Python, Introduction to general terms: Keywords, identifiers, statements & comments, Python Syntax and Indentation, Python variables, Python Data Types: Text, Numeric, Sequence, Mapping, Set, Boolean, Binary and None, Type Casting, I/O and import, Python operators, ~~Python Module~~ and Namespace. **Python Data Structures:** Array, List, Tuple, Set, Dictionary, Bag, stack, Queue. **Python Flow Control:** If-else, for and while loop, continue and break statement, pass, try catch statements. **Python Functions:** Functions and arguments, user defined function, static variables, Built-in functions, global local functions, recursive functions, Global keywords, Modules and Packages.	10
Unit II	**Python Object & Class:** Introduction of OPPs, class, object, encapsulation, Inheritance, polymorphism, Iterators, operator overloading. **Exception handling:** Difference between Syntax error and exception, try-except statement, finally block, Try with Else clause, raise Keyword, **Python File Handling** File formats: csv, tsv, xml and JSON, File handling: read, write, append and delete files.	10
Unit III	**Advance Python Programming** Regular Expression, abstract classes, constructors and destructors, decorators and Generators, Magic methods, Map, Flatmap and Lambda, Web Scraping using Python library like Beautifulsoup, OS Module **Python Library: Numpy** Arrays, Aggregation Functions, Array: indexing, slicing, copying, shaping, reshaping, splitting, searching, sorting and filtering, Array iteration, Random functions. **Python Library: Pandas**	10

	Pandas objects: Series, Dataframe and Index, series and dataframe methods: describe(), show() etc., Pivot Tables, Data Preparation, Data Cleansing: Missing Data, Outliers Detection, Data Wrangling, Combining Datasets, Aggregation and Grouping, Vectorized String Operations, report generation.	
Unit IV	**Visualization in Python** Introduction to Visualisation Libraries: Matplotlib, Seaborn and Bokeh, Introduction to Pyplot, Subplots, Formatting style of the Plot: Markers, Line, Labels axes, colors and Grid, Plotting with keyword Strings, Plotting with Categorical Variables, Scatter Plot, Gantt Chart, Heat Map, Box and Whisker Plot, Waterfall Chart, Area Chart, Pictogram Chart, Timeline, Highlight Table, Bullet Graph, Choropleth Map, Word Cloud, Network Diagram, Correlation Matrices. **Introduction to API** Introduction to Application Programming Interface, Types of Requests and Response Codes, Make a get request, request parameters, extract and display JSON data from an API. **Building and sharing applications using Streamlit** Streamlit installation, Data Modeling and Data Flow, API Reference: visualize, mutate, and share data, Creating and deploying app	10

References

1. "Programming Python, Book by Mark Lutz. "
2. "Fluent Python, Book by Luciano Ramalho."
3. "https://www.w3schools.com/python/default.asp"