



FACULTY OF PHARMACY
First Semester Bachelor of Pharmacy
In Effect from Academic Year 2026-27

Branch Name:	Bachelor of Pharmacy
Program Code:	PH101
Course Name:	Basics of Python Programming for Pharmaceutical Sciences (Theory)
Course Code:	1BP101T

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)		
Lecture	Tutorial	Practical	Credit	Theory (T)		Total Marks
				Continuous Assessment	University Assessment	
						Theory
2	-	NA	2	20	30	50

Course Objectives:

The objectives of this course are to:

1. Introduce the fundamentals of Python programming for pharmaceutical sciences.
2. Develop basic programming skills using control structures, functions, and data structures.
3. Provide knowledge of data handling techniques for structured dataset management.
4. Familiarize students with data analysis tools such as NumPy and Pandas for healthcare datasets.
5. Enable students to visualize and interpret pharmaceutical data.

Course Outcomes (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Explain the fundamentals of Python programming, including variables, data types, operators, and libraries.
2	Analyze program logic using control structures and functions.
3	Organize, manipulate, and retrieve data using data structures and file handling techniques.
4	Analyze pharmaceutical datasets using Python libraries.
5	Visualize and interpret pharmaceutical data using graphical tools.

Subject Contents:

Unit. No.	Topic	Total Hours (30 hours)	Weight (%)
1	Introduction to Python programming - Installing Python and an Integrated Development Environment (IDE) [Jupyter Notebook, PyCharm, VS Code etc.], Advantages of IDEs over text editors. - Python variables and data types (integers, floats, strings, booleans), Type casting and basic operators (arithmetic, comparison, logical), Input and output operations. - Basic string operations and manipulation techniques. Introduction to standard libraries and third-party libraries, installing and uninstalling libraries.	6	20
2	Control Structures & Functions	6	20

	• Conditional statements (if, if-else, if-elif-else), nested conditions • Loops (for loop, while loop). • Break and continue statements. • Defining and calling functions, passing arguments and returning values. • Writing modular programs for simple pharmaceutical applications- dosage calculation and BMI calculation.		
3	Data Structures & File Handling • Lists, tuples, and dictionaries. • Indexing and slicing lists, basic operations on lists and dictionaries, string manipulation techniques. • Introduction to NumPy arrays, basic operations using NumPy (array creation, arithmetic operations). • Reading and writing CSV files. • Understanding structured healthcare datasets. • Importing small pharmaceutical datasets and performing basic data access and manipulation tasks.	6	20
4	Data Handling with Pandas • Introduction to Pandas library. • Pandas Series and DataFrame structures. • Reading CSV and Excel files-PK study datasets and ADR reports • Inspecting datasets using functions such as head(), tail(), info(), and describe(). • Data cleaning techniques and handling missing values. • Filtering and selecting data based on conditions. • Grouping data and performing aggregation functions.	6	20
5	Data Visualization with Matplotlib • Introduction to Matplotlib. • Creating line plots, histograms, scatter plots, and box plots. • Labeling axes, titles, and legends. • Create plots and visualize pharmaceutical datasets - concentration-time curves for oral and IV administration, ADR reporting rates across drugs, dissolution profiles. • Scientific interpretation of plots.	6	20



1. **Futurecoder:** A completely open-source, interactive platform designed from scratch for absolute coding beginners. It stops you when you make a mistake, explains the error in simple terms, and includes a built-in debugger.
2. **FreeCodeCamp:** A massive open-source educational community. They offer comprehensive Python certifications like *Scientific Computing with Python* alongside free, multi-hour video courses on their freeCodeCamp YouTube Channel.
3. **HackInScience:** A 100% free and open-source platform that provides a clean, distraction-free environment packed with progressive Python exercises.