

ARSD College, University of Delhi

Model Course Handout/Lesson Plan

IIIrd Semester, 2022-23

Course Name: B.Sc. (H) Computer Science

Course Title: Programming in Python (BHCS19B)

Course Code: 32343307

Teacher/Instructors(s): Lokesh Kumar Shrivastav

Semester: 03 **Credit:** 04 (Theory: 02, Practical:02)

Session: 2022-2023

Course Objective:

- This course is designed to introduce the student to the basics of programming using Python.
- The course covers the topics essential for developing well documented modular programs using different instructions and built-in data structures available in Python.

Course Learning Outcomes:

On successful completion of the course, students will be able to:

- Develop, document, and debug modular python programs to solve computational problems.
- Select a suitable programming construct and data structure for a situation.
- Use built-in strings, lists, sets, tuples and dictionary in applications.
- Define classes and use them in applications.
- Use files for I/O operations.

Course Teaching Learning Process

- Use of ICT tools in conjunction with traditional class-room teaching methods
- Interactive sessions
- Class discussions
- Mini projects in the laboratory

Tentative weekly teaching plan is as follows:

Week	Topic
1	Python Programming: An Introduction Structure of a Python program, understanding Python interpreter/Python shell, indentation. Atoms, identifiers and keywords, literals, Python strings, arithmetic operator, relational operator, logical or boolean operator, bit wise operators.
2	Variables and Functions Python standard libraries such as sys and math. Variables and assignment statements. Built-in functions such as input and print.
3-4	Control Structures if conditional statement and for loop, While loop, break, continue, and pass statement, else statement. Infinite loop
5	Functions Function definition and call, default parameter values, keyword arguments, assert statement
6	Strings and Lists Strings-slicing, membership, and built-in functions on strings Lists- list operations.
7	Mutable object Lists- built-in functions, list comprehension, passing list as arguments, copying list objects.
8	Sets, tuples, and dictionary- associated operations and built-in functions

9	Testing and Debugging Determining test cases, use of python debugger tool- pydb for debugging
10	Searching and Sorting Linear search, binary search, selection sort, insertion sort, and bubble sort
11	Python 2D and 3D Graphics Visualization using graphical objects like point, line, histogram, sine and cosine curve, 3D objects
12	Errors and Exceptions Types of errors and exceptions, and exception handling
13	Errors and Exceptions Types of errors and exceptions, and exception handling
14	Classes Notion of class, object, and method.

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		25
	• Quiz		
	• Class Test		
	• Attendance		
	• Assignment		
	• presentations as announced by the instructor in the class		
2.	Practical Examination	4 hr	50
3.	End Semester Examination	3 hr	25

Details of the Course		
Unit	Contents	Contact Hours
I	Introduction to Programming using Python: Structure of a Python Program, Functions, Interpreter shell, Indentation. Identifiers and keywords, Literals, Strings, Basic operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment Operator, Bit wise operator).	
II	Building blocks of Python: Standard libraries in Python, notion of class, object and method.	
III	Creating Python Programs: Input and Output Statements, Control statements:-branching, looping, Exit function, break, continue and pass, mutable and immutable structures. Testing and debugging a program	
IV	Built-in data structures: Strings, lists, Sets, Tuples and Dictionary and associated operations. Basic searching and sorting methods using iteration and recursion.	
V	Visualization using 2D and 3D graphics: Visualization using graphical objects like Point, Line, Histogram, Sine and Cosine Curve, 3D objects	
VI	Exception Handling and File Handling: Reading and writing text and structured files, Errors and Exceptions.	
		Total
	Practicals: As per the guidelines provided by Department of Computer Science, University of Delhi	
Suggested Books:		

Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1.	Downey, A.B., Think Python—How to think like a Computer Scientist, 3rd edition. O'Reilly Media.	2015
2.	Taneja, S. & Kumar, N., Python Programming- A Modular Approach. Pearson Education.	2017

3.	Dromey, R. G., How to Solve it by Computer, Pearson Education.	2006
Mode of Evaluation:	Internal Assessment /Practical Examination/ End Semester Exam	