(Annexure I-2)

FACULTY OF COMPUTER SCIENCE & IT

SYLLABUS

For

BACHELOR OF SCIENCE (HONOURS) PHYSICS
Semester–III

(Under Continuous Evaluation System)

Session: 2023-24

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE PROGRAMME

BACHELOR OF SCIENCE (HONOURS) PHYSICS
(Session 2023-24)

BACHELOR OF SCIENCE (HONOURS) PHYSICS SEMESTER III								
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**				**Examination time (in Hours)**
				Total	**Ext.**		**CA**	
					L	**P**		
Python Programming	Bachelor of Science (Honours) Physics Semester III	BOPM-3135	C	50	25	15	10	3+3

Bachelor of Science (Honours) Physics Semester III

Session 2023-24

PYTHON PROGRAMMING

Course Code: BOPM-3135

Course Outcomes:

After completion of this course, the students will be able to:

CO1: Comprehend basics of Python programming like operators, data types, I/O, etc.
CO2: Apply various control statements and matrix operations using NumPy of Python Programming Language for designing solutions to different real world problems.
CO3: Implement various built-in and user defined function, packages and modules to solve mathematical problems.
CO4: Implement different file manipulation operations using Python.

Bachelor of Science (Honours) Physics Semester III

Session 2023-24

PYTHON PROGRAMMING

Course Code: BOPM-3135

Examination Time: (3+3) Hours

Max. Marks: 50
Theory: 25
Practical: 15
CA: 10

Instructions for the Paper Setters:

Eight questions of equal marks (05 marks each), (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT I

Introduction to python and Setting up the Python development Environment, Basic syntax, interactiveshell, editing, saving, and running a script, Concept of data types, Declaring and using Numeric data types: int, float, complex Lists and Tuples and their basic operations, Python console Input / Output. Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and In operators.

UNIT II

String Handling, Unicode strings, Strings Manipulation: - compare strings, concatenation of strings, slicing strings in python, converting strings to numbers and vice versa. Dictionaries Control statements: if-else, Nested If-Else, Loops (for, while) Loop manipulation using pass, continue, break and else.

Matrix operations using NumPy array (Multiplication. Addition, matrix multiplication, inverse, determinant, adjoint, Eigenvalues, etc).

UNIT III

Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Lamda function in python, Recursion, organizing python codes using functions, modules and external packages.

Case study of Projectile Motion.

UNIT IV

SciPy: Integration, differentiation and interpolation.

Files: manipulating files and directories, OS and Sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab separated) understanding readfunctions, read(), readline() and readlines() Understanding write functions, write() and writelines() Manipulating file pointer using seek. Introduction to graphics. **Plotting graphs and objects.**

References / Textbooks:

1. Mark Lutz, Learning Python, O'Reilly Media, 2013.
2. David Beazley, Python cookbook, O'Reilly Media, 2013.
3. David Beazley, Python Essential Reference, Addison-Wesley Professional, 2009.
4. John Zelle, Python programming: An Introduction to Computer Science, Franklin, Beedle & Associates Inc, 2004.
5. Alex Mortelli, Python in a Nutshell, O'Reilly Media, 2006.

Note: The latest editions of the books should be followed.