Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	**B.A. / B.Sc. (LIBERAL EDUCATION)**			**Year/ Semester:**	**3rd /5th**
Course Name	Python Programming Lab	**Course Code:**	CS301P	**Type:**	Practical
Credits	**01**			**Total Practical Hours:**	**30**
Evaluation Spread	**Internal Continuous Assessment:**	**10 Marks**		**End Term Exam:**	**15 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	• To provide a solid foundation in programming concepts and logic using Python as the primary language. • To learn the syntax and semantics of the Python language, including built-in data structures (such as lists, dictionaries, and tuples), operators, modules, and file handling. • To emphasize on problem-solving skills by presenting students with programming challenges and exercises. • To introduce students to Python libraries for data analysis and visualization.				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	Attributes
CO1	Develop a solid foundation in programming concepts and acquire proficiency in using Python.
CO2	Gain hands-on experience in writing Python code using correct syntax and effectively utilizing various libraries and modules.
CO3	Apply problem-solving techniques to solve programming challenges using Python.
CO4	Perform data manipulation and analysis using Python libraries.
Pedagogy	Interactive, discussion-based, student-centered, program outputs.
Internal Evaluation Mode	Experiment-Writing and Conductance File Maintenance/ Laboratory Record Continuous Attendance and Participation

Practical No.	Experiments	Contact Hours	Mapped CO
1.	• Programs demonstrating data types, variables, and expressions. • Programs demonstrating the use of conditional statements, loops, and arrays.	4	**CO1**
2.	• WAP to demonstrate list, tuples, and dictionary (indexing and iloc function). • Create functions that perform arithmetic operations. Also, create lambda function for the same.	6	**CO2**
3.	• WAP of list comprehensions, dictionary comprehensions, set comprehensions. • WAP of n x d arrays and perform slicing and other operation.	**6**	**CO2, CO3**

4.	• WAP of various mathematical and statistical functions. • WAP to demonstrate classes and objects, inheritance, constructor, managed attributes. • WAP to implement the Exception handling.	8	**CO4**
5.	• WAP using matplotlib to create histograms, density plots, scatter plots etc. • Create a Small game using the python mathematical packages.	6	**CO3, CO4**

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	1	1		2	1	2	2	1	2	3	2	1
CO2	2	3	1	1	1	2	2	1	1	2	1	2	1	1
CO3	3	2	3		1	1	2	2	2	2	2	1	2	2
CO4	1	2	3		1	1	1	3	2	1	1	2	1	1

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Reference Books	1. Python programming using the solving approach, Reema Thareja, Oxford University Press, 2nd Edition, 2017 2. Python for Data Analysis, Wes Mckinney, 1st edition, O'reilly media,2012.
E-Resources	• https://www.digimat.in/nptel/courses/video/106106126/L01.html • http://www.nitttrc.edu.in/nptel/courses/video/106106126/L02.html

Internal Practical Evaluation:

Component	**Marks**
Experiment-Writing and Conductance	5
File Maintenance/ Laboratory Record	2
Continuous Attendance and Participation	1
Viva-Voce	2
Total Marks	10

Course created by: Dr. Mohd Haleem

Signature:

Approved by: Prof. Mansaf Alam

Signature: