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

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|---|---|---|---|---|---|
| **Name of the Program** | **B.A. / B.Sc. (LIBERAL EDUCATION)** | | | **Year/ Semester:** | **3rd / 5th** |
| **Course Name** | **Python Programming** | **Course Code:** | **CS301** | **Type:** | **Theory** |
| **Credits** | **03** | | | **Total Sessions Hours:** | **45 Hours** |
| **Evaluation Spread** | **Internal Continuous Assessment:** | **40 Marks** | | **End Term Exam:** | **35 Marks** |
| **Type of Course** | ○ Compulsory | ◉ Core | | ○ Creative | ○ Life Skill |
| **Course Objectives** | 1. To define the basic structure and components of a Python program.<br>2. To learn sequential data types of Python.<br>3. To learn how to write functions and pass arguments in Python.<br>4. To learn how to design object-oriented programs with Python classes. | | | | |

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

| **Course Outcome (CO)** | **Attributes** |
|---|---|
| **CO1** | To understand the preliminary concepts of python language & syntax. |
| **CO2** | Able to use the sequential data types of Python. |
| **CO3** | Able to declare and define functions and module in Python. |
| **CO4** | Able to learn how to use object oriented programming and exception handling in Python applications for error handling. |
| **Pedagogy** | Interactive, discussion-bases, student-centered, presentation. |
| **Internal Evaluation Mode** | Mid-term Examination: 20 Marks<br>Class test: 05 Marks<br>Online Test/Objective Test: 05 Marks<br>Assignments/Presentation: 05 Marks<br>Attendance: 05 Marks |

| **Session Details** | **Topic** | **Hours** | **Mapped CO** |
|---|---|---|---|
| **Unit 1** | **Introduction to Python:** Installation and working with Python, understanding python basic data types, variables, operators, expressions, input and output statements.<br>**Data Types:** Declaring and using Numeric Data Types: int, float, complex Using string data type and string operations.<br><br>**Python Program Flow Control:** Conditional statements: if, if-else, if-elif-else statement,<br><br>**Looping statement:** for loops in python, for loop using ranges, use of while loops in python, loop manipulation using pass, continue, break and else. | 12 | CO1 |

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| **Unit 2** | **Sequential Data Types:** Accessing values in List-Delete, update List element-Basic List operations- Indexing, Slicing. Built in methods and Functions for List; Accessing values in Tuple, Basic Tuple operations Indexing, Slicing, Built in Functions for Tuple. Dictionary | 13 | CO2 |
| **Unit 3** | **Defining Function-** Declaration, definition and calling of functions, **Function Arguments**-Required arguments - Keyword arguments - Default arguments - Variable length arguments, Recursion.<br><br>**Modules and Packages:** organizing python code into modules, importing own module as well as external modules, Understanding Packages, | 10 | CO3 |
| **Unit 4** | **Python Object Oriented Programming:** OOPs Concept- Object, encapsulation, abstraction, inheritance, polymorphism, class, object and instances, access modifier, constructor, class attributes, inheritance: single inheritance, multiple inheritance, multi-level inheritance.<br><br>**Python Exception Handling** Avoiding code break using exception handling, safeguarding file operation using exception handling and helping developer with error code, programming using exception handling. | 10 | CO4 |

**CO-PO and PSO Mapping**

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

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

**Suggested Readings:**

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| **Text- Books** | 1. Programming with Java, E-Balagurusami, Tata McGraw Hill, 5th edition,2014<br>2. Peter Norton, "Peter Norton Guide to Java Programming", Techmedia Publications.<br>3. |
| **Reference Books** | 1. Java The Complete Reference, Herbert Schildt, TMH,9th Edition,2014<br>2. Java: How to program, Deitel, PHI,9th edition,2011<br>3. Dustin R. Callway, "Inside Servlets", Addison Wesley.<br>4. |
| **Para Text** | **Unit 1:**<br>• https://archive.nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs46/<br>**Unit 2:**<br>• https://archive.nptel.ac.in/noc/courses/noc21/SEM1/noc21-cs45/<br>**Unit 3:**<br>• https://www.digimat.in/nptel/courses/video/106106126/L01.html<br>**Unit 4:**<br>• http://www.nitttrc.edu.in/nptel/courses/video/106106126/L02.html |

| Recapitulation & Examination Pattern | | |
|---|---|---|
| **Internal Continuous Assessment:** | | |
| **Component** | **Marks** | **Pattern** |
| Mid Semester | 20 | **Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **0.5 Marks.**<br>**Section B:** Contains **07** descriptive questions out of which **05** questions are to be attempted. Each question carries **03 Marks**. |
| Class Test | 05 | Contains **05 descriptive questions.** Each question carries **01** Mark. |
| Online Test/ Objective Test | 05 | Contains **10 multiple choice questions.** Each question carries **0.5** Marks. |
| Assignment/ Presentation | 05 | Assignment to be made on topics and instruction given by subject teacher |
| Attendance | 05 | As per policy |
| **Total Marks** | **40** | |

**Course created by: Dr. Mohd Haleem**

**Signature:**

**Approved by: Prof. Mansaf Alam**

**Signature:**