



बिरसा मुंडा द्रायबल युनिवर्सिटी Birsā Mūṇḍā Drāyabala Yūnīvārsīṭī

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Computer Science

P.G.D.C.A. (Post Graduate Diploma in Computer Applications) Programme

Subject Code & Name: PGDCA201- Programming in Python

Teaching And Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
4	-	-	4	50%	-	50%	-

Programme Name	P.G.D.C.A.
Semester	1
Course Code	PGDCA201
Course Title	Programming in Python
Course Content Type (Th. / Pr.)	Th.
Course Credit	4
Sessions Per Week	4
Total Teaching Hours	60

Learning Objectives

Upon successful completion of this course, students will be able to:

- Understand the fundamental concepts of Python programming including syntax, variables, data types, operators, and control structures.
- Apply problem-solving techniques using conditional, iterative, and functional programming constructs.
- Develop modular and reusable programs using functions, recursion, and advanced Python features.
- Utilize Python collections and NumPy libraries for efficient data manipulation and numerical computation.



- Analyse real-world datasets using statistical functions and basic visualization techniques.
- Design and implement structured, readable, and maintainable Python applications.
- Evaluate alternative programming approaches and select appropriate data structures and algorithms for solving computational problems.
- Create practical Python-based solutions for scientific, business, and data-oriented applications.

Learning Outcomes

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

- Explain the fundamental concepts of Python programming including syntax, variables, data types, input-output operations, type conversion, and string manipulation techniques.
- Develop Python programs using arithmetic, logical, relational, and bitwise operators along with conditional and iterative control structures to solve computational problems.
- Utilize Python collections (Lists, Tuples, Sets, Dictionaries) and NumPy library functions for efficient data storage, manipulation, and statistical analysis.
- Analyse and implement modular programming concepts using user-defined functions, recursion, lambda expressions, decorators, and higher-order functions.
- Evaluate alternative programming approaches and select appropriate Python constructs, libraries, and data structures for solving real-world problems effectively.
- Design and develop structured, efficient, reusable, and maintainable Python applications by integrating multiple programming concepts and libraries.

CLO-PLO Mapping Matrix:

CLO / PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1	3	1	–	1	1	1
CLO2	2	3	1	3	2	1
CLO3	2	3	2	2	3	1
CLO4	2	3	2	3	2	2
CLO5	1	2	2	3	3	3
CLO6	2	3	2	2	3	3

Detailed Contents		
Unit	Topic/Sub Topic	Teaching Hours
I Python Fundamentals	Python Fundamentals: • Concepts of Interpreter based programming language • Structure of Python Programming language. • Python code Indention and execution • Python Variables (Naming of variables and Dynamic declaration of variables) • Comments in Python • Input, Output and Import Functions • Assigning values to multiple variables • Global variables Python Datatypes: • Text (str) • Numeric Type(int, float, complex) • Boolean (bool)) • Setting Datatypes • Type conversion (int, float, complex), casting (int, float, str) Python Strings: • Multiline string • String as character array • triple quotes • Slicing string • negative indexing • string length, concatenation • String Methods (centre, count, join, len, max, min, replace, lower, upper, replace, split)	15
II Operators, Conditional and Iterative Statements	Operators: • Arithmetic Operators • Comparison Operators • Assignment Operators • Bitwise Operators • Logical Operators • Membership Operators • Identity Operators • Operator Precedence Python conditional statements: • if statement, if..elif statement, if..elif...else statements, nested if Python Iterative statements: • while loop • nested while loop	15

	• break, continue statements. • for loop, range, break, continue, pass and Else with for loop, • nested for loop.	
III Python Collections and Array Handling	Python Collections: • Lists (Creating list, indexing, accessing list members, range in list, list methods (append, clear, copy, count, index, insert, pop, remove, reverse, sort)) • Tuples (Declaring tuple, indexing tuple, changing tuple values, adding and removing data from tuple, Use of tuple() method to create tuple, count() and index() methods) • Sets(declaring set, access set data, set methods (add, clear, copy, discard, pop, remove, union, update)). • Dictionary (Creating Dictionary, Adding, Accessing and Removing element ,Dictionary methods : get(), pop(), popitem(), clear(), copy()) Array handling using Numpy : • Overview of numpy • Numpy methods (Mean, Median, Mode, Standard Deviation and Variance) • Implementation of Numpy methods on numeric dataset created using list. • Introduction to data visualization.	15
IV Python Functions	Functions • Pass in Functions • Global and Local Variables • Recursion • *args and **kwargs in Function • First Class Function • Lambda Function • Map, Reduce and Filter Function • Inner Function • Decorators User defined function . • Defining function, Function with Parameters • Parameter with default value, Function with return value	15
Reference Books		

1. PYTHON PROGRAMMING, 3E by Reema Thareja , Publisher: Oxford University Press , ISBN-13 -978-9367257654
2. Python: The Complete Reference by Martin C. Brown (Author) , Publisher McGraw Hill Education, ISBN-13 : 978-9387572942
3. Ultimate Python Programming: Learn Python with 650+ programs, 900+ practice questions, and 5 projects by Deepali Srivastava (Author), Publisher : BPB Publications , ISBN-13 -978-9355516558
4. Core Python Programming : Covers fundamentals to advanced topics like OOPS, Exceptions, Data structures, Files, Threads, Net, 3ed by R. Nageswara Rao (Author) , Publisher Dreamtech Press , ISBN-13 - 978-9390457151
5. Learning with Python by Allen Downey (Author), Jeffrey Elkner (Author), & 1 More, Publisher Dreamtech Press, ISBN-13- 978-9351198147

Web References:

1. <https://docs.python.org/3/tutorial/index.html>
2. <https://www.geeksforgeeks.org/python/python-programming-language-tutorial/>
3. <https://www.w3schools.com/python/>
4. <https://www.tutorialspoint.com/python/index.htm>

L:: Lecture, **T::** Tutorial, **P::** Practical

CCE:: Continuous & Comprehensive Evaluation

(CCE theory includes Mid Semester Examination, Assignment, MCQ Quizzes, Seminar, Reflective Notes, Class Participation, Case Analysis and Presentation, Slip Tests (Announced/ Surprised), Attendance etc. or any combination of these)

PWE: Practical Work Examination

(PWE includes Laboratory Practical Work, Project Work, Viva simulation exercise work etc.)

SEE:: Semester End Evaluation

