

**B.Sc. Prog. Computer Science Sem III**

**DSE 01a: Python Programming for Data Handling**

(Admission 2022 onwards)

	TOPICS/UNITS	Chapter	Ref
Week 1 to 5	<p><b>Unit 1 (15 Hours)</b>  <b>Introduction to Python Programming, Basic Constructs, and Python Built-in Data Structures:</b> Introduction to Python programming language, Basic syntax, variables, and data types in Python, Functions and modular programming; Conditional statements (if, elif, else); Looping structures (for and while loops); Mutable and Immutable Data Structures, Strings- Indexing, slicing, traversal, operations; Lists-indexing, slicing, traversal, operations; tuples, dictionaries, and sets and their operations in Python.</p>	Ch. 1, Ch. 2, Ch. 3, Ch. 6, Ch. 7	[1]
Week 6 to 7	<p><b>Unit 2 (5 Hours)</b>  <b>File Handling:</b> Opening, reading, writing, and closing files; File modes and file object methods; Reading and writing text and binary files; Working with CSV files</p>	<p><b>Ch. 9:9.1,9.2</b>  <b>Online reference :1</b>                      [ csv.reader() and csv.writer(), dictReader() and dictWriter()]  <b>Online reference 2</b>[7.2 Reading and Writing files, 7.2.1]</p>	[1]
Week 8 to 12	<p><b>Unit 3 (15 Hours)</b>  <b>Designing GUI Applications with Tkinter (15):</b> What is Tkinter? Creating a Tkinter window, Layout managers, Tkinter widgets -Entry, Spinbox, Combobox, Checkbutton, Text, Button, LabelFrame; Implementing the application - LabelInput class, building of form, adding LabelFrame and other widgets, retrieving data from form, resetting form, building our application class.</p>	<b>Ch. 1, Ch. 2, Ch. 3 (Till Reset Function)</b>	[2]
Week 13 to 15	<p><b>Unit 4 (10 Hours)</b>  <b>Combining Python file handling and Tkinter:</b> Creating a simple Tkinter application, Reading and writing to csv files in a Tkinter application.</p>	<b>Ch. 3 (The Save callback)</b>	[2]

## References

1. Taneja S., Kumar, N. Python Programming- A modular approach, 1st Edition, Pearson Education India, 2018,
2. Moore, Alan D. Python GUI Programming with Tkinter: Develop responsive and powerful GUI applications with Tkinter. Packt Publishing Ltd, 2021.

## Additional References:

1. Guttag, J.V. Introduction to computation and programming using Python, 2nd edition, MIT.

## Online references/material:

1. <https://docs.python.org/3/library/csv.html>
2. <https://docs.python.org/3/tutorial/inputoutput.html#reading-and-writing-files>.

## Suggestive Practice Questions:

Installing and setting up Python and relevant libraries; Python development environments (e.g., Anaconda, Jupyter Notebook)

1. Write a Python program to calculate the factorial of a number.
2. Write a Python program to generate prime numbers between 1 to n, where n is provided as input by the user.
3. Write a Python program to find the sum and average of numbers of a given list.
4. Given two sets, set1 and set2, write a Python program to find their union, intersection, and difference.
5. Given a list of numbers, write a Python program to count the number of times an element occurs in a list and create a dictionary with *element:count* as *key:value* pairs.
6. Write a Python program to swap the first two and last two characters of a given string.
7. Write a Python program to create a text file having names of ten Indian cities.
8. Write a Python program to create a text file having atleast five lines about your college using `writelines()` function.
9. Write a Python program which reads the data from three input files having Employee Names and merges them into one output file.
10. Write a Python program to count the number of vowels in a file and write the *vowel: count* in a dictionary.
11. Write a Python program to create a CSV file having student data: Roll\_No, Enrollment No, Name, Course, Semester.
12. Write a Python program library to read the CSV file created in the above program and filter out records of II semester students.
13. Write a Python program using tkinter library to create a GUI to enter registration details for an event.
14. Write a Python program using tkinter library to create a calculator to perform addition, subtraction, multiplication, and division of two numbers entered by the user.
15. Write a Python program using tkinter library to create an age calculator to calculate age when DOB is entered.
16. Write a Python program using tkinter library to read and write student details namely Roll\_No, Enrollment\_No, Name, course, Semester through a form and write the entered details to a CSV file.

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