

# Semester IV

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| <p align="center"> <b>Savitribai Phule Pune University</b><br/> <b>S.Y.B.Sc. (Computer Science) - Sem – IV</b><br/> <b>Course Type: VSC</b><br/> <b>Course Code: CS-271-VSC-P</b><br/> <b>Course Title : Advance Python Programming</b> </p>   |  |   |
| <p align="center"> Teaching Scheme<br/> 04 Hrs/ week </p>  | <p align="center"> No. of Credits 2 </p> | <p align="center"> Examination Scheme<br/> IE : 15 marks<br/> UE: 35 marks </p> |
| <p><b>Prerequisites -</b></p> <ul style="list-style-type: none"> <li>• Basic Python Programming Knowledge</li> <li>• Basic Understanding of pattern matching and String operations</li> <li>• Knowledge of file handling</li> </ul>  |  |   |
| <p><b>Course Objectives</b></p> <ul style="list-style-type: none"> <li>• Understand and manipulate operations on data in Python</li> <li>• Develop the ability to write reusable functions to organize code better and improve efficiency.</li> <li>• Learn to structure their programs using functions and modules to improve readability and maintainability.</li> </ul>         |  |   |
| <p><b>Course Outcomes</b></p> <p>On completion of the course, student will be able to–</p> <p>CO1: Read and write data from &amp; to files in Python.</p> <p>CO2: Express proficiency in the handling of strings and functions</p> <p>CO3: Identify the commonly used operations involving file systems and regular expressions.</p> <p>CO4: Develop application using python.</p> |  |   |
| <p><b>Course Contents</b></p>  |  |   |
| <b>Assignment 1</b>  | <b>Data Frame</b>                        | <b>1 Slot</b>   |
| <ul style="list-style-type: none"> <li>• Creating Data Frame - User define, using csv file</li> <li>• View Data Frame</li> <li>• Preprocessing on Data Frame - Null Values, Duplicate values</li> <li>• Modify Data in DataFrame</li> <li>• Grouping and Aggregating Data</li> <li>• Merging and Joining DataFrames</li> </ul>   |  |   |

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| <b>Assignment 2</b>   | <b>Functions in Python</b>                  | <b>2 Slots</b> |
| <ul style="list-style-type: none"> <li>• Creating user defined functions</li> <li>• Calling a function</li> <li>• Function Arguments</li> <li>• Return Statement</li> <li>• Functions returning multiple values</li> <li>• Anonymous Functions</li> <li>• Recursive Functions</li> </ul>  |   |                |
| <b>Assignment 3</b>   | <b>Iterators &amp; Generators in Python</b> | <b>2 Slots</b> |
| <ul style="list-style-type: none"> <li>• Function ducktyping</li> <li>• List comprehension</li> <li>• Unpacking argument list</li> <li>• Creating Iterator</li> <li>• Creating Generator</li> </ul>   |   |                |
| <b>Assignment 4</b>   | <b>Modules</b>                              | <b>1 Slot</b>  |
| <ul style="list-style-type: none"> <li>• Importing module</li> <li>• Creating &amp; exploring modules</li> <li>• Math module</li> <li>• Random module</li> <li>• Time module</li> </ul>   |   |                |
| <b>Assignment 5</b>   | <b>Packages</b>                             | <b>1 Slot</b>  |
| <ul style="list-style-type: none"> <li>• Importing package</li> <li>• creating package</li> </ul>   |   |                |
| <b>Assignment 6</b>   | <b>Working with Files</b>                   | <b>2 Slots</b> |
| <ul style="list-style-type: none"> <li>• Creating files and Operations on files (open, close, read, write),</li> <li>• File object attributes,</li> <li>• file positions,</li> <li>• Listing Files in a Directory,</li> <li>• Testing File Types,</li> <li>• Removing files and directories,</li> <li>• copying and renaming files</li> </ul> |   |                |

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| <b>Assignment 7</b>  | <b>Regular Expression</b> | <b>2 Slots</b> |
| <ul style="list-style-type: none"><li>• Concept of regular expression,</li><li>• various types of regular expressions</li><li>• function related to regular expressions.</li></ul> |                           |                |
| <b>Assignment 8</b>  | <b>Exception Handling</b> | <b>1 Slot</b>  |
| <ul style="list-style-type: none"><li>• Built-in Exceptions</li><li>• Handling Exceptions</li><li>• Exception with Arguments</li><li>• User-defined Exceptions.</li></ul>          |                           |                |

**Note: 1 Slot = 4 Hours**