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**Session: 2021-2022 ECE**

Name if the faculty : Mr Neeraj Chawaria

Discipline : ECE

Semester : 6th Sem

Subject : Python Programming

Duration : 15 weeks (May- Aug.-2021)

Work Load (Lecture/ Practical) per week (in hours): Lecture-03, Practical-02

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| Unit | Topic | Reference | No. of Hours |
| I | **Introduction:** Fundamental ideas in computer science; modern computer systems, installing Python; basic syntax, interactive shell, editing, saving, and  running a script; | Book 1 – ch 1  Book 2 – ch 1 | 1 |
|  | The concept of data types; variables, assignments; numerical types; arithmetic operators and  expressions; comments in the program; | Book 1 – ch 2  Book 2 – ch 2 | 1 |
|  | understanding error messages; Control statements: if-  else, loops (for, while) | Book 1 – ch 2  Book 2 – ch 3 | 1 |
| 2 | **Strings, text files**: String manipulations: subscript  operator, indexing, slicing a string;. | Book 1 – ch 2  Book 2 – ch 4 | 2 |
|  | strings and number system: converting strings to  numbers and vice versa | Book 1 – ch 2  Book 2 – ch 4 | 1 |
|  | Binary, octal, hexadecimal numbers; | Book 2 – ch 4 | 1 |
|  | text files: reading/writing text and numbers from/to a  file; | Book 2 – ch 4 | 2 |
|  | creating and reading a formatted file (csv or tab-  separated). | Book 2 – ch 4 | 1 |
| 3 | **Lists, dictionary and Design with functions:** Basic list  operators, | Book 1 – ch 3  Book 2 – ch 5 | 1 |
|  | replacing, inserting, removing an element; | Book 1 – ch 3  Book 2 – ch 5 | 2 |
|  | searching and sorting lists; | Book 1 – ch 3  Book 2 – ch 5 | 2 |
|  | Dictionary literals, adding, and removing keys,  accessing and replacing values; traversing dictionaries. | Book 1 – ch 3  Book 2 – ch 5 | 2 |
|  | Hiding redundancy, complexity; arguments and return  values; | Book 1 – ch 3  Book 2 – ch 5 | 2 |

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|  | Program structure and design. | Book 1 – ch 4  Book 2 – ch 6 | 1 |
|  | Recursive functions. | Book 1 – ch 4  Book 2 – ch 6 | 1 |
| 4 | **Object Oriented concepts:** Classes and OOP: classes,  objects, attributes and methods; | Book 1 – ch 5  Book 2 – ch 8 | 1 |
|  | defining classes; design with classes, | Book 1 – ch 5  Book 2 – ch 8 | 1 |
|  | data modelling; persistent storage of objects, | Book 1 – ch 5  Book 2 – ch 8 | 1 |
|  | Inheritance, | Book 1 – ch 5  Book 2 – ch 8 | 2 |
|  | polymorphism, operator overloading; abstract classes; | Book 1 – ch 5  Book 2 – ch 8 | 2 |
|  | exception handling, try block. | Book 1 – ch 5  Book 2 – ch 1 | 2 |

**Suggested books:**

1. “Python with Machine Learning” Dr. A Krishna Mohan, S. Chand , 2019
2. “Fundamentals of Python: First Programs” Kenneth Lambert, Course Technology, Cengage Learning, 2012
3. “Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”,By Charles Dierbach, John Wiley & Sons, December 2012,