Syllabus

First Semester Courses in Information Technology

2023-2024

Contents:
- Syllabus for Skill Enhancement Courses:
    - USITY4501SE1: Introduction to Python Programming

- Evaluation and Assessment guidelines

F.Y. B. Sc (Information Technology)

Cours Code: USITY4501SE1

Title: Introduction to Python Programming

Credits:2 (for Theory 1 (Total 15 hr) and Practical 1 (Total 30 hr)

To learn basic programming fundamentals using Python and to understand various data structures in Python.

Course outcomes:

On completing the course, the student will be able to:

1. Develop the skill to create basic applications using Python.
2. Acquire solid foundation of the Python programming language, including its syntax and core features.
3. Develop programs that use variables, data types, and control structures effectively

Unit 1   15

Introduction to Python: Python overview, Modes of Programming in Python, installing Python, Algorithm and Flowcharts.

Data Types & Variables: Statements & Expressions, Variables, Integers & Floats, Strings.

Conditional Statements and Control flow: Conditional Statements and Loops.

Unit 2   15

Data Structures & Attributes: Functions & Methods, Lists, Tuples and dictionaries, Indexing & Slicing.

Modules and Imports, Packages.

List of Recommended Reference Books

1. E Balagurusamy (2018). Programming for Problem Solving. McGraw Hill Education India Private Limited
2. Harsh Bhasin. (2019). Python basics. Dulles Mercury Learning and Information.
3. Kanetkar Yashavant. (2019). Let Us Python. BPB Publications.

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Practical:

1. Programs on data types and variables
2. Programs on Strings
3. Programs on conditional statements
4. Programs on Loops
5. Programs on Pattern
6. Programs on List and Tuple
7. Programs on dictionaries
8. Programs on modules and Packages.

ASSESSMENT:

THEORY:
CIA I: Written test **for 20 marks**
                    OR
Assignments / Project / Presentation / Case Study **for 20 marks**

End semester Practical Exam :30 marks

APPROVED SYLLABUS

Syllabus

Second Semester Courses in Information Technology

2023-2024

Contents:
- Syllabus for Skill Enhancement Courses:
  - USITY4502SE1: Advanced Python Programming

- Evaluation and Assessment guidelines

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F.Y. B. Sc (Information Technology)

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Course code: USITY4502SE1
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Title: Advanced Python Programming

Credits:2 (for Theory 1 (Total 15 hr) and Practical 1 (Total 30 hr)

Course Objectives:
To learn fundamentals of NumPy and Pandas library and to understand data Science tools and plot data using appropriate Python visualization libraries along with fundamentals of object-oriented programming

Course outcomes:

On completing the course, the student will be able to:

1. Understand advanced Python programming concepts and techniques, building on their foundational knowledge.
2. Develop the skills to use NumPy for numerical computing and data manipulation in Python.
3. Develop the skill of data analysis and manipulation using the panda's library.

Unit 1   15

Object-Oriented Programming: Overview of OOP, Classes and Objects, Objects as Arguments, Objects as Return Values, Inheritance, Data Encapsulation,

NumPy: Introduction to NumPy, NumPy basics, NumPy Attributes and Functions, NumPy Attributes and Functions, Creating Arrays from Existing Data, Creating Array from Ranges, Indexing and Slicing in NumPy, Advanced Slicing in NumPy, Append and Resize function, NumPy Matrix Library.

Unit 2   15

Pandas: Introduction to Pandas, Panda's data structures – Series and Data Frame, Data wrangling using pandas: Loading a dataset into a data frame Selecting Columns from a data frame, Selecting Rows from a data frame, adding new data in a data frame, deleting data from a data frame, data preprocessing using some real time Datasets...

Data Visualization using matplotlib: Plotting with Matplotlib, Scatter plot, Line plot, Bar plot, Histogram, Box plot.

List of Recommended Reference Books

1. Python Made Easy: Step by Step Guide to Programming and Data Analysis using Python for Beginners and Intermediate Level. (2020). (n.p.): Notion Press.
2. Josef, J., Lal, S. P. (2016). Introduction to Computing & Problem Solving With PYTHON.India: Khanna book publishing Company (P) Limited.

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Practical:

1. Programs on classes and objects
2. NumPy basics
3. NumPy Arrays
4. Indexing and Slicing in NumPy
5. Pandas Series
6. Pandas Data Frames
7. Programs on Data Preprocessing
8. Data Visualization using matplotlib

ASSESSMENT:
THEORY:
CIA I: Written test **for 20 marks**
           OR
Assignments / Project / Presentation / Case Study **for 20 marks**

End semester Practical Exam :30 marks

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