**CONTENT PLAN FOR RECESS TRAINING**

**BSSE2301 SOFTWARE ENGINEERING MINI PROJECT 2023**

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| **TOPIC** | **SUB-TOPICS** | **WEEK 1 (Mon, Tue, Thursday)** |
| Introduction to Python | * Why Python? * Python installation * Syntax and comments * Variables and datatypes * Numbers, castings, strings, Booleans, operators, lists, tuples, sets and dictionaries * Python if statements * Python for and while loops * Arrays * Classes/objects * Inheritance * Iterators * User input * Python PIP [Exercises 2] |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 2 (Mon, Tue, Thursday)** |
| Python Basics | * Running Python programs * Python interpreter and interactive mode * Variables and data types * Basic operators and expressions * nput and output operations |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 2 (Mon, Tue, Thursday)** |
| Control Flow | * Conditional statements (if, elif, else) * Looping statements (for, while) * Control flow keywords (break, continue, pass) * Exception handling (try, except, finally) |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 3 (Mon, Tue, Thursday)** |
| Data Structures | * Lists and tuples * Dictionaries and sets * Strings and string manipulation * Arrays and matrices (NumPy) |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 4 (Mon, Tue, Thursday)** |
| Functions and Modules | * Defining and calling functions * Function arguments and return values * Scope and namespaces * Modules and importing * Standard library and external modules |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 5 (Mon, Tue, Thursday)** |
| Object-Oriented Programming (OOP) | * Introduction to OOP concepts * Classes and objects * Inheritance and polymorphism * Encapsulation and data hiding * Class methods and instance methods |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 6 (Mon, Tue, Thursday)** |
| * File Handling and Input/Output | * Reading from and writing to files * File modes and file objects * Working with text and binary files * Error handling and exception handling |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 7 (Mon, Tue, Thursday)** |
|  | * Creating a Receipt Printing Program |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 8 (Mon, Tue, Thursday)** |
| Python Libraries and Frameworks | * Introduction to popular libraries (e.g., NumPy, Pandas, Matplotlib) |  |
| Installation and understanding of Jupyter Notebook | * What is Jupyter Notebook? * Setup Jupyter Notebook [Two simple Practice Exercises] * Three components of Jupyter Notebook. |  |
| Introduction to data analysis, manipulation and visualization with Pandas | * Introduction to data analysis * What it is. * How data is analyzed * Different types of data analysis * Introduction to Pandas * Installation of Pandas * Series * Data Frames * Read CSV * Read JSON * Analyzing Data [Two Simple Exercises] * Cleaning Data * Correlations * Plotting |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 9 (Mon, Tue, Thursday)** |
| Python Libraries and Frameworks | * Data science and machine learning libraries (e.g., TensorFlow, scikit-learn) |  |
| **TOPIC** | **SUB-TOPICS** | **WEEK 10 (Mon, Tue, Thursday)** |
| Web development frameworks | * Web development frameworks (e.g., Django, Flask) |  |