جامعة حمدان بن محمد الذكية
Hamdan Bin Mohammed Smart University

Course Name: Introduction to Programming
Course Code: PROG101
Semester: Fall 2024

WEEK # 12

Week's Topic(s)	**The Pandas Library for Data Analysis** • Utilize the Pandas Library for Data Analysis. • Apply Python techniques to filter rows of a pandas DataFrame by conditions. • Apply Python techniques to sort and group a Pandas DataFrame.
Link to Course Learning Outcomes	• **AR1**: Demonstrate knowledge of data analysis techniques using Python. • **AR2**: Apply Python for data manipulation and analysis, including filtering, sorting, and grouping.
Weekly Learning Outcomes	***At the end of this week, learners will be able to:*** 1. Use the Pandas library to filter data based on conditions. 2. Perform sorting and grouping of data within a DataFrame. 3. Apply multiple conditions to slice data and analyze the results.v

WEEK 11 – SESSION 1 (SYNCHRONOUS/VIRTUAL)

Delivery Mode	**Synchronous / Virtual**
Session Topic(s)	The Pandas Library for Data Analysis • Filtering rows using conditions. • Sorting data in ascending and descending order. • Grouping data by columns.
Link to Course Learning Outcomes	• **AR1**: Demonstrate knowledge of data analysis techniques using Python. • **AR2**: Apply Python for data manipulation and analysis.
Session Learning Outcomes	***At the end of this synchronous session, learners will be able to:*** • Filter rows in a Pandas DataFrame using various conditions. • Sort data based on one or more columns. • Group data and apply aggregation functions.

Teaching & Learning Resources	• Python environment (e.g., Jupyter Notebook) • Pandas library documentation and tutorials • Sample datasets for practice • Slides and handouts on filtering, sorting, and grouping data
Activities	• Live coding session: Loading and exploring data with Pandas. • Hands-on exercises: Slicing data and performing aggregation. • Group discussion: The role of statistics in data analysis.
Assessment	• In-class task: Load and analyze a dataset using Pandas commands

WEEK 1 – SESSION 2 (ASYNCHRONOUS/SELF-PACED)

Delivery Mode	**Asynchronous / Self-Paced**
Session Topic(s)	Advanced Data Slicing and Grouping: 1. Slicing data using multiple conditions. 2. Grouping data and performing advanced aggregations.
Link to Course Learning Outcomes	• **AR1**: Demonstrate knowledge of data analysis techniques using Python. • **AR2**: Apply Python for data manipulation and analysis.
Session Learning Outcomes	***At the end of this self-paced session, learners will be able to:*** 1. Slice data using multiple conditions in a DataFrame. 2. Group data by columns and apply various aggregation functions.
Teaching & Learning Resources	• Pre-recorded video tutorials on slicing data in Pandas. • Online articles on data cleaning and manipulation. • Sample scripts and datasets for practice. • Discussion forums for peer collaboration.
Activities	• Individual exercises: Slicing data and calculating statistics. • Case study: Perform aggregation on a real-world dataset. • Forum participation: Share insights and discuss challenge
Assessment	• Submit a Python notebook showcasing data slicing and aggregation. • Reflection report on the importance of data analysis for decision-making.