

(There will be weekly assignments/homework, students must do such work. The given assignments will be a review of the accumulated information they have learned, as well as the new stuff taught each week.) Not doing hwk for a week, will have consequences such as more work the following week, failure to do so we will talk to parents.)

## **Python**

### **Week 1: Introduction to Python**

- Overview of Python and its applications
- Installing Python and setting up IDEs (PyCharm, VSCode, etc.)
- Basic syntax: variables, data types, and operators
- Input and output functions

### **Week 2: Control Structures**

- Conditional statements (if, elif, else)
- Loops: for and while
- Break and continue statements

### **Week 3: Functions**

- Defining and calling functions
- Function arguments and return values
- Lambda functions/recursion

### **Week 4: Data Structures**

- Lists and list comprehensions
- Tuples, sets, and dictionaries
- Common operations and methods for each data structure

### **Week 5: Data Manipulation and Analysis**

- Introduction to NumPy for numerical operations
- Introduction to pandas for data manipulation
- Dataframes: creation, indexing, and manipulation

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- Basic data analysis: grouping, aggregation, and summarization

## **Week 6: Object-Oriented Programming (OOP)**

- Classes and objects
- Attributes and methods
- Inheritance and polymorphism
- Encapsulation and abstraction

## **Week 7: Error Handling and Debugging**

- Exception handling with try, except, finally
- Custom exceptions
- Debugging techniques and tools

## **Week 8: Preparing for Certification/Final Review**

- Review of all topics
- Practice certification test questions