

# Advance Programming

## (L2,T1,P1)

**Fundamental concepts:** Literals, variables and identifiers, operators, expressions and data types; Control structures: Boolean expressions, selection control, iterative control; Lists: List structures, Lists, (sequences), iterating over lists; Functions: Program routines, calling value-returning functions, calling non value-returning functions, parameter passing, variable scope; Dictionaries and Sets; Recursion; Text Files: Using text files, string passing, exception handling. Object oriented programming with python: Methods vs Functions, Magic (Dunder) Methods in Python, Classes in Python, Python Objects, Inheritance in Python, Python Multiple Inheritance, Python Operator Overloading, Generators in Python, Python Serialization with pickle, Python property Decorator

**Pandas:** Dataframe Series , Writing to Files, Adding & Reseting Columns, Mapping with Functions, Rolling Calculations, Basic DateTime Indexing, Data Maintenance, Adding/Removing Columns and Rows, Basic Grouping, Concepts of Aggregate Functions, operation : outer join, inner join, left outer join, right outer join, filtering, membership operator, null identifier operator, Look Ups, Selections, and Indexing, Advanced Indexing Options, Handling NaN Values, Reindexing, Filling Methods and Series Addition, Series Multiplication, and Mapping, pandas.IO.Data, Panels and Hierarchical Indexing, Advanced Reading Csvs/HTML, Binning, Categorical Data, Advanced Groupings and Aggregate Functions, Missing Values and solutions, Other library: NumPy, SciPy, PyQt.

### Textbooks:

- Charles Dierbach, Introduction to computer science using Python a computational problem solving focus, *John-Wiley & Sons, 2012.*
- pandas: powerful Python data analysis toolkit, *Wes McKinney and the Pandas Development Team*