Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
ECON222	Computer programming	4	4	0	0	4	5

Prerequisites	
Admission Requirements	

Language of Instruction	Turkish
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	The aim of this course is to assist students in the Department of Economics in acquiring computational thinking and data processing skills that are aligned with the requirements of the digital age by introducing the fundamental concepts of programming. Students will develop their computational thinking abilities through algorithms and flowcharts, while gaining hands-on experience in the software development process using the Python programming language. In addition to fundamental data structures such as data types, lists, tuples, sets, and dictionaries, students' problem-solving skills will be enhanced through the use of decision structures, loops, and functions. Furthermore, through libraries such as NumPy, Pandas, and Matplotlib, students will develop competencies in data analysis, visualization, and interpretation.

Content	Introduction to Programming and Fundamental Concepts * Computational thinking * What is an algorithm and how is it designed? * Flowcharts * Software development process General Overview of Programming Languages * Introduction to the Python Programming Language * What is Python? * Compiler and interpreter concepts * IDE usage and installation * Introduction to the Python interface Data Types and Basic Structures * Numerical data: Integers, Floats * Text data: Strings * Logical data: Booleans * Variable definition and usage * Operators: arithmetic, comparison, logical Decision Structures, Loops, and Error Handling * if, else, elif structures * Nested decision structures * while and for loops * Use of break and continue in loops * Range and enumerate functions * Types of errors * Exception handling blocks Functions * Functions with and without parameters * Return statement * Lambda expressions * Recursive functions Data Structures * Lists * Tuples * Sets * Dictionaries Python Standard Libraries * Math module * Random module * Datetime and Time modules File Operations * File creation, writing, and reading * File updating and control functions Data Analysis and Visualization Libraries * NumPy: Numerical computations * Pandas: Data analysis and data frames * Matplotlib: Plotting and data visualization

References	The course materials for each week will be uploaded to the Moodle course page under the relevant week. The following resources may be used as supplementary (optional) materials to support the main course resources: Yıldız, B. Python Projeleri ve Popüler Kütüphaneler (3rd. Ed.) Tungut, H. B. Algoritma ve Programlama Mantığı (23rd Ed.) Taşçı, V. Python Eğitim Kitabı (4rd Ed.) Kalb, I. Learn to Program with Python 3. Sweigart, Al. The Big Book of Small Python Projects: 81 Easy Practice Programs Matthes, Eric. Python Crash Course, 3rd Edition: A Hands-On, Project-Based Introduction to Programming. Tuckfield, Bradford. Dive into Algorithms: A Pythonic Adventure for the Intrepid Beginner.

Theory Topics

Week	Weekly Contents
1	Introduction to Programming: Algorithms and Flowcharts
2	Introduction to Python
3	Conditional Statements
4	Loops, Error Handling
5	Functions
6	Strings
7	List
8	Tuple
9	Set
10	Dictionary
11	File Handling
12	Standard Libraries
13	Python Libraries and Applications
14	Python Libraries and Applications