

School of Engineering and Natural Sciences / Computer Engineering (English)

2022 - 2023 Academic Year

PYTHON PROGRAMMING for ENGINEERS

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
PYTHON PROGRAMMING for ENGINEERS	COE3167880	Fall Semester	3+0	3	6
Prerequisites Courses	PROGRAMLAMAYA GİRİŞ				
Recommended Elective Courses	Required background: Basic skills in object oriented programming				
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Elective				
Course Coordinator	Prof.Dr. Bahadır Kürşat GÜNTÜRK				
Name of Lecturer(s)	Prof.Dr. Selim AKYOKUŞ				
Assistant(s)					
Aim	The course presents programming principles and applications in Python. The topics covered include: Python programming language, use of external libraries, lists and dictionaries, recursion, sorting algorithms, dynamic programming, exception handling, input/output. The course presents applications from different fields of engineering and computer science: simulation, optimization, data analysis, data visualization, image processing, machine learning and more.				
Course Content	This course contains; Introduction to Python: Variables and Memory, Strings, Conditionals, Flow Control, Functions and External Libraries, Lists and Tuples, Dictionaries, Input/Output and Exceptions, Strings and String Manipulation, Searching and Sorting, Object Oriented Programming: classes, methods, inheritance, Simulation and Optimization, Numerical Computations and Methods, Data Analysis and Visualization, Image processing, Machine Learning, Advanced Applications with Python.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
Student can implement algorithms in Python programming language			1, 15, 16, 4, 9	A, C, D	
Student will acquire the object oriented programming skill in Python			1, 15, 16, 4, 9	A, C, D	
Student can use the code libraries that are available for different applications			1, 16, 4	C, D	
Student can code solutions in Python for basic problems of optimization, image processing and machine learning			1, 15, 16, 4, 9	A, C, D	
Student will acquire the ability to analyze and visualize data in Python			1, 15, 4, 9	A, C, D	
Teaching Methods	1: Lecture, 15: Problem solving, 16: Project Based Learning, 4: Exercise, Practice, 9: Simulation				
Assessment Methods	A: Written Exam, C: Homework, D: Project / Design				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Introduction to Python: Variables and Memory, Strings, Conditionals, Flow Control	Book Chapter 2			
2	Functions and External Libraries	Book Chapter 3			
3	Lists and Tuples	Book Chapter 10, 12			
4	Dictionaries	Book Chapter 11			
5	Input/Output and Exceptions	Book Chapter 14			
6	Strings and String Manipulation	Book Chapter 8			
7	Searching and Sorting				
8	Object Oriented Programming: classes, methods, inheritance	Book Chapter 15, 16, 17, 18			
9	Simulation and Optimization				
10	Numerical Computations and Methods				
11	Data Analysis and Visualization				
12	Image processing				
13	Machine Learning				
14	Advanced Applications with Python				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
<p>Course Textbook: Think Python, How to Think Like a Computer Scientist, Allen Downey http://www.cs.tau.ac.il/courses/pyProg/1213a/misc/thinkpython.pdf</p> <p>Supplementary Material: Dive Into Python, Mark Pilgrim http://www.cs.tau.ac.il/courses/pyProg/1213a/misc/diveintopython.pdf Learn Python the Hard Way, 3rd ed., Zed A. Shaw ISBN-13: 978-0321884916 Python web page: https://www.python.org</p>