



COURSE INFORMATION FORM

Course Name	Course Code
INTRODUCTION TO PROGRAMMING (PYTHON)	151412213

Semester	Number of Course Hours per Week		ECTS
	Theory	Practice	
2	3	0	4

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
2	2	0	0	0

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

<b>Prerequisite(s) if any</b>	-
<b>Objectives of the Course</b>	Introducing engineering students to programming concepts and equipping them with basic programming skills using the Python programming language. Enabling students to gain knowledge about algorithm development, problem-solving techniques, and software development processes.
<b>Short Course Content</b>	The course will begin with an introduction to the Python programming language, introducing variables and data types. Students will develop problem-solving skills using control structures such as conditional statements and loops. The topics of functions and modular programming will help students create more structured and reusable code. Various data processing techniques will be learned through data structures like lists, tuples, and dictionaries, and students will gain skills in reading and writing data through file operations. The course will cover debugging and exception handling. Additionally, fundamental concepts of object-oriented programming (OOP) such as classes, objects, and inheritance will be addressed. Finally, popular Python libraries for data analysis such as NumPy and pandas, as well as engineering-related libraries like SciPy and SymPy, will be introduced and reinforced with practical examples.

Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1 Gain the ability to understand and apply the basic syntax and structure of the Python programming language.	PO1	1, 6, 10	A, B, D
2 Develop problem-solving skills using fundamental programming concepts (variables, data types, control structures, functions).	PO1, PO2	1, 5, 6, 10	A, B, D
3 Acquire the ability to develop algorithms and design software.	PO2, PO3	1, 10, 14	D
4 Gain the ability to effectively use and manage various data structures (lists, tuples, dictionaries) using Python.	PO4	1, 6, 10	A, B, D
5 Learn and apply processes for reading and writing data through file operations.	PO4, PO5	1, 6, 10	A, D
6 Learn and apply object-oriented programming (OOP) principles, utilizing concepts like classes and objects in Python.	PO3, PO4	1, 6, 10	A, D
7 Develop skills in data analysis using Python, leveraging libraries such as NumPy and pandas.	PO4, PO5	1, 6, 10	A, D
8 Develop skills in debugging and managing exceptions encountered during programming processes.	PO4	1, 6, 10	A, B, D
9 Gain the ability to document and present developed software, ensuring effective communication.	PO7	1, 15	D

\*Teaching Methods 1:Expression, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Trouble/Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

\*\*Measuring Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

10	Develop a lifelong learning mindset, continuously updating oneself and keeping up with technological advancements.	PO8	1, 11	D
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<b>Main Textbook</b>	Course Notes
<b>Supporting References</b>	Python Öğreniyorum, Kodlab, 2018, Kodlab. Python ile Algoritma ve Programlama, 2023, Kodlab. Python ile Programlama, 2023, İkinci Adam Yayınları
<b>Necessary Course Material</b>	-

<b>Course Schedule</b>	
<b>1</b>	Introduction to Programming and Python (installation and first program)
<b>2</b>	Variables and Data Types (numeric and string data types and operations, type conversions)
<b>3</b>	Operators and Expressions (arithmetic expressions, comparison and logical operators, precedence of expressions)
<b>4</b>	Control Structures (if, elif, else, conditional expressions and boolean logic, nested conditional expressions)
<b>5</b>	Control Structures (while loop, for loop, break – continue – pass statements)
<b>6</b>	Lists, Tuples, Sets, and Dictionaries (creation, access, and properties)
<b>7</b>	Functions (definition, calling, parameters, and arguments)
<b>8</b>	Mid-Term Exam
<b>9</b>	Functions (local and global variables, lambda functions)
<b>10</b>	String Operations (methods, formatting, and regular expressions)
<b>11</b>	File Operations (opening, reading, and writing files, with statement, working with CSV files)
<b>12</b>	Error Management (try-except blocks, error types, raising exceptions, custom errors)
<b>13</b>	Introduction to Object-Oriented Programming (OOP) (class and object concepts, methods and attributes, inheritance and polymorphism)
<b>14</b>	Libraries (NumPy, pandas, matplotlib)
<b>15</b>	Libraries (SciPy, SymPy)
<b>16,17</b>	Final Exam

<b>Calculation of Course Workload</b>			
<b>Activities</b>	<b>Number</b>	<b>Time (Hour)</b>	<b>Total Workload (Hour)</b>
Course Time (number of course hours per week)	14	3	42
Classroom Studying Time (review, reinforcing, prestudy,...)	7	1	7
Homework	6	2	12
Quiz Exam	3	1	3
Studying for Quiz Exam	3	5	15
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	1	1
Studying for Mid-Term Exam	1	7	7
Final Exam	1	1	1
Studying for Final Exam	1	7	7
<b>Total workload</b>			<b>95</b>
<b>Total workload / 30</b>			<b>3.17</b>
<b>Course ECTS Credit</b>			<b>3</b>

Evaluation	
<b>Activity Type</b>	<b>%</b>
Mid-term	30
Quiz	20
<b>Final Exam</b>	<b>50</b>
<b>Total</b>	<b>100</b>

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOME	Contribution
1	PO-1: Sufficient knowledge in mathematics, science, and fundamental engineering; ability to apply theoretical and practical knowledge in these fields to model and solve Engineering problems.	5
2	PO-2: Skills to identify, define, formulate complex engineering problems in civil engineering and related fields, and to select and apply appropriate analysis and modeling methods to solve them.	3
3	PO-3: Ability to design a complex system, device, or product under realistic constraints and conditions, applying modern design methods towards a specified goal.	3
4	PO-4: Ability to develop, select, and use modern techniques and tools necessary for Civil Engineering applications, and to effectively utilize information technologies.	5
5	PO-5: Ability to design experiments, conduct experiments, collect data, analyze and interpret results for the investigation of Civil Engineering problems.	4
6	PO-6: Ability to work effectively in intra-disciplinary and inter-disciplinary teams.	3
7	PO-7: Effective communication skills in Turkish, both oral and written, and ability to use/improve knowledge of a foreign language.	2
8	PO-8: Recognition of the need for lifelong learning; ability to access information, follow developments in science and technology, and continuously renew oneself.	5
9	PO-9: Consciousness of professional and ethical responsibility.	2
10	PO-10: Knowledge about business life practices such as project management, risk management, and change management; awareness about entrepreneurship, innovation, and sustainable development.	2
11	PO-11: Knowledge about the effects of engineering practices on health, environment, and safety in universal and societal dimensions; awareness about national and international legal regulations and standards, and the legal consequences of engineering solutions.	1

LECTUTER(S)				
<b>Prepared by</b>	Res. Asst. Dr. Ömer KARAGÖZ			
<b>Signature(s)</b>				

**Date:**19.07.2024