Anan College	Year	2024	Course Title	Computer Programming Exercises

Course Information

Course Code	1213G02	Course Category	Specialized / Compulsory
Class Format		Credits	School Credit: 2
Department	Course of Mechanical Engineering	Student Grade	3rd
Term	Year-round	Classes per Week	前期:2 後期:2
Textbook and/or Teaching Materials	Ichiban yasashii Python nyuumon kyoshitsu (Sotec)		
Instructor	Matsuura Fuminori		

Course Objectives

V-A-7 Mechanical Engineering::Information Processing
[a] Operation
a1) Students understand how to execute a code and can run it.

[b] Constants and Variables
b1) Students can explain what are Constants and Variables.
b2) Students can explain what are Integers, Floating Points and Character types.

[c] Operators
c1) Students can understand and implement what are the Operators and their priorities.
c2) Students can implement using arithmetic and compare operators.

[d] I/O
d1) Students can implement a software using I/O.

[e] Control
e1) Students can implement a software including a conditional branch.
e2) Students can implement a software including a loop.

[f] Arrays
f1) Students can implement a software using one-dimensional array.

Rubric

	Ideal Level	Standard Level	Minimum Level
Achievement 1	More than or equal to 80 % in achievement on [a], [b], [c] and [d]	More than or equal to 65 % and less than 80 % in achievement on [a], [b], [c] and [d]	More than or equal to 60 % and less than 65 % in achievement on [a], [b], [c] and [d]
Achievement 2	More than 80 % in achievement on [e] and [f]	More than or equal to 65 % and less than 80 % in achievement on [e] and [f]	More than or equal to 60 % and less than 65 % in achievement on [e] and [f]

Assigned Department Objectives

学習・教育到達度目標 B-4 学習・教育到達度目標 D-1

Teaching Method

Outline	Learn the syntax of the programming language Python, which is suitable for scientific and technological calculations, and hone the skills to create basic programs.
Style	Sixty hours of lecture
Notice	The "Learning Objectives" in the following "Course Plan" are listed only by items to avoid complicated descriptions. The actual learning objective is "to be able to explain or implement the content written in the respective section."

Characteristics of Class / Division in Learning

☐ Active Learning	☑ Aided by ICT	☐ Applicable to Remote Class	☐ Instructor Professionally Experienced

Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	What is a program?	Lesson1-1 A collection of instructions. Lesson1-2 How do you create a program? Lesson1-3 What do you need to create a program? Lesson1-4 What should you study?
		2nd	Let's begin Python	Lesson2-1 Using Python Lesson2-2 Installing Python Lesson2-3 Let's execute some simple commands Lesson2-4 Playing with interactive mode
		3rd	Rule for programing in Python	Lesson3-1 Let's compile instructions into a single file Lesson3-2 Let's line up many instructions Lesson3-3 How to open a saved file Lesson3-4 Let's display some text Lesson3-5 Let's concatenate strings
		4th	Rule for programing in Python	Lesson3-6 Rules for properly displaying Japanese characters Lesson3-7 Let's display a long string Lesson3-8 The roles of spaces, indentation, and line breaks Lesson3-9 How to write comments to supplement your program

		5th	Fundamental functions of a program	Lesson4-1 The six major elements that make up a program Lesson4-2 Let's try using variables
		6th	Fundamental functions of a program	Lesson4-3 Let's try executing repetitively 1: for loop
		7th	Fundamental functions of a program	Lesson4-4 Let's try executing repetitively 2: while loop
		8th	Midterm exam	
	2nd Quarter	9th	Fundamental functions of a program	Lesson4-5 Conditional branching: if statement
		10th	Fundamental functions of a program	Prime number operations
		11th	Fundamental functions of a program	Prime number operations
		12th	Fundamental functions of a program	Prime number operations
		13th	Fundamental functions of a program	Lesson4-6 Using functions Lesson4-7 Extending functionality with modules
		14th	Fundamental functions of a program	Collatz conjecture
		15th	Fundamental functions of a program	Collatz conjecture
		16th	Final exam	
2nd Semester	3rd Quarter	1st	Data Structures and Algorithms	List structure
		2nd	Data Structures and Algorithms	Other data structures
		3rd	Data Structures and Algorithms	Examples using data structures
		4th	GUI	Displaying a window with Tkinter
		5th	GUI	Simple calculator
		6th	GUI	Calculator with state transitions
		7th	GUI	Calculator with state transitions
		8th	Midterm exam	
	4th Quarter	9th	Numerical calculation and graphing	Fitting using the least squares method
		10th	Numerical calculation and graphing	Creating graphs with Matplotlib
		11th	Numerical calculation and graphing	Application examples to experimental data
		12th	Challenge image recognition	Lesson8-1 Challenging AI Lesson8-2 Modules that add functionality to Python
		13th	Challenge image recognition	Lesson8-3 Let's try using the object detection library "YOLOv8" Lesson8-4 Let's display an image in a window
		14th	Challenge image recognition	Lesson8-5 Let's detect objects with Python
		15th	Challenge image recognition	Lesson8-6 Let's train images
		16th	Final exam	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	0	0	0	0	0	0	0
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0