Tsuyama College	Year	2021	Course Title	Fundamentals of Integrated Science and Technology

Course Information

Course Code	0002	Course Category	Specialized / Compulsory
Class Format	Lecture	Credits	School Credit: 2
Department	Department of Integrated Science and Technology Electrical and Electronic Systems Program	Student Grade	1st
Term	Year-round	Classes per Week	2
Textbook and/or Teaching Materials	Textbook: "Electrical and Electronic Circuit Basics" (Denki Shoin) Electric Circuit "Electrical Basics" (Tokyo Electric University Press) Prints will be distributed as appropriate. Programming printed teaching materials Reference book: Electric circuit "Practice electrical basics" (Tokyo Electric University Press)		
Instructor	NISHIO Kimihiro,MATSUSHIMA Yukiko,FANG Guanshen		

Course Objectives

Learning purposes: The purpose of the study is to understand the contents of DC circuits, which are considered to be the most basic of electrical and electronic engineering, so that future specialized subjects can be easily understood by understanding the basics of electricity. In addition, you will understand the basics of computers and programming, and learn and use how to express algorithms.
Couese Objectives:
Electric circuit
1. Explain how to analyze DC circuits.
2. Quantitative calculation of DC circuit is possible.
Programming
1. Algorithms can be described using PAD (Problem Analysis Diagram) or flowcharts.
2. Understand the basics of C language programming and be able to create programs based on algorithms.

Rubric

	Excellent	Good	Acceptable	No acceptable
Electric circuit Achievement 1	Understand the analysis method of DC circuits and be able to explain accurately.	Understand and explain how to analyze DC circuits.	The method of analyzing a DC circuit can be roughly explained.	Can't explain without understanding how to analyze DC circuits.
Electric curcuit Achievement 2	Understand the quantitative calculation of DC circuits and be able to explain them accurately.	Understand and explain the quantitative calculations of DC circuits.	Can roughly explain the quantitative calculation of DC circuits.	Can't explain without understanding the quantitative calculation of DC circuits.
Programing Achievement 2	You can create a PAD of the basic algorithm without referring to anything.	You can understand the PAD of the basic algorithm and create a PAD by modifying it.	Understand the basic algorithm PAD.	I can't understand the basic algorithm PAD.
Programing Achievement 2	Understand variables, assignments, iteration structures, and branch structures, and be able to create correct programs.	Understand variables, assignments, iteration structures, and branch structures, and be able to create correct programs while referring to PAD.	I understand variables, assignments, iteration structures, and branching structures, but I can't create the correct program by referring to PAD.	I can't create a correct program by referring to PAD without understanding variables, assignments, iteration structures, and branch structures.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized :Specialized Field of learning : Electrical / electronic, information / control Required, Elective, etc. : Required subjects Foundational academic disciplines : Electrical and electronic engineering, informatics / software Relationship with Educational Objectives :This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area". Relationship with JABEE programs :A, A-2 The main goals of learning / education in this class are "(A), A-2". Course outline : Learn the basics of electrical circuits and programming required in the fields of electronics, information, and communication. In electrical circuits, students will learn about DC circuits, which are considered to be the most basic of electrical and electronic engineering, so that first graders can become familiar with electrical and electronic engineering. In programming, you will learn the calculation procedure (algorithm) given to a computer and the basics of programming in C language based on this.
Style	Course method : For electric circuits, the lessons will be centered on board writing. In order to deepen the understanding, we will proceed with the lessons while solving the exercises as appropriate. In addition, reports and issues will be given according to the situation. Programming is a combination of lectures on algorithms written on the board and exercises in C language programming. Grade evaluation method : Evaluation of electrical circuits (50%) (Equally evaluate the results of two regular exams (25%), evaluate exercises and reports (25%). Do not allow textbooks / notes to be brought into the exam. .) Programming evaluation (50%) (Comprehension evaluation (average of two regular exams) (40%), Exercise evaluation (10%)) If the result of the regular test is less than 60 points, the score may be changed if the understanding can be confirmed by the retest. However, the overall evaluation shall not exceed 60 points.

Notice	Precautions on the enrollment : It is mandatory to take this course to complete the course of the academic year. Please note the number of missed classes as this course will be held for two consecutive hours in half a year. Course advice : For electric circuits, it is important not only to understand the knowledge of DC circuits but also to develop the ability to perform circuit analysis through exercises, so it is also necessary for the students to voluntarily tackle the tasks. There is no particular specialized knowledge required in advance for programming. However, since many new concepts and terms will appear, I would like you to prepare and review to deepen your understanding. Foundational subjects : Related subjects : Mathematics and science learned in junior high school Related subjects: General specialized subjects Attendance advice : In electric circuits, it is recommended to take notes while understanding what is written on the board. Look back at the notebook on that day to clarify the points of lack of understanding, and try to ask questions in the next lesson. If it is within 25 minutes of the start of class, it will be late. In programming, typing speed and accuracy are important, so practice well. In addition, entry after confirmation of attendance will be delayed. If you are late, you will be treated as absent from one credit hour for two times.

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	Guidance, memory and vriables	Understand the following contents respectively. Memory and variable basics
		2nd	Substitution, basics of PAD diagram	Substitution of numbers into variables and basics of PAD diagrams
		3rd	Basics of C language	Basics of programming in C language
		4th	Explanation of development environment, programming exercise [printf]	Program development environment and exercises
		5th	Iterative structure by PAD, programming exercise [while]	Description and programming of iterative structure by PAD [while]
		6th	Programming Exercise [while]	Iterative structure programming [while]
		7th	Programming exercise [for]	Iterative structure programming [for]
		8th	1st semester mid-term exam	
	2nd Quarter	9th	Return and commentary of exam answers	
		10th	Basics of one-dimensional array, programming exercise [one-dimensional array]	Basics of one-dimensional array
		11th	Branch structure by PAD, programming exercise [if, scanf]	Branch structure by PAD [if, scanf]
		12th	Condition description (&, |,!), Exercise [Condition description]	Basics of condition description (&, |,!)
		13th	Programming exercise [condition description]	Complex condition description (&, |,!)
		14th	Combination of iterative structure and branch structure by PAD, programming exercise [Comprehensive]	Combination of iterative structure and branched structure by PAD
		15th	1st semester final exam	
		16th	Return and commentary of exam answers	
2nd Semester	3rd Quarter	1st	Guidance	Understand the following contents respectively.
		2nd	Voltage / current of electric circuit	Voltage / current of electric circuit
		3rd	Ohm's law	Ohm's law
		4th	Series connection of resistors	Series connection of resistors
		5th	Parallel connection of resistors	Parallel connection of resistors
		6th	Shunt circuit	Shunt circuit
		7th	Voltage divider circuit	Voltage divider circuit
		8th	2nd semester mid-term exam	
	4th Quarter	9th	Return and commentary of exam answers. Kirchhoff's Law	Kirchhoff's Law
		10th	Kirchhoff's Law(1)	Kirchhoff's Law(1)
		11th	Kirchhoff's Law(2)	Kirchhoff's Law(2)
		12th	Kirchhoff's Law(3)	Kirchhoff's Law(3)
		13th	Wheatstone bridge, battery connection method	Wheatstone bridge, battery connection method
		14th	Power consumption	Power consumption
		15th	2nd semester final exam	
		16th	Return and commentary of exam answers	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	65	0	0	0	35	0	100

Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	65	0	0	0	35	0	100
Cross Area Proficiency	0	0	0	0	0	0	0