

Tsuyama College		Year	2021		Course Title	Digital Engineering
Course Information						
Course Code	0049		Course Category	Specialized / Compulsory		
Class Format	Lecture		Credits	School Credit: 1		
Department	Department of Integrated Science and Technology Advanced Science Program		Student Grade	3rd		
Term	Second Semester		Classes per Week	2		
Textbook and/or Teaching Materials	Textbooks : "Konpyuta no Shikumi wo Rikai surutame no 10 Shou" (Gijyutu Hyouron Shya)					
Instructor	MAEHARA Kenji,MINATOHARA Tetsuya,YAMAMOTO Tsunayuki,KAWAI Masahiro,NAKAMURA Naoto					
Course Objectives						
Learning purposes : To understand the structure of the digital expression of information and the structure of the digital computer.						
Course Objectives : 1. To understand structure of the digitization of digital data. 2. To understand structure of the digitization of various data including an image and letter. 3. To understand structure of the operation of the computer and the relationship with the logical circuit. 4. To understand structure of the program movement, and can program it by the Assembler program.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	The student can completely interconvert between a binary and a decimal number, between a decimal number and the hex digit.	The student can interconvert between a binary and a decimal number, between a decimal number and the hex digit.	The student can interconvert between a binary and a decimal number, between a decimal number and the hex digit while looking at the conversion list.	The student can't interconvert between a binary and a decimal number, between a decimal number and the hex digit.		
Achievement 2	The student can completely interconvert between an image or a letter and digital data, based on a given rule.	The student can interconvert between an image or a letter and digital data, based on a given rule.	The student can interconvert between an image or a letter and digital data, based on a given rule, while looking at an example.	The student can't interconvert between an image or a letter and digital data, based on a given rule.		
Achievement 3	The student understands well the association of mechanism of the computer operation and the logical circuit and can explain it using the truth table of logical circuit.	The student can explain the association of mechanism of the computer operation and the logical circuit using the truth table of logical circuit.	The student can generally explain the association of mechanism of the computer operation and the logical circuit.	The student can't explain the association of mechanism of the computer operation and the logical circuit.		
Achievement 4	The student can explain the computer operation and the program execution of every step, and make an assembler program.	The student can generally explain the computer operation and the program execution, and make an assembler program.	The student can generally explain the computer operation and the program execution, and make an assembler program, while looking at an example.	The student can't explain the computer operation and the program execution, and make an assembler program.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Information and Control Foundational academic disciplines : Information science/Calculation base/Computer system Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area". Relationship with JABEE programs : The main goal of learning / education in this class is "(A)". Course outline : In the daily life and industrial activities of the modern society, there are many opportunities to come into contact with and handle digitized information. In this subject, the student learns the basics of digitizing information and the structure of the computer for processing digital information.					
Style	Course method : Classes are conducted using the blackboard, and mainly lectures on digitization, logical circuits, and programming held, while being careful about the association with the digital technology and experience in everyday life. In addition, exercises and reports are assigned so that deepen understanding. Grade evaluation method : Regular exams (70%) + Practice (30%). Examinations will be conducted a total of 2 times, and the evaluation ratios will be the same. Students with poor results may be retested. The limit of the score after retest is 60 points.					

Notice	<p>Precautions on the enrollment : Students must take this class (no more than one-third of the required number of class hours may be missed) in order to complete the 3rd year course.</p> <p>Course advice : Review the topical parts of information literacy regularly. Review the content that you learned in previous classes and practice well. Submit a report problem by all means.</p> <p>Foundational subjects : Information Literacy (1st year) Related subjects : Design of Electronic and Information Circuits(5th year)</p> <p>Attendance advice : If you are late for the start time, you will be treated as absent after 20 minutes. Preparing for next lesson by reading a textbook beforehand, and answer homework by own power. And understanding a class of every time steadily, asking about an ignorance point.</p>
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Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input checked="" type="checkbox"/> Applicable to Remote Class	<input checked="" type="checkbox"/> Instructor Professionally Experienced
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Must complete subjects

Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance, gives an outline.	Understand about the following contents each.
		2nd	Characteristic of digital data, learning and practice of the relations of binary, a decimal number, the hexadecimal.	Analog and digital, interconversion of binary, a decimal number, the hexadecimal.
		3rd	Negative number and complementary number, learning and practice of the expression of digital data.	Complementary number, the negative number express.
		4th	Character code, learning and practice of the structure of the digitization of the analog data.	Character code, sampling and quantization.
		5th	Learning and practice of the digitization of an image and the sound.	Digitization of an image and the sound.
		6th	Learning of the conversion circuit of the digital data and analog signal.	D/A conversion, A/D conversion.
		7th	A summary and review.	Digital data, image, structure of the digitization of various data including the letter.
		8th	2nd semester mid-term exam.	
	4th Quarter	9th	Return and commentary of exam answers. Explanation of the structure of the operation of the computer.	CPU, structure of the operation of the computer.
		10th	Binary logic, truth list, Boolean expression, learning and practice of the logical circuit.	Binary logic, truth list, Boolean expression, logical circuit.
		11th	Learning and the practice that I simplify it, and the structure of a logical circuit and the computer is it-related of the Boolean expression.	Boolean expression simplify, the addition circuit or a decoder, etc.
		12th	Sequential circuit, learning of the structure of the program practice in the computer.	Memory circuit and register, instruction cycle.
		13th	The instruction of the computer and learning of the assembly language.	Instruction form, assembly language.
		14th	Practice of the programing by the assembly language.	Programing by the assembly language.
		15th	(2nd semester final exam)	
		16th	Return and commentary of exam answers	

Evaluation Method and Weight (%)

	Examination	Practice	Total
Subtotal	70	30	100
Basic Proficiency	0	0	0
Specialized Proficiency	70	30	100
Cross Area Proficiency	0	0	0