

Akashi College		Year	2022	Course Title	Experiments of Computer Engineering I
Course Information					
Course Code	4422		Course Category	Specialized / Compulsory	
Class Format	Experiment		Credits	School Credit: 4	
Department	Electrical and Computer Engineering Computer Engineering Course		Student Grade	4th	
Term	Year-round		Classes per Week	4	
Textbook and/or Teaching Materials					
Instructor	NAKAI Yuichi,TERASAWA Shinichi,INOUE Kazunari,HIRANO Masatsugu,NOMURA Hayato,ENOMOTO Ryuji				
Course Objectives					
1. Can actively participate in experiments by group and carry out experiments in cooperation with the group members. 2. Can conduct experiments in a planned manner based on the basic ability, and analyze the results of an experiment. 3. Can summarize the results of a experiments in a report with correct writing expressions.					
Rubric					
	Ideal Level		Standard Level		Unacceptable Level
Achievement 1	Can actively participate in experiments by group and carry out experiments in cooperation with the group members.		Can carry out experiments in cooperation with the group members.		Cannot carry out experiments.
Achievement 2	Can conduct experiments in a planned manner and analyze the results of an experiment.		Can analyze the results of the experiments.		Cannot analyze the results of an experiment.
Achievement 3	Can summarize the results of an experiment in a report with correct writing expressions and submit in time.		Can summarize the results of an experiment in a report with correct writing expressions.		Cannot summarize the results of an experiment in a report.
Assigned Department Objectives					
Teaching Method					
Outline	The goal of this course is to acquire the ability to solve new problems practically while understanding and confirming the knowledge and techniques of electrical information acquired so far through experimental themes. Furthermore, the course requires students to submit reports on each theme, in order to help them learn necessary writing expressions for scientific reports. The experiments will be conducted by groups, to help students develop autonomy, coordination, planning, and leadership. Inoue and Nakai will be in charge of information-related activities, Hirano will be in charge of measurement-related activities, Nomura and Terazawa will be in charge of FPGA-related activities, Terazawa will be in charge of microcomputer-related activities. In the network experiment, faculty members with practical experience in router and other network equipment development will utilize their experience in experiments on the configuration of the equipment and the construction of a LAN. The experiments in weeks 9 to 12 of the first semester and week 9 of the second semester will be supervised by persons engaged in the development of electronic devices and other activities in a company.				
Style	Students will conduct experiments on themes closely related to the electrical and electronic fields, such as information technology, FPGAs, and microcomputers, in groups of four to five, and submit a report on them. They will actively conduct experiments give, based on their own necessary preparation and pre-study, and guidance provided on the spot by the instructor of the experiment. In the information engineering experiment, faculty members with practical experience in router and other network equipment development will utilize their experience in experiments on the configuration of the equipment and the construction of a LAN.				
Notice	If all reports have not been received by the due date, students will not receive a passing grade. Students must clean the lab and put away the equipment. Precautions regarding the experiments will be given during the first week of the first and second semesters. Students have to participate in all experiments. Students will not be graded unless they have participated in all experiments.				
Characteristics of Class / Division in Learning					
<input checked="" type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class	
<input checked="" type="checkbox"/> Instructor Professionally Experienced					
Course Plan					
			Theme	Goals	
1st Semester	1st Quarter	1st	Experiment guidance	Understand the various precautions related to engineering experiments and the outline of the theme of each experiment.	
		2nd	Making LAN cables	Understand how LAN cables work and TCP/IP Layer 2, including forwarding.	
		3rd	Network fundamentals and IP addresses	Understand layer 2 and 3 by the operation of L2 and L3 switches.	
		4th	Various router configurations and the internet	Understand the various router configurations, WAN/LAN isolation, and security controls.	
		5th	Internet of things experiments using Microcomputer 1	Understand the control of communication devices using microcomputers.	
		6th	Internet of things experiments using Microcomputer 2	Understand the IoT in LPWA communications and data transfer to servers.	
		7th	Report organization	Can examine and compile the results of the experiment into a report.	
		8th	No midterm exam		
	2nd Quarter	9th	FPGA1 (Circuit design)	Understand logic circuit inputs using IDE (Integrated Development Environment).	

		10th	FPGA2 (emulator debug)	Understand the simulation and debugging of logical circuits using the IDE (Integrated Development Environment).
		11th	FPGA3 (implementation and operation)	Understand circuit implementation in FPGA(Field Programmable Logic Array).
		12th	FPGA4 (evaluation)	Understand the operation, debugging, and evaluation of implementation circuitry with FPGAs.
		13th	Computer measurement I.	Can perform waveform measurement and processing using a computer and measurement interface.
		14th	Computer measurement II.	Can fabricate a stethoscope using a computer and an interface microphone for measurement.
		15th	Report organization	Can examine and compile the results of the experiment into a report.
		16th	No final exam	
2nd Semester	3rd Quarter	1st	Experiment guidance	Understand the Precautions regarding engineering experiments and the outline of each experiment theme.
		2nd	Drone control with Python (1)	Understand the basics of controlling drones using Python.
		3rd	Drone control with Python (2)	Can use Python to provide simple drone control.
		4th	Drone control with Python (3)	Can create a Python program to perform a given task.
		5th	Drone control with Python (4)	Can create a Python program to perform a given task.
		6th	Drone control with Python (5)	Can create a Python program to perform a given task.
		7th	Drone control with Python (6)	Can perform the task in the completed program.
		8th	No midterm exam	
	4th Quarter	9th	Microcomputer 1	Can build control systems using embedded microcomputers.
		10th	Microcomputer 2	Can build control systems using embedded microcomputers.
		11th	Microcomputer 3	Can build control systems using embedded microcomputers.
		12th	Report organization	Can examine and compile the results of the experiment into a report.
		13th	AI 1	Can build AI system.
		14th	AI 2	Can build AI system.
		15th	Summarizing and organizing	Can summarize and organize the experiment.
16th		No final exam		

Evaluation Method and Weight (%)

	Report	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	80	0	0	20	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	80	0	0	20	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0