Akashi College	Year	2022	Course Title	Experiments of Mechanical Engineering Ⅱ A

Course Information

Course Code	4422	Course Category	Specialized / Compulsory
Class Format	Experiment	Credits	School Credit: 1
Department	Mechanical Engineering	Student Grade	4th
Term	First Semester	Classes per Week	2
Textbook and/or Teaching Materials			
Instructor	KATOH Takahiro,KUNIMINE Kanji,SEKIMORI Daisuke,SHI Fenghui,TANAKA Seiichi		

Course Objectives

1) Understand the principles and procedures of each experiment, and can carry out experiments accurately and safely, and process and aggregate experimental data.
2) Can logically examine the validity of experimental data, and compile them into a report.
(3) Can work together as a group and actively contribute to fulfill their responsibilities.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Can explain fully on the principles and procedures of each experiment, and can carry out experiments accurately and safely, and process and aggregate data.	Understand the principles and procedures of each experiment, and can carry out experiments and process and aggregate data.	Do not understand the principles and procedures of each experiment. Also, cannot carry out experiments and to process or aggregate data.
Achievement 2	Can logically examine and analyze the validity of experimental data, and can compile them into an easy-to-understandable report.	Can logically examine the validity of experimental data and compile them into reports.	Cannot logically examine the validity of experimental data. Also, cannot compile them into a report.
Achievement 3	Can work together as a group and actively contribute to fulfill their responsibilities, and lead the group by encouraging others to cooperate appropriately.	Can work together as a group and actively contribute to fulfill their responsibilities.	Cannot work together as a group and actively contribute. Also, cannot fulfill their responsibilities for the roles assigned to them.

Assigned Department Objectives

Teaching Method

Outline	Students will learn basic academic knowledge in the main fields of mechanical engineering at Department of Mechanical Engineering empirically through experiments. In addition, they will learn the methods and sensibility of engineering analysis through the organization and analysis of experimental results. Also, we will develop teamwork spirit and leadership through the group work.
Style	Students will split into six small groups and carry out experiments on six different themes in turn. The Course Plan shows their typical examples.
Notice	As it's an experiment subject learned empirically, it's prerequisite that students attend classes. Also, students must submit a report by the due date, as an assignment can only complete when a report is submitted. Students who miss 1/3 or more of classes will not be eligible for a passing grade.

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	Couse guidance (Tanaka) Safety education	Understand the need for safe working and examples of injury from hazardous behavior.
		2nd	Guidance (Tanaka) Guides on how to write a report and outline of experiment themes.	Understand specific methods such as the style of scientific and technological documents including description of graphs, diagrams, tables and formulas, composition of text, analysis and consideration of data, and can create experimental reports.
		3rd	Guidance (Katoh) Measurement technology in experiments	Understand and can explain the definition and type of measurement, the units, how to measure a typical physical quantity and the measuring equipment.
		4th	Guidance (Katoh) Measurement technology in experiments	Understand and can explain the definition and type of measurement, the units, how to measure a typical physical quantity and the measuring equipment. Understand the contents of the guidance and can prepare to conduct the experiment.
		5th	Thermal engineering experiment (1) (Kunimine) Comprehensive performance test of internal combustion engine	Can logically examine the validity of experimental data and compile them into reports.
		6th	Thermal engineering experiment (1) (Kunimine) Comprehensive performance test of internal combustion engine	Understand the principles and procedures of experiments, and can process and aggregate experimental data. Can work together as a group and actively contribute to fulfill their responsibilities.

		7th	Factory tour	A tour of the actual production site will allow better understanding of production.
		8th	Report writing Examine and compile the results of the experiment into a report.	Understand and consider corrections and additional instructions and can compile them into a more effective and easy-to-understand report.
	2nd Quarter	9th	Fluid engineering experiment (1) (Tanaka) Performance test of the swirl pump	Understand the principles and procedures of experiments, and can process and aggregate experimental data. Can work together as a group and actively contribute to fulfill their responsibilities.
		10th	Fluid engineering experiment (1) (Tanaka) Performance test of the swirl pump	Can logically examine the validity of experimental data and compile them into reports.
		11th	Design Engineering Experiment (1) (Shi) Dynamic System Simulation with MATLAB / Simulink	Understand the principles and procedures of experiments, and can process and aggregate experimental data. Can work together as a group and actively contribute to fulfill their responsibilities.
		12th	Design Engineering Experiment (1) (Shi) Dynamic System Simulation with MATLAB / Simulink	Can logically examine the validity of experimental data and compile them into reports.
		13th	Measurement and Control Engineering Experiment (1) (Sekimori) The dynamic characteristics of an R-C series circuit	Understand the principles and procedures of experiments, and can process and aggregate experimental data. Can work together as a group and actively contribute to fulfill their responsibilities.
		14th	Measurement and Control Engineering Experiment (1) (Sekimori) The dynamic characteristics of an R-C series circuit	Can logically examine the validity of experimental data and compile them into reports.
		15th	Factory tour	A tour of the actual production site will allow better understanding of production.
		16th	No final exam	

Evaluation Method and Weight (%)

	Efforts・Behavior	Analysis・Consideration	Report	Total
Subtotal	20	40	40	100
Basic Proficiency	0	0	0	0
Specialized Proficiency	10	40	40	90
Cross Area Proficiency	10	0	0	10