Tsuyama College	Year	2021	Course Title	Experiments in Physics

Course Information

Course Code	0098	Course Category	Specialized / Compulsory
Class Format	Experiment	Credits	School Credit: 1
Department	Department of Integrated Science and Technology Advanced Science Program	Student Grade	4th
Term	Second Semester	Classes per Week	2
Textbook and/or Teaching Materials	Textbook : "Physics experiment" (Print, distributed at the time of guidance)		
Instructor	SASAI Yuji		

Course Objectives

Learning purposes :
Acquire techniques for various measurements related to physics, and understand what student have learned about specialized subjects through experiments.

Course Objectives :
1. Understand the handling of laboratory equipment and acquire the ability to solve problems safely, correctly, independently and with emphasis.
2. By compiling the experimental results in a report, acquire the ability to express in graphs, sentences, formulas, etc.
3. Can be physically considered and explained from the experimental results.
4. Be able to act in collaboration with others to achieve their goals.

Rubric

	Ideal Level	Standard Level	Unacceptable Level
Achievement 1	Can understand very well how to achieve the purpose by using experimental equipment, instruments, information equipment, etc.	Can understand the method of achieving the purpose by using experimental equipment, instruments, information equipment, etc.	Has not reached the left.
Achievement 2	Can be properly summarized the experimental results in a report.	Can be summarized the experimental results in a report.	Has not reached the left.
Achievement 3	Can physically consider and explain appropriately from the experimental results.	Can physically consider and explain from the experimental results.	Has not reached the left.
Achievement 4	Can actively cooperate and collaborate with others to achieve goals.	Can cooperate and collaborate with others to achieve goals.	Has not reached the left.

Assigned Department Objectives

Teaching Method

Outline	General or Specialized : Specialized Field of learning : Experiment and Practice Required, Elective, etc. : Required subjects Basic disciplines: Mathematical science / physics / general physics Relationship with Educational Objectives : This course is a course to further promote "(3) Specialized knowledge" and "(6) Ability to take action". Relationship with JABEE programs : The main goal of learning or education in this subject is "(A) Deepening of basic knowledge about technology, A-2 : Can acquire and explain knowledge in specialized technical fields". Class outline : Deepen the understanding of physics knowledge learned so far through experiments. Learn measurement technology, handling experimental data, organizing measurement results, and creating reports.
Style	Course method: Divide into groups of 4 to 5 students and perform experiments on 11 themes. Organize the experimental results, examine and consider them, make a experimantal report, and submit it to the teacher in class. Grade evaluation method: Experiment report (80%) + Attendance status and class attitude (20%). Regarding the experiment report, if there is no problem, it will be about 85 points, and points will be deducted depending on the content and submission status. Of course, there are points to be added to excellent experimental reports.

Notice	Precautions on the enrollment : Since this course is mainly for practical skills, student must takethis class (the number of absent hours is less than one-third of the prescribed number of class hours) and acquire credit in order to complete the course of the academic year. Course advice : Bring a calculator and a lab notebook. Student may also bring your own PC for data organization and report creation. Basic subjects : Physics I (1st year), Physics II (2), Experiments in Science (2), Dynamics I・II・III (3) General Physics (3), Mathematics up to the third year Related subjects : Rigid Body Dynamics (3), Analytical Dynamics (4), Electromagnetism (4), Modern Physics (4), Quantum Science (5), Optoelections (5) Attendance advice : Read the experiment text carefully in advance, work on the tasks in advance, and fully understand the contents and how to proceed. Confirm lateness at the class start time. Late arrivals of 15 minutes or more in each time period will be treated as absent. Be sure to submit the experiment report by the deadline.

Characteristics of Class / Division in Learning

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

Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance	How to proceed with the experiment, how to organize it, understanding of cautions, grouping, text distribution.
		2nd	Shear modulus (The following experimental order differs depending on the group)	Experiment
		3rd	Computer simulation (select one theme from collision of two balls, lunar rocket, wave motion, electric field and electric potential)	Experiment
		4th	Speed of light	Experiment
		5th	Diffraction grating	Experiment
		6th	Specific charge of electrons	Experiment
		7th	Franck-Hertz experiment	Experiment
		8th	(2nd term midterm exam period) Preliminary experiment day	Re-experiment, report guidance
	4th Quarter	9th	Planck's constant	Experiment
		10th	Radiation measurement	Experiment
		11th	Cloud chamber experiment	Experiment
		12th	Raspberry Pi measurement experiment 1 (programming on Linux OS, LED lighting and blinking)	Experiment
		13th	Raspberry Pi measurement experiment 2 (temperature measurement)	Experiment
		14th	Preliminary experiment day	Re-experiment, report guidance
		15th	(2nd term final exam period) Preliminary experiment day	Re-experiment, report guidance
		16th	Final Guidance	

Evaluation Method and Weight (%)

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