

Akashi College		Year	2023		Course Title	Science II A-2
Course Information						
Course Code		5210		Course Category	General / Compulsory	
Class Format		Lecture		Credits	School Credit: 1	
Department		Mechanical Engineering		Student Grade	2nd	
Term		Second Semester		Classes per Week	2	
Textbook and/or Teaching Materials						
Instructor		TAKEUCHI Masahiro				
Course Objectives						
Rubric						
		Ideal Level		Standard Level		Unacceptable Level
Achievement 1		Understand the concept of significant figures and units, and handle them appropriately.		Can handle significant figures and units appropriately.		Doesn't understand the concept of significant figures and units, and can't handle them appropriately.
Achievement 2		Understand the concept of vector and component, and use them properly.		Can use vector and component properly.		Doesn't understand and can't use vector and component.
Achievement 3		Understand the concept of the dynamics of the physical quantity, and be able to explain those concepts and perform basic calculations.		Understand the concept of the dynamics of the physical quantity.		Doesn't understand the concept of the dynamics of the physical quantity.
Assigned Department Objectives						
Teaching Method						
Outline		Learn physics dynamics which is the basis of engineering. The study of dynamics is divided into four topics. In the first year, the students will learn until constant velocity circular motion (middle of dynamics topic 4). The students are required to acquire a tremendous amount of knowledge out a difficult topic, to be perseverant and don't give up. Dynamics 1: To understand the vector concept. The contents used here are speed and acceleration, topics learned at junior high school. To explain the components of a vector is necessary to understand the trigonometric functions. Also, will be guided to handle significant figures and units. The students will learn how to study by themselves through daily tasks, such as self-learning, doing assignments (task preparation research notes), etc. Dynamics 2: to understand the relation between cause and consequence in physical phenomena. For example, acceleration (learned in dynamics 1) is the result, caused by the exercise of a force and influenced by mass. The students will learn more about movements equations in dynamics 4. Dynamics 3: to understand torque which is a quantitative concept of lever principle. Next, the students will study energy conservation law and momentum conservation law. Here, by conducting a total review of physical quantities learned so far, the students will be prepared to comprehend dynamics 4. The students must pay attention to the differences in power and energy, that are easily confused. Dynamics 4: To understand constant velocity circular motion through the study of two-dimensional. As an application, the students will use simple vibration as an instrument to learn about sound and light waves. Furthermore, through the study of the law of universal gravitational attraction by Newton, the students will become aware of all the dynamic phenomena, represented by the equation of motion. To make the students perceive that if they can write the equations, they can solve it.				
Style		During each lesson (90 minutes) in the first half the teacher will explain the contents from in the textbook, and in the second half the students will participate in group-specific activities and solve problems together from the textbook. The students are required to read the textbooks in advance, to make team activities smooth and meaningful. Also, to acquire problem-solving and presentation style, we recommend the use of the support web page and videos. In the future, physical reversal classes will be abolished, so the students should focus on preparation for the classes from the beginning. Assignment: The students have to make and submit their "problem research note." The note contains explanations of the background and essence of each problem and not be used as a tool to show how much the student had studied. It also should include long-term vacations periods of study time. Test: The test problems are from high school physics book (the style of the problem is preserved, numbers and way of solving are changed), to avoid difference of interpretation between students and teacher, original questions elaborated by the teacher are not used. In resume, this course is centered on the problems from the textbook, in addition to other learning materials as the videos and the web page task, etc. The students should understand the textbook from corner to corner, as a third-party external evaluation system. In addition to the teachers' commentary, extra handouts may be distributed as a reference. I can solve Ichi's problems! This fact and feeling will give confidence to the students in other activities inside and outside the campus.				
Notice		Evaluation points: For specific calculation methods: https://sites.google.com/s.akashi.ac.jp/physics/ Re-examination: No retesting 5 absences will be excused. In junior high school, students think about something from zero. Learners who do not stand on the shoulder of the giants, are not only inefficient but also blaspheme. In the learning of physics, images from comics and animation may lead to erroneous concepts (simple concept) and sometimes interfere with correct understanding of physical phenomena. By acquiring the "style" of thinking developed by predecessor physics, you will become a sophisticated technician who is not misled by misconceptions and pseudoscience!				
Characteristics of Class / Division in Learning						
☒ Active Learning		☒ Aided by ICT		☒ Applicable to Remote Class		☐ Instructor Professionally Experienced
Course Plan						
			Theme	Goals		
2nd Semester r	3rd Quarter	1st	Vibration and resonance/resonance of the sounding body(p46-p53)	Can explain textbook's problems 294,288,300		
		2nd	Doppler effect(p54-p60)	Can explain textbook's problems 307,309,310		
		3rd	Properties of Light(p62-p71)	Can explain textbook's problems 317,318		
		4th	Lens (p72-p77)	Can explain textbook's problems 326,327,328		

		5th	Interference and refraction of light (p85-p89)	Can explain textbook's problems 337,338
		6th	Thin films and Newton rings (p90-p93)	Can explain textbook's problems 341,342
		7th	Electric field (p106-p116)	Can explain textbook's problems 351,349,353
		8th	Electric potential (p117-128)	Can explain textbook's problems 355,358,359
	4th Quarter	9th	CBT(Computer Based Testing)	Can explain CBT
		10th	Capacitance of Capacitors and Capacitors and Dielectrics (p129-p135)	Can explain textbook's problems 332,334,335
		11th	Capacitor connections and energy stored in capacitors (p136-p140)	Can explain textbook's problems 336,337,342
		12th	Ohm's law (p142-p147)	Can explain textbook's problems 357(1)~(4)
		13th	Joule heat and power and power and DC circuits (p148-p153)	Can explain textbook's problems 351,354,356
		14th	Kirchhoff's Law, batteries and the Wheatstone Bridge (p156-p159)	Can explain textbook's problems 360,363,365
		15th	Measurement of electromotive force and dc circuits with non-linear resistors and capacitors (p160-p163)	Can explain textbook's problems 367,368,369
		16th	final exam	Correctly answer more than 80 % of the test.

Evaluation Method and Weight (%)

	Examination	Other	Total
Subtotal	40	60	100
Basic Proficiency	40	60	100