

Tsuyama College		Year	2021		Course Title	Physics II	
Course Information							
Course Code		0037		Course Category		General / Compulsory	
Class Format		Lecture		Credits		School Credit: 2	
Department		Department of Integrated Science and Technology Communication and Informations System Program		Student Grade		2nd	
Term		Year-round		Classes per Week		2	
Textbook and/or Teaching Materials		"Physics", Tokyo Shoseki, Let's Try Note Wave and Heat, Physics Experiment Work Book					
Instructor		OKAMOTO Seiji,SASAI Yuji					
Course Objectives							
Purpose: Learn about the general properties of waves such as diffraction and interference, basic wave expressions, and sine waves as wave phenomena. For sound waves, learn howling, resonance phenomena, and Doppler effect. Regarding light, we will study the law of refraction, total internal reflection, the relationship between dispersion and spectrum and the color of light, and the scattering and interference phenomena of light in relation to natural phenomena and applications of modern science. Physics is the most basic field in the natural sciences and engineering. In this subject, you will learn about wave phenomena and learn how to calculate them.							
Attainment target: 1. Understand the basic properties of waves and explain diffraction and interference. 2. Calculate the reflection angle and refraction angle of light and understand the dispersion phenomenon.							
Rubric							
	Ideal Level		Standard Level		Acceptable Level		Unacceptable Level
Achievement 1		calculate sound diffraction and interference phenomena		Calculate complex wave motion		Calculate basic wave motion Can't do basic calculation of wave motion	
Achievement 2		Calculate the light interference phenomenon		Calculate light reflection angle and refraction angle		Calculate basic light reflection and refraction angles. can't do basic calculation of wave motion	
Assigned Department Objectives							
Teaching Method							
Outline		General / Specialty: General  Field of study: Common to natural sciences / basics  Learn about the general properties of waves such as diffraction and interference, basic wave expressions, and sine waves as wave phenomena. For sound waves, learn howling, resonance phenomena, and Doppler effect. Regarding light, we will study the law of refraction, total internal reflection, the relationship between dispersion and spectrum and the color of light, and the scattering / interference phenomenon of light in relation to natural phenomena and applications of modern science. Physics is the most basic field in the natural sciences and engineering. In this course, you will learn about collision / splitting of objects and wave phenomena, and learn how to calculate them.  Required / Required / Selected / Selected: Required  Basic disciplines: Mathematical science / physics / physics in general  Relationship with learning / educational goals: This subject is equivalent to the learning / educational goal "(2) Acquisition of solid basic science knowledge".  Relationship with engineer education program: The main goal of learning / education in this subject is "(A) Deepening of basic knowledge about technology, A-1: Acquiring knowledge in a wide range of natural sciences as basic knowledge about engineering."					
Style		Class method: Lecture-style lessons are conducted, and exercises and experiments are conducted. Demonstration experiments will be conducted to deepen understanding. In exercise class students are encouraged to write and explain their answers.  Grade evaluation method: 60% of 4 regular exams, 40% of exercises, quizzes, experiment reports, etc. Supplementary classes and re-examinations will be imposed on those with poor grades, and the score of the regular examination will be replaced with a maximum of 60 points.					
Notice		This course is a compulsory course, so it is mandatory to take it to complete the 2nd year course. Weekly, solve and review problems in textbooks and workbooks. Also, be sure to submit your homework report by the deadline.  Course advice: Calculate and understand the mathematical formulas used in class. If you are operating e-mail etc. during class, you may be asked to leave the room. If the class starts within 25 minutes, it will be late, and 3 times late will result in 1 absence.  Basic subjects: Basic mathematics (1 year), Basic mathematics exercise (1), Physics I (1) Related subjects: Mechanics I (3 years), Mechanics II (3)					
Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input type="checkbox"/> Aided by ICT		<input type="checkbox"/> Applicable to Remote Class		<input type="checkbox"/> Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
1st Semester	1st Quarter	1st	Guidance, Wave Properties ("Physical Basics")		Understanding how to learn Understanding of transverse / longitudinal waves and how to represent waves		

2nd Semester		2nd	Vibration and waves of medium ("physical basis")	Understanding wave propagation due to medium vibration
		3rd	Standing wave ("physical basis")	Understanding of wave superposition
		4th	Standing wave, reflection ("physical basis")	Understanding standing waves Understanding free-end and fixed-end reflections
		5th	Sound and vibration ("physical foundation")	Understanding sound and vibration
		6th	Natural vibration of strings	Understanding string vibration
		7th	Experiment (standing wave of string)	Checking the vibration of the strings
		8th	First midterm exam (related to the above contents)	Score of 60 points or more
	2nd Quarter	9th	Explanation and return / natural vibration of air column resonance ("Physical Basics")	Review of exam questions Understanding of air column resonance
		10th	Experiment (measurement of sound velocity by air column resonance)	Understanding of air column resonance
		11th	Representation of waves, Huygens principle (hereinafter "physics")	Understanding the expression of waves Understanding the Huygens principle
		12th	Law of reflection, law of refraction	Understanding and utilizing Huygens principles
		13th	Wave Diffraction / Interference Wave Properties	Understanding and utilizing wave interference
		14th	The nature of the interference wave	Understanding and utilizing wave interference
		15th	Exam: Contents after the first half of the term)	Score of 60 points or more
		16th	Explanation and return / nature of sound	Review of exams / understanding of the nature of sound
2nd Semester	3rd Quarter	1st	Guidance / Nature of sound	Understanding the nature of sound
		2nd	Doppler effect	Understanding the Doppler effect
		3rd	How light is transmitted	Understanding how things look and how to measure the speed of light
		4th	Reflection and refraction of light	Understanding light reflection and refraction
		5th	Young's experiment	Understanding light interference
		6th	Diffraction grating	Understanding light interference
		7th	Experiment (light interference)	Confirmation of light interference
		8th	Exam (related to the above contents)	Score of 60 points or more
	4th Quarter	9th	Test commentary and return / interference due to thin film	Review and understanding of test contents / understanding of light interference
		10th	Interference by thin air layer	Understanding light interference
		11th	Interference by thin air layer	Understanding light interference
		12th	Lens	Understanding how the lens works
		13th	Mirror	Understanding how the mirror works
		14th	Experiment (image by lens)	Checking the function of the lens
		15th	Exam	Score of 60 points or more
		16th	Exam return and answer commentary	Review and understanding of exam content

#### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	50	0	0	0	25	25	100
Basic Proficiency	50	0	0	0	25	25	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0