Case Format	U. a set and			
	Mechatronics	Number of Credits Student Category	1.5 Year 3	4
Period of Study	Semester 1 KOSEN Textback Series Pi	Clesses per Week	3 ics and Waves,	1
Required Materials	H. Ushio et al., Morikita Put KOSEN Textbook Series Pit H. Ushio et al., Morikita Put	sishing Co, Ltd. ISBN978 nysics volume 2. Heat, Ele bishing Co, Ltd. ISBN978	3-4-627-15811-4 actricity and Magnetism, and Atoms, 3-4-627-15521-4	-
Instructor Course Objective There are various types of enginee Presses 5 is continued from Physics	Naruemon Husangkham	knowledge and applicati s 5. Physics 5 is orginally	on of physics, especially in mechatronics, designed to be on a focus of optics and	]
audmic britsics, in its subject is ame and introduction of quantum mech and understanding.	to to deepen students undersam nanics. The assignment is designed	i to help the students to	onic prysics including nuclear physics develope knowledge, problem solving skill	
Evaluation(Rubrio)	Ideal Level of Achievemen (Very Good)	t Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)	]
Understanding concepts of physic their relations	and Ability to correctly understand and explain concetts in Physics and connect with real life experiences.	Ability to fairly understand and explain concepts in Physics and connect with real life experiences	Lacks of the appropriate knowledge and understanding in Physics, Unclear Inkages of physics concepts from different contents.	
Mastering mathematical and graph expressions skills,	ical Ability to describe equation and show good understanding by using graphs with necessary details and vice versa.	8 Ability to fairly describe equations and show understanding by using graphs and using graphs and	Equations are limited or inaccurate. Graphs are incomplete or absent.	-
Problem Solving	Ability to provide a clear and logical econession from general concept/ ecuation to solve specific problems with different conditions, A final numerical answers are correct with appropriate units and calculations	Ability to fairly Ability to fairly rovide some logical expression from general concepts/exu ations to solve specific problems with different conditions in calculations, algebraic, or units,	Provide an unclear logical progression or solution which is very difficult to follow. Major allabraic and/or other mathematical mistakes in solutions.	
G(1) Wide knowledge on Science Please change Please change	Relationship with L e and Engineering and practice	saming Outcomes I ability to apply them t	o active problems in the accisty,	-
Teaching Method				1
Outline:	Students will study basic or intraduction of quantum m the fundamental laws and	Students will study basic concepts and principles of optics, atom and nucleus in physics and introduction of cuantum mechanics, Students are expected to develop an accreciation of the fundamental laws and principles and their applications to solve baical problems.		
Class Format: Please Note :	Lecture/exercise, and mini- The students are requester ensure further study by on within a week after it is ass score = 100 points (submis 65 points (submission after exam date)).	Lab/demonstration 3 to keep hard copies or - self, Assignment is roous ganed. If not, there will be sion within a week). 80 p r Physics' final exam date	Instrumin files of all submitted material to issted to automit in google classroom score deduction for late submission full opints (submission after one week) and and O points (2 weeks after the final	
Course Plan				
Semester 1 1st week	Contents and Me Reviews of 1	thod of Course	Goals Check what students' recognition of light waves from physics 4 and what will be applied in this course. To explain concert of actival costs how the	Related MC
2nd week	Interference of light due to	o thin film and Newton's	To explain the concept of light waves and its properties' interference due to thin tim and Newton's ring, and its	
3rd week	Anti-Reflect	ion coating	Carculation,	
4th week	Polarization and Lab: Mai	l polarizer, and ua' law	caculation and application. To explain the concepts of the polarization of light waves and the classification of three types of polarizations and how polabizer works.	I-A 1 I-B 1 I-B 1 I-B 1 I-B 1
5th week	Images forme	d by mirrors	To explain the concepts of images formed by flat and spherical mirrors and to apply the mirror's equation.	I-B i
6th week	Images form	ad by lenses	To exclain the concepts of images formed by thin lenses and to apply the lens' equation.	
7th week	Optical instru Lab: focal length of	ments, and a converging lens	To explain the concepts of optical instruments,	I-B 1 I-B 1 I-B 1 I-B 1 I-B 1
8th week	Wrap-up of first I	nall of semester	Review of content week 1 - 7	
9th week	Midterm Ex	amination	Midterm examination of week 1-7	
10th week	Ato	me	To exclain the atomic theory timeline, and calculate the basic or antifies, e.g., the wavelength of the EM wave generated from the electron transition of a hydrogen atom and the radius of the electron orbit.	
11th week	Structure of at	amic nucleus	To exclain the nucleus structure and the stability of nuclei, in addition to calculate the basic quantifies such as the radius of a nucleus from the mass number and the binding energy.	
12th week	Nuclear decay	and radiation	First, explain radioactive decay, different types of radiation, and radiation measurements. Second, calculate quantities related to radiation and radioactive decay rate. Third, develop various skills, such as experimental skills, data and reporting skills,	I-8 1
13th week	Electrons and other e	ilementary particles	To explain the discovery of the electron and the differences among various bytes of discharge tubes. Calculate the basic parameters for describing the behavior of an electron in an electric field and a magnetic field, Lastly, explain the existence of other elementary particles.	I-B 1
14th week	Weve-parts	cle duality	Explain wave-particle duality, including the particle nature of light and the diatrone. Calculate basic ountilies related to wave-particle duality, such as the work functions of matella, the peak frequency of blackbody radiation, the spacing burven planes of atoms, and the raduction in wavelength of light after solutioning with an electron.	I-B 1
15th week	Introduction of au	antum mechanics	Explain certain basic quantum concepts, e.g., Schrödinger, equation, quantum tunnelling. Heisenberg uncertainty principle. Pauli is exclusion principle, supercosition of quantum states, measurement and quantum entanglement.	
16th week	Quantum t	schnology	Relate basic quantum concepts to modern technology	
17th week	Review of 10th-14th	weeks & Mock exam	Review of content week 10-14	
18th week	Final Exa	mination	Final examination of week 10-14	
			1	1
19th week	Return Exam Papers and 9889	Feedback, and special ons	Review and feedback	
19th week	Beturn Exam Papers and	I Feedback, and special	Review and feedback	   
19th week	Return Exam Papers and sessi Examination 60	Feedback, and special ons	Review and feedback	