Science 2 (Physics)

Basic Course Information

Course Number	03005020	**Subject Category**	Compulsory(G)
Class Format	Lecture	**Credit Type and Number of Credits**	1.5
Department	Electrical and Electronics	**Student Category**	Year 1
Period of Study	Semester 2	**Classes per Week**	3
Required Materials	KOSEN Textbook Series Physics volume 1, Mechanics and Waves, H. Ushio et al., Morikita Publishing Co., Ltd. ISBN978-4-627-15511-4		
Instructor	Sravut Sasom		

Course Objective

This course introduces basic concepts of science such as (P) momentum and collision/ uniform circular motion/ simple harmonic motion/ angular motion/ universal gravitation/ static equilibrium/ rotation of rigid body.

Evaluation (Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Understanding concepts of physics and their relation	Show very good knowledge and understanding of concepts in physics. Good connections among these concepts and mathematical procedures to correctly solve problems or answer questions.	Show good knowledge and understanding of typical physics concepts. Good connections among these concepts and mathematical procedures to solve problems, but occasionally may make minor errors.	Lacks the appropriate knowledge and understanding of concepts in physics. Weak connections among these concepts.
Mathematical and graphical representation	Show good understanding and graphs are logical with sufficient details to describe the content	Show understanding and graphs are reasonable with the content, but not with details.	Describe insufficiently in the content. Equations are limited or inaccurate. Graphs are incomplete or absent of information.
Problem Solving	Provide a clear and logical progression from general concepts equations to solve specific problems with different conditions. All final numerical answers are correct with appropriate units and calculations.	Provide a logical progression from general concepts/equations to solve specific problems with minor mistakes in calculation, algebraic, or units.	Provide an unclear logical progression or solution which is very difficult to follow. Major algebraic and/or other mathematical mistakes in solution.

Relationship with Learning Outcomes

G(1) Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.

Please change

Please change

Teaching Method

Outline:	Students will study basic concepts and principles of mechanics in physics. Students are expected to develop an appreciation of the fundamental laws and principles and their applications to solve typical questions.
Class Format:	Lecture, exercise and experiment
Please Note :	All materials will be posted on the Google classroom. The student is requested to keep photo copies or files of all submitted material to ensure further study by oneself. Assignment is requested to submit in google classroom within a week after it is assigned. If not, there will be score deduction for late submission (full score = 100 points (submission within a week), 80 points (submission after one week) and 65 points (submission after Physics' final exam date) and 0 points (2 weeks after the final exam date)).

Course Plan

Semester 2	**Contents and Method of Course**	**Goals**	**Related MCC**
1st week	Guidance: Introduction, Impulse and momentum	Calculate momentum based on mass and velocity of object.	‖-A 1 27 ‖-A 1 28
2nd week	Law of conservation of momentum, Coefficient of restitution and collision and rebound	Use the momentum conservation law for the calculation of various physical quantities. Calculate coefficient of restitution and collision and rebound	‖-A 1 29
3rd week	Uniform circular motion	Perform calculations relating to velocity, angular velocity, acceleration and centripetal force of objects in uniform circular motion.	‖-A 1 32
4th week	Simple harmonic motion	Explain the relationship between displacement, velocity, acceleration, and force in relation to the simple harmonic motion.	‖-A 1 30 ‖-A 1 31
5th week	Experiment: Simple harmonic motion	Do experiment related to simple harmonic motion	‖-A 1 30 ‖-A 1 31 ‖-B 1 1 ‖-B 1 2 ‖-B 1 4 ‖-B 1 5 ‖-A 1 33
6th week	Universal gravity and planetary motion 1	Calculate the gravity acting between objects using the law of universal gravitation.	
7th week	Universal gravity and planetary motion 2	Perform calculations related to planetary motion	‖-A 1 34
8th week	Summary of Week 1 - 7	Preparation for midterm examination (if any)	
9th week	Midterm Examination	For week 1-8	
10th week	Return Midterm Exam and feedback, Moment of the force	Understanding return midterm exam and feedback. Calculate the moment of forces.	‖-A 1 35
11th week	Static equilibrium of rigid body	Perform calculations relating to the equilibrium of forces of rigid bodies.	‖-A 1 38
12th week	Center of gravity, center of mass and object stability	Perform calculations relating to the center of gravity. Consider rigid body tilting and unstable balancing and toppling	‖-A 1 39
13th week	Rotational equation of motion	Perform calculations relating to the rotational motion of rigid bodies using the rotational equation of motion.	‖-A 1 41
14th week	Moment of inertia and angular momentum	Perform calculation of the moment of inertia for simple shapes, such as a uniform rods and angular momentum.	‖-A 1 36 ‖-A 1 40
15th week	Experiment: Rotational motion	Do experiment related to rotational motion	‖-A 1 40 ‖-A 1 41 ‖-B 1 1 ‖-B 1 3 ‖-B 1 4
16th week	Conservation of angular momentum and rotational energy	Explain the principle of conservation of angular momentum showing specific examples.	‖-A 1 37
17th week	Summary of Week 10- 16	Preparation for midterm examination (if any)	
18th week	Final Examination	For week 10-17	

Do not

	Examination	**Quiz**	**Mutual Evaluations between students**	**Report**	**Portfolio**	**Other**
Basic Ability	60	30		10		
Technical Ability						
Interdisciplinary Ability						

	Physics	**Chemistry**	**Life Science**	**Earth Science**
Ratio of science	50%	50%	0%	0%