

Science 3 (Physics)

Basic Course Information	
Course Number	0005021
Class Format	Lecture
Department	Chemistry
Period of Study	Semester 1
Required Materials	Physics 1: Introduction to Mechanics, 2nd Edition, by John Wiley & Sons, Inc. ISBN: 978-1-119-32164-4
Instructor	Andri Phrasak

Subject Category	Chemistry/19
Credit Type and Number of Credits	1
Student Category	Year 2
Classes per Week	2

Course Objective

There are various boxes of engineering problems that require a good knowledge and application of physics. Physics 3 is a continuation of Physics 2, it is the physics part of Science 3. The course provides students with basic knowledge and concepts of physics in introduction of fluid mechanics, and introduction of thermodynamics (temperature and heat), specific heat work and heat, thermodynamics cycles, heat engine.

The exercise and homework are designed to help the students to develop knowledge, problem solving skills and

Evaluation/Rubric	Ideal Level of Achievement (Near Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fair)
Understanding concepts of physics and the	Ability to correctly understand and explain concepts in Physics and connect with real life experiences.	Ability to fairly understand and explain concepts in Physics and connect with real life experiences but with some mistakes.	Lacks the appropriate knowledge and understanding of concepts in Physics. Weak connection among these concepts.
Mastering mathematical and graphical expressions skills.	Ability to describe equations and show good understanding for using graphs with necessary details and vice versa.	Ability to describe equations and show understanding for using graphs and vice versa, but not in detail.	Equations are limited or inaccurate. Graphs are incomplete or absent.
Problem Solving	Ability to provide a clear and logical solution from general concepts to solve specific problems with different conditions. All final numerical answers are correct with appropriate units and calculations.	Ability to provide some logical reasoning from general concepts to solve specific problems with different conditions but with mistakes in calculations, algebraic, or units.	Provide an unclear logical presentation or solution which is very difficult to follow. Major mistakes and/or other mathematical mistakes in solution.

Relationship with Learning Outcomes

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

Please choose

Please choose

Teaching Method

Outline: Students will study basic concepts and principles of fluid mechanics and

Class Format: Lecture/seminar and Mini-Lab and Demonstration.

Please Note 1: The student is requested to keep photo copies or files of all submitted material to

Course Plan	Semester 1	Contents and Method of Course	Goals	Related MCC
1st week		Introduction and Fluid mechanics 1	Guidance and appreciation of Aristotle, buoyant forces, and Archimedes' principle	
2nd week		Fluid mechanics 2	Appreciation of fluid dynamics, Bernoulli's equation, flow of viscous fluid in pipes, and Mini-Lab.	
3rd week		Elasticity	Understanding elastic properties of solids.	
4th week		Introduction to thermodynamics	Checking what students already learned about thermodynamics and understand what they will learn in the course.	1-A, 1-42 1-A, 1-43
5th week		Temperature and Heat (1) Specific Heat and Heat Capacity	Perform calculations using heat capacity and specific heat of objects. Write a formula summarizing the law of conservation of heat then calculate heat capacity and specific heat.	1-A, 1-44 1-A, 1-45 1-A, 1-46
6th week		Temperature and Heat (2) Thermal expansion and Temperature measurement	Appreciation of concepts of temperature and heat about thermal expansion and temperature measurement.	
7th week		Temperature and Heat (3) Change of State and Latent Heat	Appreciation of concepts of temperature and heat about change of state and latent heat.	
8th week		Wrap-up of 1st half of semester (Review)	Review and summarize learning.	
9th week		Midterm Examination	For week 1-8	
10th week		Return Midterm Exam Papers and Feedback	Review learning.	
11th week		Gas laws	Perform calculations relating to pressure, temperature and volume of gas using Gas laws and the equation of state for the ideal gas, and Mini-Lab 1.	1-A, 1-47 1-B, 1-48
12th week		Kinetic energy of gas	Explain the kinetic energy of a gas by using the relevant principles associated with its molecular motion and temperature.	
13th week		Internal energy of gas	Explain the internal energy of gas.	1-A, 1-49
14th week		First law of thermodynamics and thermodynamic process (1)	Explain the first law of thermodynamics as well as isochoric change, isobaric change and adiabatic change.	1-A, 1-49
15th week		Thermodynamic process (2) and Thermal cycle	Continuation from the previous week and introduce of thermal cycles.	
16th week		Heat engine (1)	Perform calculations relating to thermal efficiency of heat engines.	
17th week		Heat engine (2)	Perform calculations relating to thermal efficiency of heat engines.	
18th week		Wrap-up of 2nd half of semester (Review)	Review and summarize learning.	
19th week		Final Examination	For week 11-18	
20th week		Return Exam Papers and Feedback, and Special sessions	Review and summarize learning.	

Done!

Basic Ability	Emphasis	Unit	Mean Evaluation between students	Report	Particip	Other
	62	35		10		
Intermediate Ability						