KENNESAW STATE UNIVERSITY

SYLLABUS
COLLEGE OF SCIENCE AND MATHEMATICS
DEPARTMENT OF PHYSICS, CSM

PHYS 2211: PRINCIPLES OF PHYSICS I
FALL 2024

Course Information

Class meeting time: *MWF 8:00 am - 8:50 am*
Modality and Location: *Academic Building, Room 200* **(in-person)**

Recitation time: Section 67 – *M 9:00 am - 9:50 am @ Academic Building, Room 322* **(in-person)**
Section 68 - *W 9:00 am - 9:50 am @ Academic Building, Room 322* **(in-person)**
Section 69 - *F 9:00 am - 9:50 am @ Academic Building, Room 322* **(in-person)**

Instructor Information

Name: Dr. Karunananda Pemasiri
Email: kpemasir@kennesaw.edu
Office Location: Crawford Lab Building - Room E130
Office Phone: 470–578–3431
Office Hours: *MWF @ 10:00 – 11:00 am* and *TR @ 11:00 am – 12:00 pm* or *by appointment*

Preferred method of communication: *email* (Do not email through D2L)

Course Description

Prerequisite: *A grade of "C" or better in MATH 1190*

This course is an introductory calculus-based course on classical mechanics, waves and special relativity. The student will be able to apply Newton's laws and conservation of energy and momentum to various problems in kinematics and dynamics, use the law of universal gravitation to falling objects and orbital motion, describe simple harmonic motion, oscillations, and waves, and explain the basic ideas of special relativity.

The student must have a strong grasp of algebra, trigonometry, and calculus without exception, as these subjects will be heavily utilized throughout the course. Calculus will aid in developing concepts, which will subsequently be applied to problem-solving.

Course Materials

Required Texts: Physics for Scientists and Engineers with Modern Physics, Serway and Jewett, 10th ed. (Access to WebAssign will also provide access to eBook)

PHYS 2211/2212 is part of a textbook program called Day One Access. Prior to classes starting, you should have received an e-mail from the KSU bookstore (dayone@kennesaw.edu) with pricing and your personalized link to opt out (please check your

junk folder if not in your inbox). You will also receive one on the first day of class and then a reminder email the day prior to the opt-out deadline.

You will access the eBook or courseware through D2L on the content tab.

The purpose of Day One Access is to make sure that you have access to the digital course materials on the first day of class at a highly competitive rate. Everyone enrolled in the course will automatically have access to the digital course materials through drop/add. Your Owl Express account has already been charged for these materials, and you will have through the drop/add to opt-out and receive a refund. Should you opt out, the refund will be processed but will lose access to the materials. Please check your email for the link to opt-out if you choose to do so. The opt-out deadline is August 16th, 2024 at 11:59 pm

Please note, should you opt-out you will need to purchase your required materials directly from the publisher or other sources.

Technology requirements: A scientific calculator with basic scientific calculations is required. A cellphone cannot be used as a scientific calculator.

Learning Outcomes

After completion of this course, students will be able to:

1. Explain and interpret physical situations as stated in a word problem.
2. Analyze and solve kinematical and dynamics problems using pictorial, graphical, physical, or mathematical representations (including calculus and vectors)
3. Apply the laws of motion and conservation laws of energy and momentum to address problems in mechanics.
4. Use principles of physics, algebra, and calculus to solve problems in mechanics symbolically and numerically.
5. Solve complex real-world problems by constructing one or more physics models that can be classified and analyzed.

Course Structure

In this class, I will employ an effective and proven teaching methodology known as "Active Learning". Through a combination of interactive lectures, problem-solving recitations, homework assignments, quizzes, and exams, students will engage in a dynamic learning process that reinforces theoretical concepts and strengthens practical application.

1. **Lectures:** The course will consist of 15 weeks of interactive lectures that will cover fundamental theoretical concepts and real-world applications related to course topics. Active participation of the students is encouraged through discussions, polls, and group activities. To prepare for each class, you will be required to read, or watch assigned materials in advance. This will provide a foundation for the discussions and activities in the class.

2. **Problem-Solving Recitations:** In addition to lectures, there will be problem-solving recitation sessions held every week throughout the course where students work in groups. These sessions will provide students with the opportunity to work on challenging problems related to the lecture material. Students will be guided through the problem-solving process and offer personalized assistance.

3. **Homework Assignments:** There will be homework assignments throughout the course, designed to reinforce concepts taught in lectures. Homework will consist of both theoretical questions and practical exercises.

4. **Unannounced Quizzes:** Throughout the course, there will be unannounced quizzes during class sessions and through WebAssign. These quizzes may cover the assigned readings, as well as the material discussed in the current lecture or previous lectures. They serve to assess your understanding and encourage continuous engagement.

5. **Unit Exams:** The course will include four comprehensive unit exams. These exams will cover material covered during specific periods of the course, including lectures, recitations, and homework. These exams will test both theoretical knowledge and problem-solving skills.

6. **Final Exam:** The final exam will be comprehensive, covering all material covered throughout the course. This exam will assess students' understanding of the entire course content and their ability to apply concepts to new scenarios.

Course Requirements and Assignments

Homework:
Homework assignments and homework grading will be done through the WebAssign on-line homework tool (https://www.webassign.net). There will be homework each week. Homework must be submitted on or before the due date. However, extensions for assignments can be granted but with a penalty. Extension requests should be done before the original deadlines through WebAssign.

You may discuss the homework problems with each other, and I encourage discussions among students. You also can find my help in tackling homework problems. The solutions that you submit must be entirely yours and in your own words with detailed explanations if necessary. If you use the internet as a guide, please cite those websites. Any copied or plagiarized work will receive a zero.

Exams: You will be given three-unit exams (lowest score will be dropped) and a comprehensive final exam. These exams will be closed book examinations. You are allowed to bring one page of the equation sheet for the unit exams, and for the final exam. There will be no make-up exams for unit exams. If a unit exam is missed, that will be the exam score that is dropped.

Unit Exam 1 – *September 4th, 2024*
Unit Exam 2 – *October 2nd, 2024*
Unit Exam 3 – *November 11th, 2024*
Unit Exam 4 – *December 2nd, 2024* (online examination through WebAssign)

Final Exam – *December 9th, 2024 @ 8:00 – 10:00 am*

Do not make any plans that might conflict with the final exam. The mandatory final exam **will not** be individually rescheduled to accommodate any other plans.

Important Dates:
Last day to drop/Add: *11:45 pm on August 16th, 2024*
Last day to withdraw without Academic Penalty: *11:45 pm on October 25th, 2024*

Evaluation and Grading Policies

Component	Weight	Note
Recitations	10%	(lowest will be dropped)
Homework Assignments	20%	(lowest will be dropped)
Quizzes	5%	(lowest will be dropped)
Unit Exams	40%	(closed-book, lowest will be dropped)
Final Exam	25%	(closed-book)

GRADING SCALE:

90%	-	100%	A
80%	-	89%	B
70%	-	79%	C
60%	-	69%	D
0%	-	59%	F

I will round up grades if they are ≥ 0.9; for example, 89.1 is an A, but 89.0 is a B.

Course Policies

Attendance Policy: Your active, engaged participation in each class period contributes to the learning experience. To ensure that you learn well and perform well, please arrive on time and prepared, remaining until class is over.

Homework Policy: You MUST turn in your homework through WebAssign by the deadline. No late submission is accepted as solutions will be posted through WebAssign after the due date. However, extensions for assignments can be granted but with a penalty. Extension requests should be done before the original deadlines through WebAssign. There will be a 2% deduction for each day an assignment is submitted late from the original due date, for a maximum of five days. No extensions will be granted beyond five days without a valid reason supported by documentary evidence.

Email Policy: If you have questions or concerns about our course, please send your messages to kpemasir@kennesaw.edu. I will do my best to respond within 24 hours Monday-Friday. While I will also respond to messages sent through the D2L email client, it may take longer for me to respond. If you prefer to communicate in person, you may visit me during our regularly scheduled office hours.

Exam Policy: Use of a basic scientific calculator is allowed during examinations. All other electronic devices like mobile phones, laptops, tables are not allowed to be used during the examination. No make-up examinations will be scheduled on an individual basis. If you missed a unit exam, that will be the unit exam grade that will be dropped from the final grade calculation. Do not make any plans that might conflict with the final exam as it will not be individually rescheduled to accommodate any other plans.

AI Use Prohibited:
You are expected to generate your own work in this course. When you submit any kind of work, you are asserting that you have created it completely on your own unless you indicate otherwise using quotation marks and proper citation for the source(s) you used to help you. Submitting content that has been generated by someone other than you, or that was created or assisted by an AI generative tool is cheating and constitutes a violation of the KSU Code of Academic Integrity.

Institutional Policies & KSU Student Resources

The Following links contain information on Institutional Policies, help and resources available to students: Syllabus-Policy and Student Resources

CARE SERVICES

Any student experiencing financial hardship and believes this may affect their academic success is urged to complete an Emergency Assistance Application with CARE Services. The Emergency Assistance Program supports students in overcoming unforeseen hardships hindering their academic progress. For help, go to Emergency Assistance or email emergencyassistance@kennesaw.edu.

Course Schedule

Week	Date	Tentative Topics (subject to minor changes*)
1	Day 1 – 12th Aug 2024	Introduction to the Course, Physics & Measurements (CH01)
	Day 2 – 14th Aug 2024	Dimension Analysis (CH01)
	Day 3 – 16th Aug 2024	Motion in one Dimension (CH02)
2	Day 1 – 19th Aug 2024	1D Motion with Constant Acceleration (CH02)
	Day 2 – 21st Aug 2024	Vectors, Vector addition and Subtraction (CH03)
	Day 3 – 23rd Aug 2024	Vectors in Cartesian Coordinates (CH03)
3	Day 1 – 26th Aug 2024	Motion in Two Dimension (CH04)
	Day 2 – 28th Aug 2024	Projectile Motion (CH04)
	Day 3 – 30th Aug 2024	Uniform Circular Motion (CH04)
4	Day 1 – 02nd Sep 2024	**Holiday - Labor Day 2024**
	Day 2 – 04th Sep 2024	**Unit Exam 1** (on topics covered in chapters 01 - 04)
	Day 3 – 06th Sep 2024	Concept of Force and Newton's laws of Motion (CH05)
5	Day 1 – 09th Sep 2024	Gravitational Force and Weight, Free Body Diagrams (CH05)
	Day 2 – 11th Sep 2024	Application of Newton's Laws (CH05)
	Day 3 – 13th Sep 2024	Non-Uniform Circular Motion (CH06)
6	Day 1 – 16th Sep 2024	Motion Under Resistive Forces (CH06)
	Day 2 – 18th Sep 2024	Energy and Work, Work done by a force (CH07)
	Day 3 – 20th Sep 2024	Kinetic Energy and Work-Kinetic Energy (CH07)
7	Day 1 – 23rd Sep 2024	Potential Energy, Conservative & Non-Conservative Forces (CH07)
	Day 2 – 25th Sep 2024	Conservation of Energy, Isolated and Non-Isolated Systems (CH08)
	Day 3 – 27th Sep 2024	Changes in Mechanical Energy under Non-Conservative Forces (CH08)
8	Day 1 – 30th Sep 2024	Conservation of Energy under Non-Conservative Forces, Power (CH08)
	Day 2 – 02nd Oct 2024	**Unit Exam 2** (on topics covered in chapters 05 - 08)
	Day 3 – 04th Oct 2024	Linear Momentum, Force and Impulse (CH09)

9	Day 1 – 07th Oct 2024	Collisions in One Dimension (CH09)
	Day 2 – 09th Oct 2024	Collisions in Two Dimensions (CH09)
	Day 3 – 11th Oct 2024	Center of Mass and Center of Gravity (CH09)
10	Day 1 – 14th Oct 2024	Rotation of a Rigid Object, Translational and Rotational Motion (CH10)
	Day 2 – 16th Oct 2024	Torque, Moment of Inertia, Rotational Kinetic Energy (CH10)
	Day 3 – 18th Oct 2024	Rolling Motion of Rigid Objects (CH10)
11	Day 1 – 21st Oct 2024	Angular Momentum, Conservation of Angular Momentum (CH11)
	Day 2 – 23rd Oct 2024	Rotational Collisions and Precession (CH11)
	Day 3 – 25th Oct 2024	Stress & Strain & Elasticity (Hooke's Law) (CH12)
12	Day 1 – 28th Oct 2024	Static Equilibrium of Rigid Objects (CH12)
	Day 2 – 30th Oct 2024	Gravitational Force and Field (CH13)
	Day 3 – 01st Nov 2024	Gravitational Potential Energy and Potential (CH13)
13	Day 1 – 04th Nov 2024	Simple Harmonic Motion and Energy (CH15)
	Day 2 – 06th Nov 2024	Simple Pendulums and Physical Pendulum (CH15)
	Day 3 – 08th Nov 2024	Damped and Force Oscillations (CH15)
14	Day 1 – 11th Nov 2024	**Unit Exam 3** (on topics covered in chapters 09 - 15)
	Day 2 – 13th Nov 2024	Wave Propagation, Transverse and Longitudinal Waves (CH16)
	Day 3 – 15th Nov 2024	Traveling Wave, Wavelength, Frequency and Wave Speed (CH16)
15	Day 1 – 18th Nov 2024	Galilean Relativity and Michelson-Morley Experiment (CH38)
	Day 2 – 20th Nov 2024	Eistein's Postulates and Consequences of The Special Theory of Relativity (CH38)
	Day 3 – 22nd Nov 2024	Review
25th Nov 2024 – 01st Dec 2024		**Fall Break (No classes)**
Last Day- 2nd Dec 2024		**Unit Exam 4** (Online examination through WebAssign)
Monday, December 9th, 2024		**Final Exam (8:00 am – 10:00 am)**

*Please be aware that the syllabus may undergo slight modifications based on how it progresses in alignment with students' learning experiences. However, there will be no changes to the examination dates.