PHYS2211
Principles of Physics I (Calculus based)
Spring 2020
Dr. Marco Guzzi
Students should use Class key: **kennesaw 5965 5415** to enroll in WebAssign

This syllabus and other info about PHYS2211 are available at the link below
http://facultyweb.kennesaw.edu/mguzzi/

Office: Room SC436 (4th floor, Science Building, Kennesaw Campus)
Phone: (470) 578-4583
email: mguzzi@kennesaw.edu (When e-mailing, **put "PHYS2211" in the subject line** along with the subject of your message.)
Please DO NOT use D2L or WebAssign to email me, otherwise you will not get a reply.
Please USE ONLY your KSU email address to email me, otherwise you will not get a reply.

Lectures: Tuesday and Thursday 11:00am-12:15pm, Science Building Room 109
Recitations: Tuesday 12:30pm-1:20pm, Mathematics & Statistics Bldg - Room 6 (24 students CNR 14173)
Recitations: Tuesday 2:00pm-2:50pm, Clendenin Bldg - Room 1003 (24 students CNR 14256)
Recitations: Thursday 12:30pm-1:20pm, Mathematics & Statistics Bldg - Room 6 (24 students CNR 14188)
Recitations: Thursday 2:00pm-2:50pm, Clendenin Bldg - Room 1003 (24 students CNR 14505)

Office hours:
Tuesday and Thursday 3pm - 4pm

Textbook: Physics for Scientists and Engineers with Modern Physics, Serway and Jewett, 10th ed.

Catalog course description
PHYS 2211 - Principles of Physics I (**calculus based**)
4 Class Hours 0 Laboratory Hours 3 Credit Hours
Prerequisite: a grade of "C" or better in MATH 1190.

Students are expected to have basic knowledge of calculus: this basic knowledge should approximately match Appendix B1-B6 of the textbook.

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 analyze the behavior of falling objects and objects in orbital motion, describe simple harmonic motion, oscillations, and waves, and explain the basic ideas of special relativity.

Course content
PHYS 2211 is a calculus-based course on classical mechanics and related topics.
This means that symbolic calculus, vector calculus, derivatives and integrals will be heavily used during the course. Problem solving is emphasized. Homework is an integral part of the course.
The course will cover one- and two-dimensional motion, Newton's laws, work and energy, momentum and collisions, rotational motion, rigid object motion, gravitation, simple harmonic motion, waves, and special relativity. Vector calculus is introduced in the first part of the course and is extensively used throughout the entire course.

Course material
The material is presented by using handwritten notes, white board, Power Point presentations, and videos when necessary.

Learning Outcomes
The topics covered in this course constitute the most fundamental background for a pathway in science and engineering. The overarching objective of this course is to provide an appreciation for the power of physical law and an understanding of its logic, beauty and universality, including the connection between symmetries and conservation laws in physics. Some specific objectives are listed below:

1. Analyze and solve kinematical problems for systems moving in one and two dimensions using pictorial,

graphical, physical, or mathematical representations (including calculus and vectors) of the system, and other representations as appropriate.
2. Analyze and solve statics and dynamics problems using Newton's laws (including the law of gravitation) in one and two dimensions using multiple representations including free-body diagrams and mathematical descriptions (including calculus and vectors) of the system.
3. Analyze and apply the conservation laws (energy and momentum) for linear and rotational systems, and develop solutions using multiple representations, including pictorial, graphical, or mathematical (including calculus and vectors) descriptions as appropriate.
4. Explain simple harmonic motion and compute parameters related to it in such applications as mass-spring oscillators, simple pendulums, and sinusoidal transverse waves.
5. Use special relativity to analyze differences in the behavior of objects as observed in different inertial reference frames, and explain the equivalence of mass and energy.

Do's and Don'ts
1. You must study assigned chapters in the textbook and other assigned readings **before** the lecture in which they are discussed.
2. Regular lecture attendance is essential for success in this class. If you must miss class, it is your responsibility to get the notes you miss from another student.
3. Be on time for class.
4. Cellular telephones, pagers, and similar devices must be turned off or placed in silent mode during class. Use of cell phones should be restricted to emergencies.
5. The usage of calculators able to take derivatives and integrals of functions (for example like TI-84 Plus) is strictly forbidden. That is considered cheating. You are allowed to use ONLY standard scientific calculators.
6. In class, avoid conversation and other disruptions that may distract other students from listening and learning. If you have a question or comment, direct it to the professor.
7. Rude and disrespectful student behavior is not tolerated (administrative actions may be taken).
8. Occasionally, it may be necessary for the instructor to make corrections or changes to the syllabus. Correc tions or changes to the syllabus will be announced on D2L (see below) and in class: students are expected to check D2L for announcements at least once or twice a day.

Grading policy
Four tests will be given during the semester. Your final grade will be determined based on your performance on **only three tests** (lowest grade test will be dropped).
Homework: **10%**
Tests: **60% (3 tests, 20% each)**
Final Exam: **30%**
Grades: **A >89.99%; B 79.99% - 89.99%; C 69.99%-79.99%; D 59.99%-69.99%; F <59.99%**

Grading method used for Tests and Final Exam (Important)
Tests and exams are graded by assigning points for:

- Correctly identifying the physics of the problem;
- Setting up correctly all the equations and diagrams for the specific physics situation described in the problem, and commenting when necessary or relevant;
- Correctly identifying the all unknown variables to be determined;
- Correctly work out all the necessary symbolic and differential calculus-based operations;
- Correctly work out all the algebraic calculations to determine the solution.

For example:
-If you stick in only numbers to solve a problem with no explanation, you will get 0 points for that problem.
-If you do not work out symbolic computations and vector calculus correctly (e.g. if you equate a vector to a scalar quantity) your equations will be considered incorrect and you will get 0 points for that problem.

D2L (Internet-based utility)
Course information, homework solutions and announcements will be available "D2L".
This on-line course information system is accessible from http://d2l.kennesaw.edu/ .
To sign on, use your KSU Local Area Network (LAN) username and password.
Students are expected to check D2L for announcements at least once or twice a day.

Homework Assignments.
Homework assignments and homework grading will be done through the WebAssign on-line homework tool. Go to The Moodle KSU page has instructions for log in.
Students should use the class key: **kennesaw 5965 5415** in order to see and submit the homework.

Recitations.
Students are expected to attend recitations to practice on the homework (HW) assignments.
Solutions to HW's are posted on D2L **after** the due date of the scheduled assignment.
Attending recitations is critical to be successful in the tests and final exam.
During recitations students can work together (in small groups of 3, or max 4 students) and practice on the HW assignments. I will be in the room to help and answer their questions at any moment.
Students who consistently hand in homework during the semester will get extra credit (although this is not mandatory).

Important dates: withdrawal, last day of class, and final exam.

- First day of classes: *Tuesday, January 7, 2020, 11:45PM*.
- Last day to withdraw without academic penalty: *February 26, 2020*.
- The last day of Class: *Thursday, April 23, 2020*.
- Final exam: *Tuesday, April 28, 2020, 10:30am - 12:30pm.* (Please check this again on the Office of the Registrar website: https://registrar.kennesaw.edu/dates-deadlines/final-exams-sp.php)

The university's withdrawal policy is explained at:
http://registrar.kennesaw.edu/student-records/registration-policy.php
The Academic Standing Appeal policy is explained at:
https://appeals.kennesaw.edu/withdrawal_appeal.php

Students are solely responsible for managing their enrollment status in a class.
Nonattendance does not constitute a withdrawal.

Tentative Schedule

Week 1
Physics and Measurement; Motion in One Dimension
Chapter 1: Sects. 1.1-1.6
Chapter 2: Sects. 2.1-2.8

Week 2
Vectors; Motion in Two Dimensions
Chapter 3: Sects. 3.1-3.4
Chapter 4: Sects. 4.1-4.6

Jan 20 Monday
Holiday - NO CLASSES

Week 3
The Laws of Motion
Chapter 5: Sects. 5.1-5.8

Week 4
Circular motion and Other Applications of Newton's Laws
Chapter 6: Sects. 6.1-6.3
Review;

Jan 28: Test 1

Week 5
Energy of a System
Chapter 7: Sects. 7.1-7.9

Week 6
Conservation of Energy
Chapter 8: Sects. 8.1-8.5

Week 7
Linear Momentum and Collisions
Chapter 9: Sects. 9.1-9.9

Week 8
Rotation of rigid objects
Chapter 10: Sects. 10.1-10.4
Review;

Feb 20: Test 2
February 26, 2020 - Last day to withdraw without academic penalty.

Week 9
Rotation of rigid objects
Chapter 10: Sects. 10.5-10.9

Week 10
Angular momentum; Static equilibrium and Elasticity
Chapter 11: Sects. 11.1-11.4
Chapter 12: Sects. 12.1-12.3

Week 11
Universal Gravitation
Chapter 13: Sects. 13.1-13.6

Week 12
Oscillatory Motion
Chapter 15: Sects. 15.1-15.5
Review;

March 26: Test 3

March 28-April 3 - No classes; Spring break

Week 13
Wave Motion
Chapter 16: Sects. 16.1-16.2, 16.6

Week 14
Relativity
Chapter 38: Sects. 38.1-38.4

Week 15
Relativity
Chapter 38: Sects. 38.5-38.8
Review;

Apr 21: Test 4

Apr 23 - Effective last day of class - Review/Discussion (It is highly recommended to attend!)

Final Exam: Tuesday, *April 28, 2020, 10:30am - 12:30pm.* (Please check this again on the Office of the Registrar website: https://registrar.kennesaw.edu/dates-deadlines/final-exams-sp.php)

Exams/Tests Policy
Four tests will be given in this semester. The test dates are reported on this syllabus. The lowest test grade will be dropped. Please note that the use of any mobile device that transmits a signal is not permitted in any of the exams. ALL mobile devices should be deactivated during exams. You must bring a valid KSU identification card to show upon request at the final exam.

Make-up Exam policy
Make-up exams will not be given. If you know ahead of time you have a conflict, let me know.
If you miss an exam because of an illness (yours of a family member's) or some other unforeseeable event, contact me as soon as you can. You can e-mail me, or call the Physics Dep. Office at 470-570-4205. You must provide documentation showing the reason for missing the exam.
Final make-up exam is ONLY for documented and excused emergencies or for scheduling conflicts with other final exams.

Academic Integrity
Every KSU student is responsible for upholding the provisions of the Student Code of Conduct (http://scai.kennesaw.edu/codes.php), as published in the Undergraduate and Graduate Catalogs. The Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University, which include either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

Attendance & Participation
Students are expected to attend all lectures and recitations, take all tests and exams, and complete all homework assignments.

Students with Disabilities
Any student with a documented disability or medical condition needing academic accommodations of class-related activities or schedules must contact the instructor immediately. Written verification from the KSU Student Disability Services (http://sds.kennesaw.edu/) is required. No requirements exist that accommodations be made prior to completion of this approved University documentation. All discussions will remain confidential.

Other Policies
See the Student Handbook (http://catalog.kennesaw.edu/) for other policies.

Inclement Weather
For the official status of the university check the KSU website http://www.kennesaw.edu