"*The whole of science is nothing more than a refinement of everyday thinking.*"
Albert Einstein, 1936

PHYSICS 1211 – Principles of Physics for Scientists & Engineers I – Spring 2022

Professor Information:

Name: JP Caillault
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Office hours: TuTh 2:00-3:00 pm

Course Information:

Description: This mechanics course is the first of a two semester introductory course in physics for science majors. Please note that basic calculus will be used in this course. Some of the topics covered will be velocity, acceleration, forces, Newton's Laws of motion, conservation laws, rotational physics, gravity, and fluids. The course also includes a laboratory component, PHYS 1211L, which is worth 15% of your course grade. The laboratory is required and no course grade will be assigned until the lab requirement is completed. Please see the lab syllabus for much more information.

Learning Objectives: One of the goals of this course is to have students understand better the role physics plays in everyday life. Another goal of the course is to help students develop their problem solving skills. Both of these goals will be achieved by going through many "real world" example problems in class and by doing many end-of-chapter homework problems.

Textbook: The textbook for the course is *Physics for Scientists and Engineers: A Strategic Approach*, 5th edition, by Randall D. Knight. You can choose to buy a hardcopy version or, if you prefer, an electronic version through the Pearson *MasteringPhysics* website. In addition to the textbook and *MasteringPhysics*, you will need to buy the lab manual (see the lab syllabus for more info regarding the manual). And you should also have a simple scientific calculator that permits work with scientific notation, trig functions and square roots. Programmable calculators and cell phones will not be permitted in class or during examinations.

MasteringPhysics: You must register for *MasteringPhysics*. You can do this by first going to https://www.pearsonmylabandmastering.com/northamerica/masteringphysics/. Once there, you will need to click on the "Student" button on the right-hand side of the page. This will take you to a page where you must enter three pieces of information: (1) your email address, (2) the Course ID (which is caillault61526), and (3) an access code. The access code is something that you *may* obtain when you purchase the textbook. However, if you don't buy access to *MasteringPhysics* when you purchase the textbook, then you can pay for it separately when you register (in step 3 above).

Homework: You will be required to complete all of your homework problems online (these are end-of-chapter problems from your textbook). All of your homework will be submitted through the *MasteringPhysics* website. You are strongly encouraged to try to solve all of the problems on your own. Since your exams will consist almost exclusively of questions and problems like those found in the homework assignments, the importance of the homework cannot be emphasized strongly enough. Also, please note that no late homework will be accepted. The homework due dates are set well in advance, so make sure you plan accordingly. Your overall homework grade will constitute 15% of your course grade.

Exams: There will be three in-class exams, each of which will be worth 15% of your course grade. There will be a cumulative Final Exam that will be worth 25% of your course grade.

Make-Up Exams: There are no make-up exams; if you do not take an exam, you get a zero. However, the grade of your final exam may be used to replace your lowest in-class exam score (in which case the final exam would be worth 40% of your final course grade).

Grades: Your overall numerical grade will be calculated as described above (i.e., the lab is worth 15%, homework is worth 15%, each of the three in-class exams is worth 15%, and the final exam is worth 25%). Your final course *letter grade* will be determined according to the scale shown below.

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\begin{aligned}
&93 \leq \text{A} \\
&90 \leq \text{A}- < 93 \\
&87 \leq \text{B}+ < 90 \\
&83 \leq \text{B}\ \ < 87 \\
&80 \leq \text{B}- < 83 \\
&77 \leq \text{C}+ < 80 \\
&73 \leq \text{C}\ \ < 77 \\
&70 \leq \text{C}- < 73 \\
&60 \leq \text{D}\ \ < 70 \\
&\qquad\ \text{F}\ \ \ < 60
\end{aligned}
$$

Please note that there is no extra credit available and there are no A's for effort – your grade is determined entirely by your performance in the categories listed above.

Academic Honesty: The University's Academic Honesty Policy (A Culture of Honesty) is strictly adhered to. Make sure you know and understand the policy.

Classroom Policies: We want a harmonious and cooperative learning atmosphere in the classroom, so please refrain from behavior that is disturbing to other students. In particular, cellphones, iPads, iPods, and laptops need to be turned off or silenced. Texting, checking email, Facebook, etc. can be distracting to you and those sitting behind you. Devices that use a stylus are permitted for note-taking purposes. (Standard laptops will not be useful for taking notes, since diagrams, equations, and graphs will constitute a large part of the lecture material.) Other examples of disruptive behaviors include arriving late to class or leaving early; packing up books before class is over; dozing in class; noisy eating or drinking; and conducting side conversations. All of these behaviors distract other students and make it difficult for them to maintain their concentration.

Tentative Class Schedule:

Date	Chapter	Topic	MP Homework
Jan. 11	n/a	Introduction	
Jan. 13	1	Concepts of Motion	CQ: 2, 8 E&P: 8, 11, 18, 24, 29, 56
Jan. 18, 20	2	1-D Kinematics	CQ: 6, 14 E&P: 2, 4, 6, 7, 11, 18, 20, 21, 27, 34, 52, 58, 71
Jan. 25	3	Vectors and Coordinate Systems CQ: 1, 2, 9 E&P: 6, 11, 16, 26, 29, 41, 45	
Jan. 27, Feb. 1	4	2-D Kinematics	CQ: 8, 11, 15 E&P: 6, 9, 15, 17, 18, 22, 24, 28, 32, 38, 41, 54, 58, 76

EXAM 1   **Thursday, February 3**   **Chapters 1-4**

Date	Chapter	Topic	MP Homework
Feb. 8, 10	5	Force and Motion	CQ: 4, 6, 14 E&P: 6, 9, 12, 24, 26, 34, 39, 47
Feb. 15, 17	6	Motion Along a Line	CQ: 1, 9, 12, 13, 16 E&P: 2, 3, 11, 12, 18, 21, 31, 32, 38, 42, 56, 58
Feb. 22	7	Newton's Third Law	CQ: 5, 6, 13, 15 E&P: 8, 11, 18, 23, 32, 34, 37, 40
Feb. 24, Mar. 1	8	Motion in a Plane	CQ: 1, 3, 5, 10 E&P: 2, 10, 12, 16, 19, 26, 30, 41, 49, 59

EXAM 2   **Thursday, March 3**   **Chapters 5-8**

Tentative Class Schedule:

Date	Chapter	Topic	MP Homework
Mar. 15, 17	9	Work and Kinetic Energy	CQ: 2, 4, 5, 8, 11 E&P: 4, 10, 12, 19, 22, 25, 30, 35, 39, 42, 47, 54
Mar. 22, 24	10	Interactions and Potential Energy	CQ: 3, 5, 8, 12 E&P: 4, 14, 19, 22, 26, 30, 32, 35, 38, 40, 45, 51, 62
Mar. 29, 31, Apr. 5	11	Impulse and Momentum	CQ: 2, 6, 10, 12 E&P: 4, 6, 10, 13, 15, 16, 18, 23, 25, 26, 32, 39, 59, 73

EXAM 3   **Thursday, April 7**   **Chapters 9-11**

Date	Chapter	Topic	MP Homework
Apr. 12, 14, 19	12	Rotation of a Rigid Body	CQ: 2, 3, 8, 10, 11, 13 E&P: 2, 4, 6, 7, 12, 14, 17, 21, 22, 24, 28, 32, 35, 36, 40, 42, 44, 45, 57, 62
Apr. 21, 26	13	Gravity	CQ: 2, 3, 5, 9, 10 E&P: 2, 6, 10, 13, 15, 18, 28, 34, 41, 45, 47, 52
Apr. 28, May 3	14	Fluids	CQ: 2, 3, 4, 6, 7, 9, 10, 11 E&P: 2, 3, 9, 11, 14, 21, 23, 25, 28, 40, 51, 59

FINAL   **Monday, May 9**   **Chapters 1-14**
                     (7 – 10 pm)