

COURSE INFORMATION

Physics 2210 – Spring 2023

Classical Physics I

Lecture: Tu Th 4:00–5:15 pm DDH 104K
Lab Sections: Mo We 4:00–6:30 pm Th 10:00 am–12:30 pm SCI II 285

Instructor for Lectures and Lab sections:

Dr. Alexander Dzyubenko adzyubenko@csub.edu SCI III Room 302

Office Hours: Mo We 1:50–3:50 pm, Tu 2:30–3:30 pm and by appointment

Text: *Physics for Scientists and Engineers* 10th Edition by R.A. Serway and J.W. Jewett
ISBN-13: 978-1337553278, ISBN-10: 1337553271

Goals of this course: Very generally, we will try to address the following goals:

1. To acquire rather detailed qualitative understanding of *classical mechanics* and its basic notions and concepts. We will extensively discuss such physical notions and quantities as *velocity* and *acceleration*, *mass*, *inertia* and *moment of inertia*, *forces*, *linear* and *rotational motions*, *Newton's laws of motion*, and *mechanical work* and *energy*. An emphasis on their interrelations will be made.

2. We will be using math extensively for a description of the physical world. The main goals here are to develop *mathematical skills*, *analytical methods* and *effective problem solving skills*. A strong emphasis on using the powerful machinery of calculus will be made.

3. To enhance communication skills appropriate to physics.

A rough schedule appears below. Lectures will cover only selected topics from the text but you will be responsible for all corresponding text material unless specifically told otherwise.

MECHANICS (Ch 1-11)

Part I: Chapters 1–5

Week 1 – 6

Ch 1. Physics and Measurement

- Standards of Length, Mass, and Time
- Dimensional Analysis
- Estimates and Order-of-Magnitudes
- Conversion of Units

Ch 2. Motion in One Dimension

- Position, Velocity, Speed, Acceleration
- Motion Diagrams
- Freely Falling Objects

Ch 3. Vectors

- Vectors and Scalars
- Components of Vectors and Unit Vectors

Ch 4. Motion in Two Dimensions

- Projectile Motion
- Circular Motion
- Tangential and Radial Acceleration

Ch 5. The Laws of Motion

- The Concept of Force
- Newton's Laws of Motion and their applications

Part II: Chapters 6–9**Week 7 – 13****Ch 6. Circular Motion and Other Applications of Newton's Laws**

- Second Newton's Law Applied to Circular Motion
- Motion in the Presence of Resistive Force

Ch 7. Energy of a System

- Work Done by Constant and Varying Forces
- Work-Energy Theorem

Ch 8. Conservation of Energy

- Conservative and Non-Conservative Forces
- Changes in Mechanical Energy

Ch 9. Linear Momentum and Collisions

- Impulse and Momentum

Week 12 Apr 10-Apr 17 Spring Break

- The Center of Mass
- Rocket Propulsion

Part III: Chapters 10–11:**Week 14 – 16****Ch 10. Rotation of a Rigid Object**

- Angular and Linear Quantities
- Moment of Inertia and Torque
- Rotational Kinetic Energy

Ch 11. Angular Momentum

- The Product and Torque
- Conservation of Angular Momentum

Exams

First Exam:	Chapters 1-5	Thursday,	March 2	tentative
Second Exam:	Chapters 6-9	Thursday,	April 14	tentative
Final Exam:	Cumulative	Tuesday,	May 16	5:00 PM – 7:30 PM

Dates to remember:

February 17: Last day to withdraw without a "W" being recorded
 April 17: Last Day to Withdraw from Classes for a Serious and Compelling Reason.
 May 12: Last day of classes

Laboratories

Lab handouts will be posted on the Canvas of the course. The students do the exercises following the instruction, write a lab report and upload (as a pdf file, strongly preferred) to the Canvas. The due date for the reports will be given during the class meetings. The use of a word processor and (if applicable) a graphing program is required.

Dates	Lab Title (Tentative)
Week 1 Jan 23 – Jan 27	No Lab meetings
Week 2 Jan 30 – Feb 3	Lab 1: Instantaneous vs Average Velocity
Week 3 Feb 6 – Feb 10	Quiz 1
Week 4 Feb 13 – Feb 17	Lab 2: Projectile motion
Week 5 Feb 20 – Feb 24	Quiz 2
Week 6 Feb 27 – Mar 3	Lecture time: Thursday Mar 2 Exam I
Week 7 Mar 6 – Mar 10	Lab 3: Force of Friction
Week 8 Mar 13 – Mar 17	Quiz 3
Week 9 Mar 20 – Mar 24	Lab 4: Pendulum
Week 10 Mar 27 – Mar 29	Quiz 4
Week 11 April 2 – 9 Spring Break	
Week 12 Apr 10 – Apr 14	Lecture time: Thursday April 14 Exam II
Week 13 Apr 17 – Apr 21	Lab 5: Gravity and Orbits
Week 14 Apr 24 – Apr 28	Quiz 5
Week 15 May 1 – May 5	Lab 6: Springs Lab
Week 16 May 8 – May 12	Problem Solving Session

Quizzes

A quiz will be given once every other week during the Lab time and will consist of a series of multiple choice questions which will make sure that you keep up with the lecture, lab, and problem sets. Please find tentative **Quiz dates** above.

Exams

The most important determinant of your grade is exam performance. There will be **two midterm exams** (tentative dates: March 2 and April 14) and the **cumulative final exam** (May 16). The exams will consist of multiple-choice problems.

If you must miss an exam, do have a legitimate and documented reason and inform me before the scheduled exam time. I do not give make-up exams or quizzes.

Homework Problems

Problem solving is the key to mastering physics. In fact, if you master all of the assigned questions and problems, you will do very well in the course.

On a regular basis, I will assign some representative problems. These will be **Canvas assignments**, further details will be given later.

Some but *not most* of these questions will be discussed in detail in problem solving sessions before the exams. I encourage you to be proactive in class discussions.

Grade Distribution

Three Exams	60%
Quizzes	20%
Homework:	10%
Labs	10%

About grade assignments. Ultimately, the final grade I assign to you is my judgment of your performance (and only your performance). Inevitably, this judgment contains some subjective component, regardless of how objective I try to be. At the end of the course I will discuss only the bookkeeping related to a person's grade, but not my assignment of a letter grade. For example, if a student's final score is 79%, I will review at student's request how I arrived at that number, but I WILL NOT argue with the student why I think that should be a letter grade as opposed to some other letter grade. I will be the judge – NOT THE STUDENT – of what 79% means in the context of the class. Also, any inquiries regarding grades must be made by email.

Accommodations for Students with Disabilities:

To request academic accommodations due to a disability, please contact the Office of Services for Students with Disabilities (SSD) as soon as possible. Their office is located in SA 140, and they may be reached at 661-654-3360 (voice), or 661-654-6288 (TDD). If you have an accommodations letter from the SSD Office documenting that you have a disability, please present the letter to me during my office hours as soon as possible so we can discuss the specific accommodations that you might need in this class.

For more information, please refer to:

<https://www.csub.edu/ssd>

Academic Integrity:

Anyone found to be cheating will automatically get an F in the course.

“There are certain forms of conduct that violate the university's policy of academic integrity. Academic dishonesty (cheating) is a broad category of actions that involve fraud and deception to improve a grade or obtain course credit. Academic dishonesty (cheating) is not limited to examination situations alone, but arises whenever students attempt to gain an unearned academic advantage. Plagiarism is a specific form of academic dishonesty (cheating) which consists of the misuse of published or unpublished works of another by claiming them as one's own. Plagiarism may consist of handing in someone else's work as one's own, copying or purchasing a pre-written composition and claiming it as one's own, using paragraphs, sentences, phrases, words or ideas written by another without giving appropriate citation, or using data and/or statistics compiled by another without giving appropriate citation. Another example of academic dishonesty (cheating) is the submission of the same, or essentially the same paper or other assignment for credit in two different courses without receiving prior approval from the instructors of the affected courses.”

Source: 2018-2020 CSUB Catalog, p.82.

For more information, please refer to:

<https://www.csub.edu/osrr/Academic%20Integrity%20index.html>

Policies:

You are expected to attend every class, to be on-time, and to maintain a respectful and professional atmosphere during online class meetings.

By staying in the class, the student agrees to the terms in this syllabus.