Syllabus for Physics 120 – General Physics I Spring 2026

- **Instructor:** Antonio Cancio
  - office: CS 439
  - office hours: M 1:00 PM, Tu 3 PM, W 10 AM, Th 10 AM, TBD
  - phone: 285-8868
  - email: accancio@bsu.edu (I will reply within 24 hours)
- **Textbook:** Serway/Jewett - Physics for Scientists and Engineers, 11th edition, Cengage. ISBN 13 : 978-8214193152.

  Lab Manual, distributed online via Canvas.
- **Prerequisites:** Working knowledge of basic algebra and trigonometry. Concurrently taking Calculus I, Math 165. A calculator with basic trigonometric functions, powers and roots will be useful for doing assignments and for lab.
- **Purpose:** This class is intended as the calculus-based introduction to physics for science majors. We focus on the fundamental physical principles that underly the motion of macroscopic bodies. These principles will allow us to understand a wide variety of phenomena, including the physics of everyday objects, the orbits of planets and the nature of waves and sound. An important goal of the class is to introduce you not only to the content of physical law but to the language and culture of doing physics, of learning how to find things out for yourself. This will give you the opportunity to develop and sharpen analytical problem solving skills that will be of use in many other fields.
- **Objectives:** By successful completion of this course, students in PHYC 120 will be able to:
  - Identify and use the basic laws of physics to analyze everyday physical phenomena, either by conceptual reasoning or by quantitative calculation.
  - Use mathematial techniques of differential and integral calculus, trigonometry, algebra to derive analytical expressions to describe physical phenomena. This calculus-based physics course will challenge students with prior mathematical skills and interests beyond the High School physics experience.
  - Identify the basic fundamentals of precise scientific communication, explain how to present the solution of a mathematical analysis of a physical problem, and how to present formal written reports summarizing experimental work.
  - Demonstrate competence in problem solving techniques used science and engineering. One of the most important aspects of the introductory physics course is to provide students with extensive experiences in analyzing problems and synthesizing solutions.

  - Recognize and explain scientific methods of observation and recording of data. This will be accomplished in the laboratory portion of the course. To gain confidence in their ability to compute reliable answers in the laboratory are additional objectives associated with the laboratory component of the course.

- **Course Structure:** Classes will meet for two one-hour lectures and two two-hour labs per week. Regular class sessions will involve frequent student discussions as well as lectures. There will be weekly homework assignments and frequent quizzes and assignments, three hour exams and a final.

- **Laboratory:** Laboratory provides you with the opportunity to *do* physics – to see for yourself how relationships derived in the classroom apply to the real world – and thus is a key opportunity for you to really learn the subject. As such, you will be required to perform **all** the experiments. If you must miss a lab session, a make-up session will be held on the last week of class. You will be allowed **one** lab make up. For some activities, you will not be asked to write a formal lab report, but rather complete a template that will serve as your lab instructions as well. Otherwise you will be writing a lab report that will be due at the start of the next lab session. There will be a 25% deduction per day for late reports. urther details will be given in your lab session.

- **Assignments:** Problem solving – working things out for yourself either in the lab or with pen and paper – is at the heart of learning physics. Doing the problems carefully is also an excellent preparation for the hour exams and final. You will be given weekly home-work assignments, which will cover the material being discussed that week. Some assignments may be online using the WebAssign system, others will be written. Written assignments are normally due at the beginning of class on the day due unless otherwise specified, and should be uploaded to Canvas in PDF format. Late assignments will be penalized by 25% to 50%. **Assignments more than two class periods late will get a grade of 0.** Several short quizzes will be given during the semester covering the same material as the homework to help you gauge your progress in this area.

- **Reading:** Reading the textbook is an important part of the course. Reading the appropriate section of the text before class is important for participating intelligently in class and learning from it. Pop quizzes may occasionally be given to test your reading.

- **Examinations:** Quizzes will be given throughout the semester, including announced quizzes that will reflect that weeks homework assignment, and unannounced quizzes to test your preparation for class. These will either be in class or online, announced during class. **No makeups for quizzes will be given** – your two lowest quiz grades will be dropped to allow for the occasional missed quiz or bad day. **If you have to quarantine, the option to take a quiz online will be provided.**

Three one-hour exams will be given. Exam questions will be drawn from the topics discussed since the last exam; however many subjects in physics build upon other more fundamental ones, and it is generally a good rule to review material previously covered. The final exam will cover the entire course. While we are still meeting in person, hour exams will be during class time; however, as needed, exams will be moved online.

Make up exams will be given only for circumstances deemed valid by the instructor. Please give notice that you will miss an exam as soon as possible, preferably **before** the exam. The makeup exam will be different from the one taken by the rest of the class.

- **Grading:** Final grades will be determined using the following weighting:

Quizzes and homework:	20%
Laboratory:	20%
Hour exams:	14% each
Final exam:	18%

Numerical grades correspond to letter grades as follows:

90.0-100:	A	86.7-90.0:	A^-	83.3-86.7:	B^+
80.0-83.3:	B	76.7-80.0:	B^-	73.3-76.7:	C^+
70.0-73.3:	C	66.7-70.0:	C^-	56.7-66.7:	D
0.0-56.7:	F				

Exams will be graded on a curve.

- **Attendance** in class is not required, but is expected. Regular attendance in class, participation in class discussions and activities, completion of assignments will be considered in assignment of final grades. Laptops, smart-phones and other electronic devices may be used in class only **at the discretion of the instructor.**

- Cheating or other forms of **Academic Honesty** is prohibited at Ball State University. Although you are encouraged to work together on labs and other assignments your final report or homework must be your own. Copying other peoples work or using AI without attribution is not permitted and may be subject to disciplinary measures.

- All work conducted and/or submitted in this course must be your own, completed in accordance with the Ball State University's Student Academic Ethics Policy. You may not normally collaborate with or make use of ChatGPT or any other **generative AI** applications to develop materials submitted in this course. Exceptions will be made on a case-by-case basis, and guidelines will be given for attribution. Trivial AI tools like autocomplete features in an editor are allowed.

- **Help!** You are encouraged to see me for help during my office hours or by making an appointment. I can also meet by Zoom if the circumstances warrant. Tutoring on physics problems may be made available via a Physics Study Room, details TBA.

Also, the Learning Center offers tutoring for physics classes, including Phyc 120. Call 765-285-3780 or visit NQ 350 to make an appointment to meet with a tutor.

- **University Policies**

  We are committed to ensuring that all **members of the community are welcome**, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse.

  In this course, we are committed to fostering a learning environment that values **intellectual diversity**, encourages free expression, and promotes open inquiry. As members of the Ball State Community, we treat each person in the Ball State community with civility, courtesy, compassion, and dignity and respect and learn from differences in people, ideas, and opinions. Please review Ball State University's Statement on Freedom of Expression, the resources on Ball State's Freedom of Expression webpage, and Ball State's Beneficence Pledge.

  If you need course **adaptations or accommodations** because of a disability, or if you have emergency medical information to share with me, please contact me as soon as possible. Ball State's Disability Services Office coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability Services can be contacted at 765-285-5293 or dsd@bsu.edu.

- **Disclaimer:** This syllabus is subject to change in the event of extenuating circumstances.

Syllabus for Physics 120 – General Physics I **Spring 2026**
Tentative! Schedule of Reading and Laboratory

Week of	**Reading**	**Topics**	Labs
Jan 5	Chap 1	Review of basics	Measurement, Uncertainty and Error
Jan 12	Chap 2	Motion in 1 dimension	1-D motion Video Analysis
Jan 19	Chap 2,3	Freefall/Vectors	The Falling Mass
Jan 26	Chap 3,4	Vectors/Projectiles	2D motion or Vectors
Feb 2	Chap 5	Newton's Laws	Forces in Equilibrium
		Hour Exam I, Feb 2 (Chaps 1 – 4)	
Feb 9	Chap 5	Force and motion	Atwood's Machine
Feb 16	Chap 5,6	Friction/Circular motion	Friction Inquiry
Feb 23	Chap 7	Work and Energy	Midterm Exam
Mar 2	NA	**Spring Break**	NA
		Hour Exam II, Feb 26, (Chaps 4 – 7)	
Mar 9	Chap 8,9	Energy Conservation	Conservation of Energy
Mar 16	Chap 9,10	Momentum and Collisions	Ballistic Pendulum
Mar 23	Chap 10,12	Torque and Rotational Motion	1D Collisions
Mar 30	Chap 11,13	Angular Momentum/Orbits	Rotational Motion and Kinetic Energy
		Exam III, Mar 30 (Chaps 8 – 13)	
Apr 6	Chap 14	Fluids	Archimedes Principle
Apr 13	Chap 15	Oscillatory Motion	Simple Harmonic Motion
Apr 20	Chap 16,17	Waves and Sound	Waves and Sound
Apr 27	–	Review	
		Final Exam, comprehensive, noon Wednesday, Apr 30.	

Class will not be held Monday Jan 20.