Physics 170: Introductory and Modern Physics
Spring 2023, On-line
Asynchronous

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Please note:

- All e-mail communication from the instructor concerning this course will be to GMU accounts only.
- If you are a student with a disability and you need academic accommodations, please see me **and** contact the Office of Disability Resources at 703.993.2474. All academic accommodations must be arranged through that office.

Course Goal:

1. Introduce basic physics concepts and techniques

   This is a first course in a calculus-based, introductory physics sequence. The most important thing you will learn is how to solve word problems: understanding what is being asked, estimating an answer, conceptualizing and undertaking a systematic approach toward a solution, checking results and modifying, if necessary, your understanding and/or approach. The physical models you will be exposed to are those of contemporary physics, including special relativity and quantum mechanics.

2. Understand the nature of science

   This is a GMU natural science with laboratory general education course. General education natural sciences courses engage students in scientific exploration; foster their curiosity; enhance their enthusiasm for science; and enable them to apply scientific knowledge and reasoning to personal, professional, and public decision-making.

   To achieve these goals, students will:

   (a) understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:

      i. evolves based on new evidence

ii. differs from personal and cultural beliefs

(b) Recognize the scope and limits of science.

(c) Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.)

(d) Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information)

(e) Participate in scientific inquiry and communicate the elements of the process, including:

i. Making careful and systematic observations

ii. Developing and testing a hypothesis

iii. Analyzing evidence

iv. Interpreting results

Texts: None required. Assigments include readings and embedded problems. Any introductory physics textbook may be referred to for additional insight.

Expectations:

Students are expected to complete assigned exercises in advance of weekly individual or small group tutorial sessions at which students present their solutions to the exercises. Working with others to get started or overcome difficulties is encouraged, but the solutions presented must be the work of the presenting student. Shared or copied solutions will earn no credit for all involved.

Timely attendance at tutorial sessions account for 50% of the final grade. The quantity of problems attempted and the quality of the solutions presented account for an additional quarter of the final grade. Another 10% of the final grade can be earned by submitting corrected solutions (this 10% is automatically granted when all presented solutions are correct).

Of the remaining 15% of the final grade, 10% will be assigned on the basis of an end-of-semester, one-on-one meeting with each student to go over the work of the semester (an oral final exam), and 5% will depend on the completion of pretests and posttests.

Grading:

- Preparation for weekly meetings, 75%
- Reworked problems 10%
- Final one-on-one meeting 10%
- Completion of pretests and posttests 5%

A+ = 100-93.33%	A = 93.32-86.67	A- = 86.66-80
B+ = 79.99-73.33	B = 73.32-66.67	B- = 66.66-60
C+ = 59.99-53.33	C = 53.32-46.67	C- = 46.66-40
	D = 39.99-20	
	F < 20	

Tentative Schedule:

Week of	Topic
23 Jan	Introduction
30 Jan	Structure of Physics
06 Feb	Structure of Physics
13 Feb	Thermodynamics
20 Feb	Thermodynamics
27 Feb	Thermodynamics
06 Mar	Motion
13 Mar	Spring Break: No meetings
20 Mar	Motion
27 Mar	Motion
03 Apr	Motion
10 Apr	Motion
17 Apr	Motion
24 Apr	Motion
01 May	Motion

Attendance and Tardiness: Preparation for and on-time attendance at weekly sessions are required. Half the credit for session attendance will be deducted for tardiness. Up to all the presentation credit will be deducted for lack of preparation. No credit will be given for a missed session (14 sessions and weekly reworked problems amount to 85% of the grade; each missed session therefore costs about 6% of the final grade).

Disruptive Behavior: Constructive engagement at weekly sessions, prepared to offer and explain solutions to the exercises assigned, is expected.

Honor Code Violations: The work you present must be your own. Plagiarism and cheating will be punished with failing grades and trial by the honor committee. It's important to appreciate that science is impossible when dishonesty, in any manifestation, exists.

The GMU Honor Code: `https://oai.gmu.edu/mason-honor-code/`