Physics 170: Introductory and Modern Physics
Spring 2022, 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 will include readings and embedded problems. Any introductory physics textbook may be referred to for additional insight.

Expectations:

Students are expected to complete assigned readings and problems in advance of weekly (two-hour) meetings. Working with others to get started or overcome difficulties is encouraged, but not required. The weekly meetings will be conducted in a tutorial style, in which students take turns presenting their results. Preparation for these weekly meetings account for 60% of the final grade. Additional hours are available to stdents at their request to help prepare for or review what happened at the weekly meetings Minimual session time will be spent discussing concepts. On the basis of what happens at the weekly meetings, a reworking of a problem that the student may have not gotten fully correct will be assigned. Submission of these redone problems account for an additional 25% of the final grade.

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

Grading:

- Preparation for weekly meetings, 60%; reworked problems 25%, final one-on-one meeting 10%, completion of 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
24 Jan	Introduction
31 Jan	Structure of Physics
07 Feb	Thermodynamics
14 Feb	Thermodynamics
21 Feb	Thermodynamics
28 Feb	Motion
07 Mar	Motion
14 Mar	Spring Break: No meetings
21 Mar	Motion
28 Mar	Motion
04 Apr	Motion
11 Apr	Motion
18 Apr	Motion
25 Apr	Motion
02 May	Motion

Attendance and Tardiness: Preparation for and on-time attendance at weekly sessions are required. One-third of the credit for a session will be deducted for tardiness. Two-thirds will be deducted for lack of preparation. All credit will be lost if a session is missed.

Disruptive Behavior: It is expected that you will engage constructively at the weekly session, prepared to offer and explain solutions to the exercises assigned.

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/`