

PHY 190: Physics & Engineering Colloquium Fall 2025

Instructor: Dr. Truong Le
Office: Trexler 172E
Email: tle@roanoke.edu

Lecture Room: Trexler Hall, 273
Lecture Time: W 2:20-3:50 pm
Office Hours: MW (10-12 pm), and by appointment

Course Description: An on-going discussion of the differences between physics, engineering, and other sciences, all within the context of problem-solving, disciplinary content, the scientific process, the role and boundaries of science, new discovery and cutting-edge technology, and historical biography.

Textbook: “Get Ready for Physics”, Edward Adelson, 1st edition (on Inquire).

Specific Goals of the Course: Students will begin to

- prepare for further study of physics, engineering, or astronomy through review of math concepts such as algebra, trigonometry, exponentials and logarithms, and rates of change
- explore areas of physics such as optics, mechanics, electricity, and thermal phenomena
- do some self-examination to identify your own learning style and most effective study techniques, and which area of STEM you would like to pursue
- meet a group of peers also interested in physics and engineering

Team Collaborations: Group of four students will be arranged to develop problem-solving skills/strategies.

Pass or Fail: To determine if you pass the class, I will calculate your grade according to this scale:

A	93% or more	A-	90-92.9%	B+	87-89.9%	B	83-86.9%	B	80-82.9%
C+	77-79.9%	C	73-76.9%	C-	70-72.9%	D	60-69.9%	F	below 60%

Feedback and Evaluation: This course is graded Pass/Fail. Any grade of a D- or above will be considered as passing. These are the categories and percentages that will be used:

Preparation 20% **Participation 25%** **Homework 25%** **Project 30%**

- **Preparation** will involve my judgement of your having done the reading and the accompanying reflection questions or practice exercises before our class meeting.
- **Participation** will reflect your involvement during class discussions, exercises, and activities.
- **Homework** will consist of exercises based on the reading and the skills being developed. It will be due on Tuesday at 11:59 pm.
- **Project** will include three brief out-of-class assignments: **(1) Major Exploration (group)** - research your intended Roanoke major and explain why it fits you. **(2) 4-Year Course Plan (group)** - create a semester-by-semester schedule with prerequisites, labs, math, and physics/engineering sequence to graduate on time. **(3) Research Readiness (individual)** - choose a research area and outline the key concepts, methods, tools, and steps to get involved.
- **Note:** You should expect to spend a total of about 6 hours per week on this course.

Policy on Late Work: Unless you notify me beforehand with a valid excuse, late homework will undergo a 10% deduction per school day that it is not submitted (school days are Monday through Friday). Work submitted after the midnight before of class will be considered one day late.

Academic Integrity: Your learning and integrity are at the core of your RC education. For this reason, you must follow the College's Academic Integrity policies: you can find the policies and resources online at https://www.roanoke.edu/inside/academic_affairs/academic_integrity (← clickable link).

Homework problems may be discussed with others, and you must formulate your solution on your own. If I become aware of a possible violation of these guidelines, I am contractually obligated to report it to the Academic Integrity committee.

Accessible Education Services (AES): This is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Dustin Persinger, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Dustin Persinger at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

PHYS 190 CLASS OUTLINE :

#	Date	Topic	GRFP reading
1	Aug. 27	no class	
2	Sep. 3	Welcome to the course!	
3	Sep. 10	Learning styles and goals	Pages 1-29
4	Sep. 17	Wow Physics! - Research in astrophysics (Dr. Le - 3:30 pm)	Pages 30-55
5	Sep. 24	- Orders of magnitude - conversions, estimates, dimensions - Research in mechanical engineering (Dr. Vuddanam)	Pages 57-67
6	Oct. 1	- Engineering and Physics - Algebra and operations - Research in engineering (Dr. Cobb - 3:30 pm)	Pages 68-79
7	Oct. 8	- Experimentation - measurement - How to 3-D print (Bonnie Price - 3:30 pm)	Pages 80-90
	Oct. 15	- Fall Break	
8	Oct. 22	- Ray Optics I - geometry/trigonometry - Research in material physics (Dr. Fatima - 3:00 pm)	Pages 90-100
9	Oct. 29	- Ray optics 2 - and exponentials and logarithms - Research in electrical engineering (Dr. Sarker)	Pages 101-110
10	Nov. 5	- Mechanics/fluids - rates of change - Research in experimental physics (Dr. Grant - 3:30 pm)	Pages 114-130
11	Nov. 12	- Modeling exercise - work and energy - Student Research in physics/astronomy (TBD)	Pages 131-142
12	Nov. 19	- Electricity and Magnetism - uncertainty - Research in biophysics (Dr. Robb)	Pages 144-166
13	Dec. 3	- Thermal Physics/Oscillations - wave motion - Your Research Plan Presentation	Pages 167-186

I have read and understood this syllabus. Sign, date, and submit this page on Inquire for 10 points toward your participation grade.

Student's Name (First and Last)

Date