

# Physics 190 Physics & Engineering Colloquium Fall 2020

Instructor: Daniel Robb                      Class Times: Th 2:50-4:50 (Trexler 374)  
Office:        Massengill 243                      Office Hrs: T 9-11, W 3-4, via Zoom:  
Email:        robb@roanoke.edu                Meeting ID 483 818 7781, Passcode 2583  
Phone:        375-5250

## 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, ISBN-13 978-0321556257

## Specific Goals of the Course:

1. to prepare for further study of physics or engineering through review of math concepts such as algebra, trigonometry, exponentials and logarithms, and rates of change
2. to begin to explore areas of physics such as optics, mechanics, electricity, and thermal phenomena
3. to 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
4. to meet a group of peers also interested in physics and engineering

## Feedback and Evaluation:

This course is graded "Pass"/"Fail". To determine if you pass the class, I will calculate your grade according to the normal ranges of "A" for 93-100, an "A-" for 90-93, a "B+" for 87-90, a "B" for 83-87, etc. 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:                    40%  
Homework:                        40%

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 by the start of the following class.

### 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 start of class will be considered one day late.

### Academic Integrity:

I will follow the college Academic Integrity policies. Homework problems may be discussed with others, but you should not take the entire solution process from another person, and you must formulate your solution on your own. Be aware that I am contractually obligated to report students if I suspect that they have engaged in academic dishonesty. Lastly, unless otherwise directed, cell phones should be silenced and out of sight during all class periods.

### Technology challenges:

You will need internet connectivity. If you have technology challenges, I need you to email me so that we can discuss how you can keep up.

### Accessible Education Services (AES):

(AES) 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 Laura Leonard, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at [aes@roanoke.edu](mailto: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 Laura Leonard at your earliest convenience to schedule an appointment. If you are on record with AES as having academic or physical needs requiring accommodations, please contact me as soon as possible. We need to discuss your accommodations before they can be implemented.

### Attendance Policy:

If you have a temperature of 100.4 or higher or other coronavirus symptoms, call Health Services IMMEDIATELY if living on campus, or call your family doctor if living at home. Do keep up with all readings, assignments, and deadlines. If Health Services or your doctor informs you that you should isolate for multiple days or weeks, given that the class is online, you may still attend class, or watch cloud recordings of the classes if you prefer. All absences caused by consultation with Health Services or your family doctor about coronavirus symptoms or isolation will be excused.

The following is the course policy for all other absences. You are expected to attend every online class. Attendance is checked after each class meeting, and you must be in class to participate in the in-class activities which form part of the class participation grade. If you are going to be absent from class for a valid (excused) reason, I must be notified in advance. Your fourth and each additional unexcused absence will result in a 2point deduction in your final course grade. Furthermore, you are accountable for all work missed because of any absence.

### Face Covering Policy:

Face coverings/masks must be worn over the mouth and nose by all students and instructors in classrooms and hallways of academic buildings. By wearing face coverings, we protect our college community and its most vulnerable members.

PHYS 190 CLASS OUTLINE

<u>#</u>	<u>Date</u>	<u>Topic</u>	<u>GRFP reading to prepare</u>
1	Aug. 20	Welcome to the course!	
2	27	Learning styles and goals	Pages 1-29
3	Sept. 3	Wow Physics!	Pages 30-55
4	10	Orders of magnitude (Conversions, estimates, dimensions)	Pages 57-67
5	17	Engineering and Physics (Algebra and operations)	Pages 68-79
6	24	Experimentation: Logger Pro (measurement)	Pages 80-90
7	Oct. 1	Ray Optics I (geometry/trigonometry)	Pages 90-100
8	8	Ray optics 2 (and exponentials and logarithms)	Pages 101-110
9	15	Mechanics/fluids (rates of change)	Pages 114-130
10	22	Modeling exercise (work and energy)	Pages 131-142
11	29	Electricity and Magnetism (uncertainty)	Pages 144-166
12	Nov. 5	Thermal Physics/Oscillations (wave motion)	Pages 167-186

13	12	Resonance Tubes (graphical interpretation)	
----	----	---	--

Note: You should expect to spend a total of about 6 hours per week on this course.