

Physics 190 Physics & Engineering Colloquium Fall 2021

Instructor: Daniel Robb Class Times: T 11:50-1:00 (Massengill Auditorium)
Office: Massengill 243 Office Hrs: T/Th 1:00-3:00 (15 min Zoom appts)
Email: robb@roanoke.edu (Make appts at calendly.com/daniel_robb)
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:

<u>Preparation:</u>	20%
<u>Participation:</u>	40%
<u>Homework:</u>	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.

Accessible Education Services (AES):

Accessible Education Services (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 Becky Harman, 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 Becky Harman at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Attendance Policy:

If you have a temperature of 100.4 or higher or other coronavirus symptoms, don't come to class. Call Health Services IMMEDIATELY. Do not come to class or go to any public area on campus. Do keep up with all readings, assignments, and deadlines. In order for your absence to be excused, you must give Health Services permission to notify me that you have consulted them about coronavirus symptoms. If Health Services informs you that you should isolate and not attend class for multiple days or weeks, please contact me so that we can formulate a plan to keep you current in the course. All absences caused by consultation with Health Services about coronavirus symptoms or isolation ordered by Health Services will be excused.

The following is the course policy for all other absences. You are expected to attend every class. Attendance is checked at 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 third and each additional unexcused absence will result in a 2-point deduction in your final course grade. Furthermore, you are accountable for all work missed because of any absence.

Mask Policy

The College has issued a mask mandate for the start of the semester that requires masks to be worn in indoor common spaces such as our classroom. You must wear a mask in this class. If you arrive without a mask, you will not be allowed to stay and may lose credit for attendance or in-class work. The Bookstore sells masks if you need to make a quick purchase. If the mandate is extended, you will be required to continue to wear a mask.

PHYS 190 CLASS OUTLINE

<u>#</u>	<u>Date</u>	<u>Topic</u>	<u>GRFP reading to prepare</u>
1	Sept. 7	No class	
2	Sept. 14	Welcome to the course!	
3	Sept. 21	Learning styles and goals	Pages 1-29
4	Sept. 28	Wow Physics!	Pages 30-55
5	Oct. 5	Orders of magnitude (Conversions, estimates, dimensions)	Pages 57-67
6	Oct. 12	Engineering and Physics (Algebra and operations) Meet Dana Hargrove	Pages 68-79
7	Oct. 26	Experimentation: Logger Pro (measurement) Meet Bonnie Price	Pages 80-90
8	Nov. 2	Ray Optics I (geometry/trigonometry)	Pages 90-100
9	Nov. 9	Ray optics 2 (and exponentials and logarithms)	Pages 101-110
10	Nov. 16	Mechanics/fluids (rates of change)	Pages 114-130
11	Nov. 23	Modeling exercise (work and energy) Meet Daniel Hickox-Young	Pages 131-142
12	Nov. 30	Electricity and Magnetism (uncertainty)	Pages 144-166
13	Dec. 7	Thermal Physics/Oscillations (wave motion)	Pages 167-186

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