Physics 201 **Dr. Edward J. Brash**
Spring 2022 edward.brash@cnu.edu
Office: Luter 304, or online **594-7451**
Office Hours: MW 2:30-3:30pm, Fri 11:00-noon, or by appointment - online on Google Meet

GENERAL PHYSICS

Text: OpenStax University Physics – Volume I – http://www.openstax.org

This textbook is freely available online, and there is a print version available on Amazon that is quite reasonably priced. There is also an OpenStax app for your phone or tablet that I highly recommend. The homework problems will be from this book as well.

Course Learning Objectives:

Upon completion of PHYS-201, a student should be able to:

1) identify and apply appropriate models, laws and equations to physical problems involving forces and motion.
2) differentiate between scalar and vector quantities.
3) apply free body diagrams and unit vector notation to solve problems involving vectors in translational and rotational kinematics and dynamics.
4) solve problems in mechanics using conserved quantities.

Physics Topics: Units, conversion, and problem solving. Kinematics (position, velocity, acceleration). Circular motion. Forces and Newton's laws. Work, kinetic energy, and potential energy. Linear momentum and collisions. Rotational kinematics and dynamics.

Homework: Assignments will be given each week and will be due the following week. Homework will not be turned in but will instead be submitted via the WebAssign web portal.

TO RECEIVE HOMEWORK CREDIT, YOU MUST SUBMIT YOUR ANSWERS VIA THE WEBASSIGN PORTAL.

Exams: Two hourly exams and a comprehensive final. See schedule below.

Grading:

Homework	25%	
Each hourly exam	20% x 2 = 40%	
Final exam	35%	

Homework is due by MIDNIGHT on the due date. If you do not complete the web-based assignment by this time, the system will NOT allow you to submit the assignment. Normally, no extensions will be given, except with a valid documented excuse (typically medical reasons or other university sanctioned activities).

If you miss one of the hourly exams because of a valid, documented reason, the grade portion for that exam will be added to your final exam weighting. No make-up exams will be given under any circumstances.

The evaluation of your performance in this course will be based entirely on the regular homework assignments and scheduled exams. There is no possibility to do extra work for extra credit.

Final grades will be assigned as follows:

A = 87-100%; A^- = 80-86 %
B^+ = 77-79 %; B = 73 –77 %; B^- = 70 – 73 %
C^+ = 67-69%; C = 63 -67 %; C^- = 60 – 63 %
D^+ = 57-59%; D = 53 –57 %; D^- = 50 – 53 %:   F < 50%

Expectations:

Physics is a mathematically intensive subject that presents everyone with occasional (and sometimes frequent) difficulties. You are expected to encounter problems that will challenge your limits of understanding. As a general rule, a typical student should expect to put in 5-6 hours per week outside of class to reach his/her potential in this course (though this will vary for each person, depending on abilities and background). Always contact your instructor if you need help and/or feel overwhelmed - I wish to see each and every student succeed in this class and at CNU in general!

INW Course Objectives:

This class is a lecture course that is certified to fulfill part of the Investigating the Natural World (INW) requirement in the Liberal Learning Curriculum. The learning objectives for INW lecture courses are:

- Identify the methods of inquiry that lead to scientific knowledge.

We will be discussing the historical development of many of the concepts that will be presented allowing you to observe how these principles were elucidated.

- Distinguish science from pseudo-science.

All scientific theories must make predictions and those predictions must be verified by experiment. We will touch upon some non-theories which were presented as explanations for observed effects.

- Make predictions about natural phenomena using theories and models as unifying principles.

As we develop the theories to be presented, we'll investigate the consequences of those theories and verify that the implied predictions are witnessed in nature.

- Discriminate between association and causation, and identify the types of evidence used to establish causation

A mathematical formula only associates two phenomena, we will discuss the experiments that helped determine that one actually caused the other.

Disabilities:

In order for a student to receive an accommodation for a disability, that disability must be on record in the Office of Student Affairs, 3rd Floor, David Student Union (DSU). If you believe that you have a disability, please contact Jacquelyn Barnes, Student Disability Support Specialist in Student Affairs (594-7160) to discuss your needs.

Students with documented disabilities are to notify the instructor at least seven days prior to the point at which they require an accommodation (the first day of class is recommended), in private, if accommodation is needed. The instructor will provide students with disabilities with all reasonable accommodations, but students are not exempted from fulfilling the normal requirements of the course. Work completed before the student notifies the instructor of his/her disability may be counted toward the final grade at the sole discretion of the instructor.

Success:

I want you to succeed in this course and at Christopher Newport. I encourage you to come see me during office hours or to schedule an appointment to discuss course content or to answer questions you have. If I become concerned about your course performance, attendance, engagement, or well-being, I will speak with you first. I also may submit a referral through our Captains Care Program.

The referral will be received by the Center for Academic Success as well as other departments when appropriate (Counseling Services, Office of Student Engagement). If you are an athlete, the Athletic Academic Support Coordinator will be notified. Someone will contact you to help determine what will help you succeed. Please remember that this is a means for me to support you and help foster your success at Christopher Newport.

Academic Support:

The Center for Academic Success offers free tutoring assistance for Christopher Newport students in several academic areas. Staff in the center offer individual assistance and/or workshops on various study strategies to help you perform your best in your courses. The center also houses the Alice F. Randall Writing Center. Writing consultants can help you at any stage of the writing process, from invention, to development of ideas, to polishing a final draft. The Center is not a proofreading service, but consultants can help you to recognize and find grammar and punctuation errors in your work as well as provide assistance with global tasks. Go as early in the writing process as you can, and go often! You may visit the Center for Academic Success to request a tutor, meet with a writing consultant, pick up a schedule of workshops, or make an appointment to

talk one-on-one with a University Fellow for Student Success. The Center is located in Christopher Newport Hall, first floor, room 123.

Tentative Schedule, Spring 2022 – subject to adjustment as needed!!!

Week	Topics Covered
	Part I: Motion in One and Two Dimensions
1-10 to 1-14	Units and Measurement; Scalars and Vectors
1-19 to 1-21	Kinematics in One Dimension; Velocity and Acceleration
1-24 to 1-28	Two-Dimensional Motion
1-31 to 2-4	Projectiles
	Part II: Dynamics of Motion
2-7 to 2-11	First Midterm on 2-7!!!!! Then, Newton's Laws of Motion
2-14 to 2-18	Applications of Newton's Laws
2-21 to 2-25	Forces in Circular Motion; Universal Gravitation
	Part III: Energy and Momentum
3-7 to 3-11	Work and Kinetic Energy; Conservation of Energy
3-14 to 3-16	Second Midterm on 3-14!!!!! Then, Conservation of Linear Momentum. NO CLASS ON 3-18!!!!
3-21 to 3-25	Collisions in One and Two Dimensions
	Part IV: Rotational Motion
3-28 to 4-1	Rotational Kinematics
4-4 to 4-8	Rolling Objects
4-11 to 4-15	Rotational Dynamics
4-18 to 4-22	Angular Momentum; Kepler's Laws
4-25	Review, Make-up Days, etc.