

# PHYS 251

# University Physics I

# Fall 2021

Class #2946 (4 credit hours)

**Bulletin:** Newtonian mechanics of translational and rotational motion, work, energy, power, momentum, conservation of energy and momentum, periodic motion, waves, sound, heat, and thermodynamics.

**Objectives:** Together, we'll explore the principles of mechanics and thermodynamics (space, time, mass, inertia, force, velocity, acceleration, momentum, work, energy, oscillations, waves, heat, entropy, and more) to solve practical problems and examine the physical basis of technologies surrounding us. Along the way, we'll learn how physicists view the world, see that physics is for everyone, and develop problem-solving skills of value in any career.

**Prerequisite:** MATH 165 Calculus I (we'll need differential and integral calculus)

**Instructor:** Alan Denton (he/him), Professor                      Department of Physics  
alan.denton@ndsu.edu    South Eng. 214B

**Classes:** M 9:00-9:50 am, MWF 10:00-10:50 am, A. G. Hill (STEM) 300

**Student Help and Coffee Hours:** TBA

**To succeed:** Attend classes, invest two hours out of class per hour in class, seek help!

**Textbook:** Halliday, Resnick, Walker, Fundamentals of Physics, 11<sup>th</sup> ed. (Wiley, 2018)

<b>Evaluation:</b>	Homework Assignments	200 points
	Midterm Exams (in person)	100 points each
	Final Exam (in person)	200 points
	Classroom participation	30 points

Correct responses to 90% of the homework problems will earn the maximum 200 pts. To best prepare for exams, however, I recommend attempting all homework problems. I encourage collaborative discussion of *methods and strategies* for solving problems. Your final grade will be based on homework (200 pts), your best 2 out of 3 midterm exam scores (200 pts), your final exam score (200 pts), and participation (30 pts). Classroom participation will include "clicker" questions using the TurningPoint app.

**Grades:** A: 90-100%; B: 80-89.9%; C: 70-79.9%; D: 60-69.9%; F: < 60%

**Communication:** Weekly homework will be posted on the LON-CAPA homepage:  
[http://www.ndsu.edu/physics/lon\\_capa](http://www.ndsu.edu/physics/lon_capa)

Follow the login instructions to access our course and mind the assignment deadlines.

Announcements and notes will be posted on Blackboard: <https://bb.ndsu.nodak.edu>

## Main Topics and Preliminary Timetable

Chapter 1	Measurement	Aug 25-27
Chapter 2	Motion Along a Straight Line	Aug 30-Sep 3
Labor Day Holiday	no class	Sep 6
Chapter 3	Vectors	Sep 7-10
Chapter 4	Motion in 2 and 3 Dimensions	Sep 13-17
Chapter 5	Force and Motion I	Sep 20-24
<b>Midterm Exam 1</b>	<b>Covering Chapters 1-4</b>	<b>Wed, Sep 29</b>
Chapter 6	Force and Motion II	Sep 27-Oct 1
Chapter 7	Kinetic Energy and Work	Oct 4-8
Chapter 8	Potential Energy and Conservation of Energy	Oct 11-15
Chapter 9	Center of Mass, Momentum	Oct 18-22
Chapter 10	Rotational Motion	Oct 25-29
<b>Midterm Exam 2</b>	<b>Covering Chapters 5-9</b>	<b>Wed, Nov 3</b>
Chapter 11	Rolling, Torque, and Angular Momentum	Nov 1-5
Chapter 12	Equilibrium and Elasticity	Nov 8-12
Chapter 13	Gravitation	Nov 15-19
Chapter 14	Fluids	Nov 22
Thanksgiving Break	no classes	Nov 24-26
<b>Midterm Exam 3</b>	<b>Covering Chapters 10-14</b>	<b>Wed, Dec 1</b>
Chapters 15-17	Oscillations and Waves	Nov 29 - Dec 3
Chapters 18-19	Thermodynamics: Heat, 1 <sup>st</sup> Law	Dec 6-10
Chapters 19-20	Entropy and the 2 <sup>nd</sup> Law	Dec 6-10
<b>Final Exam</b>	<b>Comprehensive</b>	<b>Dec 14, 8:00 AM</b>

### Academic Honesty and Special Needs:

*The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).*

*Any students with disabilities or special needs, who need accommodations in this course, are invited to share concerns or requests with the instructor and to contact the Disability Services Office ([www.ndsu.edu/disabilityservices](http://www.ndsu.edu/disabilityservices)) as soon as possible.*

# COVID-19 Related Information

## Communication

Course-related information will be communicated primarily during our class meetings. Reminders and notifications of any schedule changes will be communicated through NDSU email and posted on the Blackboard announcements page.

Your NDSU email address is the official route for course-related information.

Office hours will be conducted in person and via Zoom (at times to be announced).

If you have any technology concerns, please contact the IT Help Desk:

[ndsuhelpdesk@ndsu.edu](mailto:ndsuhelpdesk@ndsu.edu) 701-231-8685 (option 1)

## Submission of Homework and Posting of Grades

Homework assignments will be submitted on the LON-CAPA homepage:

[http://www.ndsu.edu/physics/lon\\_capa](http://www.ndsu.edu/physics/lon_capa)

Grades will be posted on our Blackboard course homepage.

## Copyright of Course Materials

Recording any class meetings with your own personal devices is strictly prohibited. See NDSU [Policy 190](#) on Intellectual Property.

## Health and Safety Expectations

Information on COVID-19 and NDSU's response:

[https://www.ndsu.edu/police\\_safety/covid\\_19\\_preparedness\\_and\\_response/](https://www.ndsu.edu/police_safety/covid_19_preparedness_and_response/)

I encourage all students to attend class meetings in person. According to NDSU policy and CDC guidelines, when in the classroom, you must properly wear a face covering (covering both the mouth and nose) for the entire class. Wearing a face covering helps reduce the risk to others in case you are infected but do not have symptoms, and also may protect you from infection. *Research studies show that even if vaccinated you can become infected and transmit the virus to others.*

If you fail to properly wear a face covering, you will not be admitted to the classroom. However, you may choose to participate remotely and synchronously via Zoom (see HyFlex options below).

Students who cannot wear a face covering due to a medical condition or disability may seek accommodation through Disability Services:

701-231-8463      <https://www.ndsu.edu/disabilityservices/>

Disinfecting supplies are provided for you to disinfect your learning space. You may also use your own disinfecting supplies.

Whenever possible, observe physical distancing guidelines, maintaining 2 m separation from others. Avoid congregating around the classroom entrance before or after class.

In accordance with NDSU [Policy 601](#), failure to comply with instructions, including this syllabus, may be handled according to the Code of Student Conduct resolution process and may result in disciplinary sanctions.

Food and drink are not allowed in class except with a documented accommodation through Disability Services.

*Do not come to class if you are sick.* Please protect your health and the health of others by staying home, where you may participate remotely. For information on COVID-19, symptoms, testing, and steps to stay healthy see

[https://www.ndsu.edu/studenthealthservice/covid\\_19/](https://www.ndsu.edu/studenthealthservice/covid_19/)

*Do not come to class if you have been exposed to individuals who tested positive for COVID-19 and/or you have been notified to self-quarantine due to exposure.*

If you are unable to attend class at the scheduled time due to illness or exposure, email me promptly for alternate arrangements, including accommodations and extensions.

If you are absent from class as a result of a COVID-19 diagnosis or quarantine, you will be able to participate in class remotely (see HyFlex Options below).

### **HyFlex Options**

Resource for students on HyFlex instruction, compiled by IT: <https://kb.ndsu.edu/learn>

If you are at high risk of contracting COVID-19 (or of infecting someone at high risk), you have the option of attending classes remotely via Zoom. You may opt to do so at the beginning of the semester or as the need arises during the semester.

To participate in HyFlex instruction remotely, you must have access to the requisite technology, including a laptop or computer with a functioning microphone, speakers (or headphones) and webcam, as well as reliable internet access.

### **Additional Resources for Students**

As a valued member of the NDSU community, you have access to resources should you need help in dealing with adverse reactions to things happening in the world today:

Counseling Services: 701-231-7671; <https://www.ndsu.edu/counseling/>

Disability Services: 701-231-8463; <https://www.ndsu.edu/disabilityservices/>

Student Health Service: 701-231-7331; <https://www.ndsu.edu/studenthealthservice/>

Dean of Students Office: 701-231-7701; <https://www.ndsu.edu/deanofstudents/>

### **In a Crisis or Emergency Situation:**

Call University Police: 701-231-8998

Call 9-1-1

For physical health crises: Go to a Hospital Emergency Room

For mental health crises: Go to Prairie St. John's for a Needs Assessment

510 4th St. S, Fargo (701-476-7216)

Call the FirstLink Help Line: 1-800-273-TALK (8255) or 2-1-1

Call the Rape and Abuse Crisis Center: 701-293-7273