

This syllabus was last updated on **August 1, 2023**

- Instructor:** Erik Hobbie, 1120 R1A, Research Park  
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- Bulletin Description:** Beginning course for students without a calculus background. Includes basic principles of bodies at rest and in motion, fluids, vibrations, waves, sound, and thermodynamics.  
This course has been approved for the General Sciences category in general education because “Students will learn to comprehend concepts and methods of inquiry in science and technology, and their application for society.” and “Students will learn to integrate knowledge and ideas in a coherent and meaningful manner.”
- Goals:** The primary goal of this course is to provide the students with an understanding of the basic principles of mechanics, fluids, and waves that will aid them in their careers.
- Objectives:** The students should attain a conceptual understanding and problem-solving ability such that they can readily apply their knowledge to novel problems and situations. Students shall be able to reason qualitatively and quantitatively about linear and rotational motion, forces, energy, momentum, fluids, and waves using a few foundational dynamical and conservation principles.  
Course objectives are met by readings, lectures, in-class discussions, and homework through the development of conceptual understanding and the ability to quantify concepts in specific physical situations. Students demonstrate their level of comprehension in LON-CAPA homework and exams.
- Prerequisites:** MATH 105 (Trigonometry) or higher, or consent of instructor
- Meetings:** Monday, Wednesday, and Friday 10:00-10:50 AM in *NDSU A.G.HILL Building, Room 112*. Attendance in-person is encouraged. Class attendance is expected but is not a component of the grading. Lecture recordings and PDFs will be posted on Blackboard
- Office hours:** Monday and Wednesday, 1-3 PM in R1A (or as arranged)
- Textbook:** Nicholas J. Giordano, *College Physics, Reasoning and Relationships 2nd edition*, (Brooks/Cole, Cengage Learning), Chapters 1-13
- Topics and Timing:** The textbook chapters to be discussed in this course are listed below. Most (but not all) material of each chapter will be covered. Dates in bold are midterm dates.
- Chapter 01: *Introduction* (Aug 23, 25)  
Chapter 02: *Motion, Forces, and Newton’s Laws* (Aug. 28, 30, Sept 1, *No class Mon Sept 4*)  
Chapter 03: *Forces and Motion in One Dimension* (Sept 6, **8**, 11)  
Chapter 04: *Forces and Motion in Two and Three Dimensions* (Sept 13, 15, 18)  
Chapter 05: *Circular Motion and Gravitation* (Sept 20, **22**, 25, 27)  
Chapter 06: *Work and Energy* (Sept 29, Oct 2, 4, **6**)  
Chapter 07: *Momentum, Impulse, and Collisions* (Oct 9, 11, 13, 16, 18)  
Chapter 08: *Rotational Motion* (Oct **20**, 23, 25, 27)  
Chapter 09: *Energy and Momentum of Rotational Motion* (Oct 30, Nov 1, **3**, 6)  
Chapter 10: *Fluids* (Nov 8, 13, 15, *No class Fri Nov 10*)  
Chapter 11: *Harmonic Motion and Elasticity* (Nov **17**, 20, 27, *No class M, F Nov 22, 24*)  
Chapter 12: *Waves* (Nov 29, Dec 1, 4)  
Chapter 13: *Sound* (Dec 6, 8)
- Format:** The class will involve traditional lecture formats discussions and active problem solving. Paper flash cards will be distributed. Students are encouraged to ask questions at any time during or after class.
- How to succeed:** Attending class, reviewing lecture notes, studying the textbook, taking part in class activities and discussions, seeking help through office hours, and completing homework problems are keys to success. Each student is encouraged to contact the instructor with any concerns, questions, and suggestions.

**LON-CAPA:** This course uses Blackboard with an interface to the LON-CAPA course management system to post homework, lecture notes, grades, and other information. LON-CAPA can be accessed by selecting the appropriate server at [https://www.ndsu.edu/physics/students/lon\\_capa/](https://www.ndsu.edu/physics/students/lon_capa/). Your username is everything to the left of the @ in your NDSU email address (use all lowercase letters). For example, if your email address is Sheldon.Cooper.2@ndsu.edu, then your LON-CAPA username is sheldon.cooper.2. Initially you create your own password by following the link “Forgot Password”. For help using LON-CAPA contact your instructor or laboratory technician Paul Omernik (SE110, Paul.Omernik@ndsu.edu, 231-7047)

**Homework:** 10 homework problems will be available for each textbook chapter (1-13) through LON-CAPA. From the 130 available problems, 100 need to be solved for full credit. All homework problems become available on Aug 25 and are due according to the following table:

| HW set #               | 1       | 2      | 3      | 4      | 5      | 6      |
|------------------------|---------|--------|--------|--------|--------|--------|
| chapters               | 1-2     | 3-4    | 5-6    | 7-9    | 10-11  | 12-13  |
| assigned               | Aug 25  | Aug 25 | Aug 25 | Aug 25 | Aug 25 | Aug 25 |
| due                    | Sept 11 | Oct 02 | Oct 23 | Nov 20 | Dec 04 | Dec 15 |
| # of problems assigned | 20      | 20     | 20     | 30     | 20     | 20     |

Each correctly solved problem earns 1 point (for problems with multiple parts each part counts as a problem and earns 1 point). Only 100 problems from the entire set (chapters 1-13) need to be solved. Hence, the maximal number of points for all homework sets is 100. You may work together on homework sets, but simply copying another’s answers is neither recommended nor beneficial. No late homework will be accepted.

**Exams:** The course contains 6 “midterm” exams and a comprehensive final exam. The midterm exams are all timed and will be based primarily on material covered since the last exam, but questions may require previous knowledge. The final exam will be timed and will be comprehensive, covering all course material. Each midterm exam consists of up to 8 multiple-choice problems. The final consists of 10 multiple-choice problems. Each correctly solved problem earns 2 points. The problems are a mix of conceptual and computational problem-based questions; three of the five problems tend to be simple, one or two require more advanced reasoning skills. The two lowest midterm exams will be dropped. All exams will be virtual and will be done remotely.

- Exam 01: **Fri, Sep 08** (up to 8 questions from chapters 1-2)
- Exam 02: **Fri, Sep 22** (up to 8 questions from chapters 2-3)
- Exam 03: **Fri, Oct 6** (up to 8 questions from chapters 4-5)
- Exam 04: **Fri, Oct 20** (up to 8 questions from chapters 6-8)
- Exam 05: **Fri, Nov 3** (up to 8 questions from chapters 9-11)
- Exam 06: **Fri, Nov 17** (up to 8 questions from chapter 11-13)
- Final: **Dec 11-15** (10 questions from chapters 1-13)

All exams are “open notes”. Notes include the textbook and all course material: physical, Blackboard, and Lon-Capa. I suggest you get a notebook and use it to do ALL your problems. Using computers to access notes and google information (if needed) is permitted during an exam. Communicating with others and using external help (including tutoring services such as Chegg.com) is not permitted. Violating this policy constitutes an act of academic dishonesty and leads to an F in the course. Exams can be taken from any location. Students use a device (computer, laptop, even a cell phone may work) that allows them to access and answer the exam questions through Lon-Capa during exam time. Scantrons will not be used. No makeup exams will be scheduled.

**Grading:** Grading will be based on total LON-CAPA homework score (50 % of grade), highest 4 of the 6 midterms (30 %) and final exam (20 %), with 0% - 55.0% F, 55.0% - 66.0% D, 66.0% - 77.0% C, 77.0% - 88.0% B, 88.0% -100% A. The instructor reserves the right to lower the grade cutoffs in response to class performance, but they will not be raised.

**Additional Statements:** *Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders. Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the Disability Services Office ([www.ndsu.edu/disabilityservices](http://www.ndsu.edu/disabilityservices)) as soon as possible. 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).*