

**Instructor:** Erik Hobbie, 1120 R1A, Research Park, erik.hobbie@ndsu.edu  
<https://www.ndsu.edu/faculty/hobbie/>

**Bulletin Description:** Second course for students without a calculus background. Includes electricity, magnetism, and optics, along with some more qualitative aspects of modern physics.

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:** This course provides students with an understanding of the basic principles and applications of electromagnetism, optics, and modern physics. It will guide them in their everyday lives and careers as informed members of our society.

**Objectives:** Students acquire the ability to recognize, analyze, and solve conceptual and quantitative physics problems and apply this ability to novel problems and situations.

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:** Physics 211 or consent of instructor

**Meetings:** Tuesday and Thursday 11:00AM - 12:15PM in *NDSU South Engineering, Rm 116*. You may also review the lectures and view pre-recorded video material remotely (asynchronous course participation). All course material will be posted in Lon-Capa. Lectures and lecture videos will be posted on Blackboard.

**Office hours:** Right after lecture or by arrangement

**Textbook:** Nicholas J. Giordano, *College Physics, Reasoning and Relationships 2nd edition*, (Brooks/Cole, Cengage Learning), Chapters 17-26

**Topic Outline and Timing:** The textbook chapters to be covered in this course are listed below, along with the tentative midterm exam dates (bold). Most (but not all) material of Chapters 17-26 will be covered. Topics from Chapters 27-31 will be qualitatively introduced at appropriate points throughout the course.

Chapter 17:	<i>Electric Forces and Fields</i>	Aug 27, 29, Sept 3
Chapter 18:	<i>Electric Potential</i>	Sept 5, 10, 12 (no class)
Chapter 19:	<i>Electric Currents and Circuits</i>	Sept <b>17</b> (midterm), 19, 24
Chapter 20:	<i>Magnetic Fields and Forces</i>	Sept 26, Oct 1, <b>3</b> (midterm)
Chapter 21:	<i>Magnetic Induction</i>	Oct 8, 10, 15
Chapter 22:	<i>Alternating-Current Circuits</i>	Oct 17, <b>22</b> (midterm), 24
Chapter 23:	<i>Electromagnetic Waves</i>	Oct 29, 31, Nov 5
Chapter 24:	<i>Geometrical Optics</i>	Nov 7, <b>12</b> (midterm), 14
Chapter 25:	<i>Wave Optics</i>	Nov 19, 21, <b>26</b> (midterm)
Chapter 26:	<i>Applications of Optics</i>	Nov 28 (TG Break), Dec 3, 5, 10 (Dec 12, Make-up lecture day)

**Format:** The in-class activities involve some traditional lecture plus discussions with a focus on critical thinking and problem solving. Paper flash cards may be distributed and used. Students are encouraged to engage in in-class discussions and ask questions at any time during or after class. Participation can be asynchronous through Blackboard. Class announcements will be made through email.

**How to succeed:** Attending class, reviewing lecture notes, reading the textbook, taking part in class activities and discussions, and doing homework (and additional) problems are keys to success. Each student is encouraged to contact the instructor with any concerns, questions, and suggestions. If desired, review sessions will be held prior to exams.

**LON-CAPA:** This course uses Blackboard, and the LON-CAPA course management system will be used to access homework, exams, and other materials. Ignore the LON-CAPA Grades tab: Final grades will be hand tabulated by the instructor. LON-CAPA can be accessed at <https://proteus.physics.ndsu.nodak.edu/adm/roles>. 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 john.doe.2@ndsu.edu, then your LON-CAPA username is john.doe.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). Technology concerns other than Lon-Capa can be addressed to IT Help Desk; Email: ndsu.helpdesk@ndsu.edu, Call: 701-231-8685 (option 1)

**Homework:** 10 homework problem sets, each containing 10 problems (with 8 attempts for each problem), will be assigned via the LON-CAPA online system.

Set	Topic	Open	Due	Task
1	Chapter 17	Aug 27	Sept 30	10 Problems
2	Chapter 18	Aug 27	Sept 30	10 Problems
3	Chapter 19	Aug 27	Oct 14	10 Problems
4	Chapter 20	Aug 27	Oct 14	10 Problems
5	Chapter 21	Aug 27	Nov 4	10 Problems
6	Chapter 22	Aug 27	Nov 4	10 Problems
7	Chapter 23	Aug 27	Nov 25	10 Problems
8	Chapter 24	Aug 27	Nov 25	10 Problems
9	Chapter 25	Aug 27	Dec 14	10 Problems
10	Chapter 26	Aug 27	Dec 14	10 Problems

Each correctly solved problem earns 1 point (For problems with multiple parts each part earns 1 point). 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 5 “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 either remotely or in class. All exams are “open notes” (i.e., using computers and notes is permitted during an exam). Exams can be taken from any location, including the classroom. Students bring 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:** Grade will be based on total LON-CAPA homework score (50 % of grade), highest 3 of the 5 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 scale may be adjusted.

**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 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).