

# Physics 120 - FUNDAMENTALS OF PHYSICS (3 credits) - Spring 2025

This syllabus was last updated on January 12, 2025

## Specific Course Information:

**Instructor:** Sylvio May, South Engineering 216A,  
email: Sylvio.May@ndsu.edu, web: <https://www.ndsu.edu/faculty/symay/>

**Bulletin Description:** Application of physics concepts and principles to the real world. Topics selected from mechanics, heat, optics, electricity, and magnetism. Astronomy and modern physics will also be surveyed.

This course has been approved for the General Education category PHYSICAL SCIENCE (SP) category. Students will analyze components and dynamics of natural and physical worlds, develop models to explain phenomena within the natural and physical worlds, and apply methods of scientific inquiry to enhance their understanding of the natural and physical world.

**Objectives:** The goal of this course is to provide students with the knowledge and understanding of basic physical principles that will aid them in their everyday lives, careers, and personal decision making as scientifically literate and technologically informed members of society. Students attain an appreciation for the impact of science on society and history and for the interplay between experiment and reasoning to describe, explain, and predict physical phenomena. The course creates opportunities to appreciate what humans know about the physical world as well as current frontiers of human knowledge.

**Prerequisites:** High-school algebra

**Meetings:** Tuesday and Thursday 3:30pm-4:45pm in NDSU A.G.Hill building, Rm 112. This is an in-person course. Class meetings may be recorded and made available through BlackBoard Ultra.

**Office hours:** Mon 10 am-11 am and Fri 11am-12pm in South Engineering room 216A; additional zoom or face-to-face options may be specified during the course.

**Textbook:** Art Hobson, Physics: Concepts & Connections, 5th edition, Pearson, 2010 (textbook is optional)

**Topic Outline and Timing:** The course consists of six parts, with an exam at the end of each:

Part One	Scientific Method, Making Estimates, Matter	<b>Exam1:</b> Tue, February 04 (3:30-3:50pm)
Part Two	Motion, Newton's laws, and Gravity	<b>Exam2:</b> Tue, February 25 (3:30-3:50pm)
Part Three	Energy and Thermodynamics	<b>Exam3:</b> Tue, March 25 (3:30-3:50pm)
Part Four	Electrodynamics and Waves	<b>Exam4:</b> Tue, April 15 (3:30-3:50pm)
Part Five	Special Relativity and General Relativity	<b>Exam5:</b> Tue, April 29 (3:30-3:50pm)
Part Six	Quantum Mechanics	<b>Final Exam:</b> Thu, May 15 (10:30am-12:30am)

**Format:** 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. Class announcements will be made through email. Students demonstrate their level of comprehension in homework and exams.

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

## Course Management System: BlackBoard Ultra

**Homework:** 13 homework problem sets, each containing 12 multiple-choice problems, will be assigned through BlackBoard Ultra. The total number of available problems is  $12 \times 13 = 156$ .

Part 1 (sets 1-2)	24 problems total	due Sun, Feb 02
Part 2 (sets 3-5)	36 problems total	due Sun, Feb 23
Part 3 (sets 6-7)	24 problems total	due Sun, March 23
Part 4 (sets 8-9)	24 problems total	due Sun, April 13
Part 5 (sets 10-11)	24 problems total	due Sun, April 27
Part 6 (sets 12-13)	24 problems total	due Sun, May 11

Each solved problem yields one point until a maximum score of 120 points is reached.

**Exams:** 5 midterm exams and a Final Exam will be administered. Each midterm exam will be completed within 20 minutes inside the classroom. The exact format will be communicated prior to each exam by the instructor. One midterm exam (the lowest scoring) will be dropped. The remaining 4 midterm exams yield up to 10 points each. Hence, 40 points maximum can be obtained from the exams. The Final Exam is required and yields up to 20 points.

**Presentations:** Each student will prepare and upload a PowerPoint presentation, 2-3 pages long, on a physics subject that extends or complements the course. This assignment yields up to 20 points. Every student is invited to give a 3-min presentation in the classroom (up to 5 points extra credit may be assigned).

**Grading:** will be based on homework score (max. 120 points), 4 midterm exams (max. 40 points), the Final Exam (max. 20 points), and a PowerPoint presentation (max. 20 points). From the actual number of points and the maximal number ( $120 + 40 + 20 + 20 = 200$  points) the percentage will be calculated and used to grade according to: 0%-60.0% F, 60.0%-70.0% D, 70.0%-80.0%, C 80%-90.0%, B 90.0%-100% A. Expressed in points, this corresponds to: 0-119 F, 120-139 D, 140-159 C, 160-179 B, 180-200 A. The instructor reserves the right to lower the grade cutoffs in response to class performance, but they will not be raised.

## General Course Information:

- 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 ([https://www.ndsu.edu/accessibility\\_disability](https://www.ndsu.edu/accessibility_disability)) 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).
- Your personally identifiable information and educational records as they relate to this course are subject to FERPA.
- According to NDSU Policy 331.1 (PDF download: <https://www.ndsu.edu/fileadmin/policy/333.pdf>) attendance is expected.
- 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.”