



North Central State College

MASTER SYLLABUS

2025-2026

A. Academic Division: Engineering Technology, Business & Criminal Justice Division

B. Discipline: Physics

C. Course Number and Title: PHYS1010 Introductory Physics

D. Assistant Dean: Brooke Miller, M.B.A.

E. Credit Hours: 3
Lecture: 2 hours
Laboratory: 3 hours

F. Prerequisites: MATH0084 (minimum grade of C- required)

G. Last Course/Curriculum Revision Date: Fall 2025 Origin date: 05/11/2011

H. Textbook(s) Title:

Conceptual Physics with Modified Mastering Physics Access Card

- Author(s): Hewitt
- Copyright Year: 2022
- Edition: 13th
- ISBN: 9780135745847

I. Workbook(s) and/or Lab Manual: See above

J. Course Description: This course will provide students with a general understanding, knowledge, and awareness of the physical world around them. Topics will introduce the concepts of mechanical, electrical and atomic physics with discussions, lectures, and laboratory experiences related to the principles of mechanics, heat, light, sound, electricity, magnetism, and atomic structure. This course meets the requirements for OTM in Natural Sciences TMNS.

K. College-Wide Learning Outcomes:

College-Wide Learning Outcome	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:



North Central State College

Physics 1010 Syllabus 2025 Fall

- A. **Academic Division:** Business, Industry, Technology
- B. **Discipline:** Physics
- C. **Course Number and Title:** PHYS 1010 Introductory Physics
- D. **Course Coordinator:** Wesley L Adams
Assistant Dean: Brooke Miller

Instructor Information:

- Name: Sajjad Afroosheh
- Office Hours: by appointment
- E-Mail Address safroosheh@ncstatecollege.edu

- E. **Credit Hours:** 3

Lecture: 2 hours
Laboratory: 3 hours

- F. **Prerequisites:** MATH0084 (minimum grade of C- required)

- G. **Syllabus Effective Date:** Fall, 2025

- H. **Textbook(s) Title:**

Conceptual Physics

- Author(s): Hewitt
- Copyright Year: 2021
- Edition: 13th
- ISBN #: 978-0-135-74626-4

- I. **Workbook(s) and/or Lab Manual:** None, see above.

J. **Course Description:** This course will provide students with a general understanding, knowledge, and awareness of the physical world around them. Topics will introduce the concepts of mechanical, electrical and atomic physics with discussions, lectures, and laboratory experiences related to the principles of mechanics, heat, light, sound, electricity, magnetism, and atomic structure. This course meets the requirements for OTM in Natural Sciences TMNS.

- K. **Core Learning Outcomes:**

Core Learning Outcomes	Assessments - How it is met & When it is met.
Communication – Written	Exams during weeks 1-16
Communication – Speech	Final Project
Intercultural Knowledge and Competence	Exams during weeks 1-16

Physics 1010 Syllabus 2025 Fall

Critical Thinking	Homework, labs, quizzes, and exams during weeks 1-16
Information Literacy	Labs during weeks 1-16
Quantitative Literacy	Homework, labs, quizzes, and exams during weeks 1-16

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall be able to:

Outcomes	Assessments - How it is met & When it is met
1. Calculate one or two missing variables, given a problem in one dimension (involving time, position, velocity, and acceleration) of a single object.	Class discussions, homework, labs, quizzes, and exams
2. Use Newton's laws of motion to identify the reaction force, to solve a given problem involving the force interaction of two objects.	Class discussions, homework, labs, quizzes, and exams
3. Use Newton's laws of motion to calculate the missing variables, including force, given a problem involving one mass, with a constant acceleration.	Class discussions, homework, labs, quizzes, and exams
4. Use conservation of energy to solve a problem involving one object with kinetic energy and gravitational potential energy for one unknown variable.	Class discussions, homework, labs, quizzes, and exams
5. Use the law rotational equilibrium to solve a problem involving one rigid body and up to three forces for one unknown variable.	Class discussions, homework, labs, quizzes, and exams
6. Be able to describe the proton, neutron, and electron including where they are located in the atom, and use the definitions of isotope, atomic number, and atomic mass to calculate the number of protons, neutrons, and electrons in an atom.	Class discussions, homework, labs, quizzes, and exams
7. Solve for the indicated variable in problems involving Archimedes' principle.	Class discussions, homework, labs, quizzes, and exams
8. Solve for the pressure, volume, temperature, mass of gas, or amount of gas in ideal gas law problems.	Class discussions, homework, labs, quizzes, and exams
9. Calculate the final temperature of a mixture of two equal size samples of one substance at two temperatures.	Class discussions, homework, labs, quizzes, and exams
10. Solve for one of the variables in a specific heat problem for a single substance.	Class discussions, homework, labs, quizzes, and exams
11. Solve for one of the variables in a thermal expansion problem for a single substance.	Class discussions, homework, labs, quizzes, and exams
12. Solve for the heat necessary to produce one to two phase changes for a single substance.	Class discussions, homework, labs, quizzes, and exams

Physics 1010 Syllabus 2025 Fall

13. Calculate the period or frequency given the other for a vibrating object or wave.	Class discussions, homework, labs, quizzes, and exams
14. Calculate the frequency, wavelength, or velocity given the others for a wave.	Class discussions, homework, labs, quizzes, and exams
15. Calculate the frequency of the beats produced by two given frequencies of sound.	Class discussions, homework, labs, quizzes, and exams
16. Solve an electrostatics problem using Coulomb's Law.	Class discussions, homework, labs, quizzes, and exams
17. Solve for the equivalent resistance for up to three resistors in a series or parallel electric current.	Class discussions, homework, labs, quizzes, and exams
18. Determine the direction of the magnetic field around a current carrying wire.	Class discussions, homework, labs, quizzes, and exams
19. Solve for the direction of the force on a moving charge in a magnetic field.	Class discussions, homework, labs, quizzes, and exams

Evaluation of the above will be determined by:

1. The appropriate solution formula
2. Correct substitution into said formula
3. The logical consistency of the methods and mathematical steps
4. Correctness of the final numerical result, including proper units

M. Topical Timeline:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Newton's 1st Law of Motion 2. Linear Motion 3. Newton's 2nd Law of Motion 4. Newton's 3rd Law of Motion 5. Energy 6. Rotational Motion 7. The Atomic Nature of Matter 8. Solids 9. Liquids | <ol style="list-style-type: none"> 10. Gasses and Plasmas 11. Temperature, Heat, and Expansion 12. Heat Transfer 13. Change of Phase 14. Vibrations & Waves 15. Sound 16. Electrostatics 17. Electric Current 18. Magnetism |
|--|---|

Physics 1010 Syllabus 2025 Fall

N. Course Assignment Calendar (Subject to Change):

Week	Topics/ Chapter - Section	Week	Topics/ Chapter - Section
1 08/11	Introduction/Syllabus 01 About Science	9 10/13	15 Temperature, Heat, and Expansion 16 Heat Transfer
2 08/18	02 Newton's First Law of Motion - Inertia 03 Linear Motion 04 Newton's Second Law of Motion	10 10/20	17 Change of Phase 18 Thermodynamics
3 08/25	05 Newton's Third Law of Motion Exam 1 (Chapters 01 - 05)	11 10/27	Exam 4 (Chapters 15 - 18) 19 Vibrations and Waves 20 Sound
4 09/01	06 Momentum 07 Energy	12 11/03	21 Musical Sounds Exam 5 (Chapters 19 - 21)
5 09/08	08 Rotational Motion 09 Gravity	13 11/10	22 Electrostatics 23 Electric Current
6 09/15	10 Projectile and Satellite Motion Exam 2 (Chapters 06 - 10)	14 11/17	24 Magnetism 25 Electromagnetic Induction
7 09/22	11 The Atomic Nature of Matter 12 Solids	15 11/24	Exam 6 (Chapters 22 - 25) Thanksgiving Break
8 09/29	13 Liquids 14 Gases Exam 3 (Chapters 11 - 14)	16 12/01	Presentations
10/06	Fall Break	17 12/08	Finals Week

O. Course Grading Scale:

> 93%	92% - 90%	89% - 87%	86% - 83%	82% - 80%	79% - 77%	76% - 73%	72% - 70%	69% - 67%	66% - 63%	62% - 60%	< 60%
A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

P. Grading and Testing Guidelines:

Assessment of your learning will come in two primary ways. First, you will be graded on your application of physics concepts in solving conceptual and mathematical problems. This grade will come from quizzes, homework assignments, and exams. Secondly, assessment will be done in class through questions you will answer and demonstrations you will work together to explain. The student is responsible for his or her active learning in the course.

Grade weights: **Assignments 30%, Labs 15%, Exams 40%, and Final Presentation 15%**

Grade Policy

Assignments: Assignments are required to be done online at www.masteringphysics.com by the due date given. To register, **first log into the class NCSC Canvas** site and select the MyLab and Mastering tab. From there you can use the number from your textbook or buy one there. **See the pdf file for registration.** Assignments submitted after the due date will be marked down 3% for each day after the due date, down to receiving 50% credit. These assignments require time and are not conducive to procrastination. Note that the assignments are due when the unit is over, or the same day as the unit exam. Some time may be given at the beginning of class for homework related questions.

Lab: Part of the class will include semi-weekly labs that will relate to the lecture part of the week. Labs will be online through canvas.

Exams: There will be five exams and **NO FINAL**. All exams will be given on canvas, the exams will be available at the start of the semester, but must be completed before the assigned due date. Each exam will have a time limit of about an hour. You may use the textbook during the exams however you are not allowed to work with other classmates. If you are unable to complete or unable to take the exam before the due date you must notify the instructor **prior to the test day** or you may receive a late penalty.

Final Presentation: In place of the Final Exam, we will be giving group presentations. You and your group will choose a topic from the textbook, or another topic related to physics that you have discussed and approved with me. The presentations will be no longer than 30 mins and will be you and your group telling us what you have learned from your independent study of your chosen topic.

Masteringphysics Suggestions:

- ✓ Read the submission instructions carefully. Many problems specifically state how the answer is to be submitted.
- ✓ Carefully watch your significant figures (most problems require about 3 significant figures). If you use the incorrect number of significant figures, your answer can be marked wrong.
- ✓ Use the hints! You are NOT penalized for reading the hints. (You are penalized if you incorrectly answer a question within the hints).
- ✓ Do the problems on paper and save them for later. You will probably want to refer to them later.
- ✓ Each numerical answer asks for specific units. Be sure you pay close attention to these.
- ✓ Ask questions! Don't keep submitting answers over and over and over again, only to get them wrong. Ask for help!
- ✓ Use the numerical values given in the problem. Most problems randomize the numbers, so you and your classmates will have different numbers.

Q. Examination Policy:

There will be periodic tests, during the weeks shown in *PHYS 1010 Course Schedule & Assignments*.

All tests will have multiple choice questions and problem-solving questions, for which you must show all your work. Most of the questions are challenging.

S. Classroom Expectations:

Online Course

T. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

- * *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at

<https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf>

Outcomes	Assessments – How it is met & When it is met
1. Calculate one or two missing variables, given a problem in one dimension (involving time, position, velocity, and acceleration) of a single object.	Class discussions, homework, labs, quizzes, and exams during the weeks 1-16
2. Use Newton's laws of motion to identify the reaction force, to solve a given problem involving the force interaction of two objects.	Class discussions, homework, labs, quizzes, and exams during the weeks 1-16
3. Use Newton's laws of motion to calculate the missing variables, including force, given a problem involving one mass, with a constant acceleration.	Class discussions, homework, labs, quizzes, and exams during the weeks 3-16
4. Use conservation of energy to solve a problem involving one object with kinetic energy and gravitational potential energy for one unknown variable.	Class discussions, homework, labs, quizzes, and exams during the weeks 4-16
5. Use the law rotational equilibrium to solve a problem involving one rigid body and up to three forces for one unknown variable.	Class discussions, homework, labs, quizzes, and exams during the weeks 5-16
6. Be able to describe the proton, neutron, and electron including where they are located in the atom, and use the definitions of isotope, atomic number, and atomic mass to calculate the number of protons, neutrons, and electrons in an atom.	Class discussions, homework, labs, quizzes, and exams during the weeks 6-16
7. Solve for the indicated variable in problems involving Archimedes' principle.	Class discussions, homework, labs, quizzes, and exams during the weeks 7-16
8. Solve for the pressure, volume, temperature, mass of gas, or amount of gas in ideal gas law problems.	Class discussions, homework, labs, quizzes, and exams during the weeks 8-16
9. Calculate the final temperature of a mixture of two equal size samples of one substance at two temperatures.	Class discussions, homework, labs, quizzes, and exams during the weeks 9-16
10. Solve for one of the variables in a specific heat problem for a single substance.	Class discussions, homework, labs, quizzes, and exams during the weeks 9-16
11. Solve for one of the variables in a thermal expansion problem for a single substance.	Class discussions, homework, labs, quizzes, and exams during the weeks 9-16
12. Solve for the heat necessary to produce one to two phase changes for a single substance.	Class discussions, homework, labs, quizzes, and exams during the weeks 10-16
13. Calculate the period or frequency given the other for a vibrating object or wave.	Class discussions, homework, labs, quizzes, and exams during the weeks 11-16
14. Calculate the frequency, wavelength, or velocity given the others for a wave.	Class discussions, homework, labs, quizzes, and exams during the weeks 11-16
15. Calculate the frequency of the beats produced by two given frequencies of sound.	Class discussions, homework, labs, quizzes, and exams during the weeks 12-16
16. Solve an electrostatics problem using Coulomb's Law.	Class discussions, homework, labs, quizzes, and exams during the weeks 13-16
17. Solve for the equivalent resistance for up to three resistors in a series or parallel electric current.	Class discussions, homework, labs, quizzes, and exams during the weeks 14-16
18. Determine the direction of the magnetic field around a current carrying wire.	Class discussions, homework, labs, quizzes, and exams during the weeks 15-16
19. Solve for the direction of the force on a moving charge in a magnetic field.	Class discussions, homework, labs, quizzes, and exams during the weeks 15-16

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior

90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70–72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63–66	D	1.00	Below Average
60–62	D-	0.67	Poor
00–59	F	0.00	Failure

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