

Washtenaw Community College Comprehensive Report

PHY 105 Conceptual Physics Effective Term: Fall 2025

Course Cover

College: Math, Science and Engineering Tech

Division: Math, Science and Engineering Tech

Department: Physical Sciences

Discipline: Physics

Course Number: 105

Org Number: 12340

Full Course Title: Conceptual Physics

Transcript Title: Conceptual Physics

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Outcomes/Assessment

Rationale: Update course master syllabus to reflect changes discussed in course assessment.

Proposed Start Semester: Fall 2024

Course Description: In this course, students will survey the major topics of Newtonian mechanics, heat, vibration and waves, electromagnetism and light using a conceptual approach with a minimum of mathematics. Laboratory exercises are included to assist students in understanding and applying the above topics. This course was designed for non-physics majors with no previous physics experience.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 45 **Student:** 45

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

MACRAO

MACRAO Science & Math

MACRAO Lab Science Course
General Education Area 4 - Natural Science
 Assoc in Applied Sci - Area 4
 Assoc in Science - Area 4
 Assoc in Arts - Area 4
Michigan Transfer Agreement - MTA
 MTA Lab Science

Request Course Transfer

Proposed For:

Eastern Michigan University
 Ferris State University
 Grand Valley State University
 Jackson Community College
 Kendall School of Design (Ferris)
 Lawrence Tech
 Michigan State University
 Oakland University
 University of Detroit - Mercy
 University of Michigan
 Wayne State University
 Western Michigan University
 Central Michigan University

Student Learning Outcomes

1. Identify and recognize physical principles related to Newtonian mechanics, heat, vibration and waves, electromagnetism and light.

Assessment 1

Assessment Tool: Outcome-related departmental exam questions
 Assessment Date: Fall 2025
 Assessment Cycle: Annually
 Course section(s)/other population: All sections
 Number students to be assessed: All students
 How the assessment will be scored: Answer key
 Standard of success to be used for this assessment: 75% of the students who take the exam will score 75% or greater.
 Who will score and analyze the data: Departmental faculty

2. Solve problems pertaining to Newtonian mechanics, heat, vibration and waves, electromagnetism and light.

Assessment 1

Assessment Tool: Outcome-related laboratory exercises
 Assessment Date: Fall 2025
 Assessment Cycle: Every Three Years
 Course section(s)/other population: All sections
 Number students to be assessed: All students
 How the assessment will be scored: Answer key
 Standard of success to be used for this assessment: 75% of the students who completed each lab exercise will score 75% or greater.
 Who will score and analyze the data: Departmental faculty

Course Objectives

1. Define displacement, velocity, and acceleration.
2. Define Newton's three force laws as well as the concepts of mass and weight.

3. Define the attributes of gravitational, elastic and frictional forces, and identify the existence of these forces in problem situations.
4. Define the concept of work and the law of conservation of energy.
5. Apply the concept of work and the law of conservation of energy to physical situations similar to those discussed in class, as well as those selected from the problems in the text.
6. Define the concept of impulse and the law of conservation of momentum.
7. Apply the concept of impulse and the law of conservation of momentum to physical situations similar to those discussed in class, as well as those selected from the problems in the text
8. Define circular motion.
9. Define the concept of moment of inertia.
10. Demonstrate the application of the definition of Torque.
11. Define the law of conservation of angular momentum.
12. Apply force and torque concepts to equilibrium situations.
13. Define the concept of centripetal acceleration and force.
14. Define density and pressure.
15. Define Pascal's and Bernoulli's principle.
16. Define buoyancy and Archimedes's principle.
17. Define common terms used in the description of vibration and wave motion.
18. Define the concept of a standing wave.
19. Define the common terms of heat and temperature.
20. Define the concept of electric charge and how charges interact.
21. Define the concept of resistance, current and voltage, and how they are related by Ohm's law.
22. Define the concept of magnetic poles and how they interact.
23. Define polarization, reflection and refraction of light.
24. Define the spectrum of visible light.

New Resources for Course

Course Textbooks/Resources

Textbooks

Manuals

Periodicals

Software

Equipment/Facilities

Level I classroom

Level III classroom

Data projector/computer

Reviewer

Faculty Preparer:

Weishu Bu

Action

Faculty Preparer

Date

Apr 05, 2024

Department Chair/Area Director:

Suzanne Albach

Recommend Approval

Apr 05, 2024

Dean:

Tracy Schwab

Recommend Approval

Apr 08, 2024

Curriculum Committee Chair:

Randy Van Wagnen

Recommend Approval

Mar 30, 2025

Assessment Committee Chair:

Jessica Hale

Recommend Approval

Apr 13, 2025

Vice President for Instruction:

Brandon Tucker

Approve

Apr 15, 2025

Washtenaw Community College Comprehensive Report

PHY 105 Conceptual Physics Effective Term: Spring/Summer 2021

Course Cover

Division: Math, Science and Engineering Tech

Department: Physical Sciences

Discipline: Physics

Course Number: 105

Org Number: 12340

Full Course Title: Conceptual Physics

Transcript Title: Conceptual Physics

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Outcomes/Assessment

Objectives/Evaluation

Rationale: Update course assessment cycle to increase the amount of data.

Proposed Start Semester: Fall 2020

Course Description: In this course, students survey the major topics of Newtonian mechanics, heat, vibration and waves, electromagnetism and light using a conceptual approach with a minimum of mathematics. Laboratory exercises are included to assist students in understanding and applying the above topics. This course was designed for non-physics majors with no previous physics experience.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 45 **Student:** 45

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

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College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

MACRAO

MACRAO Science & Math

MACRAO Lab Science Course
General Education Area 4 - Natural Science
Assoc in Applied Sci - Area 4
Assoc in Science - Area 4
Assoc in Arts - Area 4
Michigan Transfer Agreement - MTA
MTA Lab Science

Request Course Transfer

Proposed For:

Eastern Michigan University

Student Learning Outcomes

1. Identify and recognize physical principles related to Newtonian mechanics, heat, vibration and waves, electromagnetism and light.

Assessment 1

Assessment Tool: Topic specific outcome-related exam questions

Assessment Date: Fall 2021

Assessment Cycle: Each Semester

Course section(s)/other population: All sections starting Fall 2021 for two years.

Number students to be assessed: All students

How the assessment will be scored: Departmental rubric will be used to score the exam.

Standard of success to be used for this assessment: 75% of the students who take the exam will score 70% or greater.

Who will score and analyze the data: Lead instructor

Assessment 2

Assessment Tool: Topic specific lab exercises

Assessment Date: Fall 2021

Assessment Cycle: Each Semester

Course section(s)/other population: All sections starting Fall 2021 for two years.

Number students to be assessed: All students

How the assessment will be scored: Departmental rubric

Standard of success to be used for this assessment: 75% of the students who take the exam will score 70% or greater.

Who will score and analyze the data: Lead instructor

Course Objectives

1. Define displacement, velocity, and acceleration.
2. Define Newton's three force laws as well as the concepts of mass and weight.
3. Define the attributes of gravitational, elastic and frictional forces, and identify the existence of these forces in problem situations.
4. Define the concept of work and the law of conservation of energy, and how they apply to physical situations similar to those discussed in class and those selected from the problems in the text.
5. Define the concept of impulse and the law of conservation of momentum, and how they apply to physical situations similar to those discussed in class and those selected from the problems in the text.
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14. Define buoyancy and Archimedes's principle.

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20. Define the concept of magnetic poles and how they interact.
21. Define polarization, reflection and refraction of light.
22. Define the spectrum of visible light.

New Resources for Course

Course Textbooks/Resources

Textbooks

Hewitt, Paul G. *Conceptual Physics*, 12th ed. Pearson, 2015, ISBN: 9780321909107.

Manuals

Periodicals

Software

Equipment/Facilities

Level I classroom

Level III classroom

Data projector/computer

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Robert Hagood</i>	<i>Faculty Preparer</i>	<i>Jan 21, 2020</i>
Department Chair/Area Director: <i>Suzanne Albach</i>	<i>Recommend Approval</i>	<i>Jan 22, 2020</i>
Dean: <i>Victor Vega</i>	<i>Recommend Approval</i>	<i>Jan 23, 2020</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Jan 21, 2021</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Jan 27, 2021</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Jan 30, 2021</i>