

# 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

**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

### **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.
6. Define circular motion.
7. Define the concept of moment of inertia.
8. Demonstrate the application of the definition of Torque.
9. Define the law of conservation of angular momentum.
10. Apply force and torque concepts to equilibrium situations.
11. Define the concept of centripetal acceleration and force.
12. Define density and pressure.
13. Define Pascal's and Bernoulli's principle.
14. Define buoyancy and Archimedes's principle.

15. Define common terms used in the description of vibration and wave motion.
16. Define the concept of a standing wave.
17. Define the common terms of heat and temperature.
18. Define the concept of electric charge and how charges interact.
19. Define the concept of resistance, current and voltage, and how they are related by Ohm's law.
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

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