

Washtenaw Community College Comprehensive Report

PHY 111 General Physics I Effective Term: Fall 2022

Course Cover

College: Math, Science and Engineering Tech

Division: Math, Science and Engineering Tech

Department: Physical Sciences

Discipline: Physics

Course Number: 111

Org Number: 12340

Full Course Title: General Physics I

Transcript Title: General Physics I

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:

Other:

Rationale: Three-year syllabus review; no changes suggested.

Proposed Start Semester: Spring/Summer 2022

Course Description: This is the first of a two-course sequence in algebra-trigonometry based Newtonian physics for pre-professional and liberal art students. Physics 111 introduces and develops the concepts of kinematics, forces, work-energy, impulse-momentum (translational and angular), fluids, vibration and waves and thermodynamics. Laboratory exercises are included to assist students in understanding and applying the above topics.

Course Credit Hours

Variable hours: Yes

Credits: 0 – 4

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

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

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

Total Contact Hours: Instructor: 0 to 90 **Student:** 0 to 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 7

Requisites

Prerequisite

Academic Math Level 7

or

Prerequisite

Academic Math Level 5 and MTH 178 minimum grade "C", may enroll concurrently
or

Prerequisite

Academic Math Level 5 and MTH 180 minimum grade "C", may enroll concurrently

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

Grand Valley State University

Lawrence Tech

Oakland University

University of Detroit - Mercy

University of Michigan

Wayne State University

Western Michigan University

Student Learning Outcomes

1. Identify and recognize concepts and principles related to mechanics, wave motion and sound, temperature and heat.

Assessment 1

Assessment Tool: Outcome-related final exam questions

Assessment Date: Fall 2024

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: Concept questions will be given 1 point if correct and zero points if incorrect. Problems will be based on 4 points as follows: 0 - did nothing; 1 - started problem, but not correct method; 2- started problem and had the correct approach; 3 - did most of the problem correctly, a small error; 4 - problem correctly solved.

Standard of success to be used for this assessment: 70% of all students taking the assessment test will score at least 75%

Who will score and analyze the data: All full-time faculty

2. Apply appropriate physical principles to solve problems.

Assessment 1

Assessment Tool: Outcome-related final exam questions

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Standard of success to be used for this assessment: 70% of all students taking the assessment test will score at least 75%

Who will score and analyze the data: All full-time faculty

Assessment 2

Assessment Tool: Lab Reports

Assessment Date: Fall 2024

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: A random sample of 10 students from each section with a minimum of one full section

How the assessment will be scored: Departmentally-developed rubric using a scale of 0 - 4.

Standard of success to be used for this assessment: 70% of all students will score at least 75%

Who will score and analyze the data: All full-time faculty

Course Objectives

1. Define displacement, velocity and acceleration.
2. Do vector addition and subtraction.
3. Solve kinematics problems (English and/or metric units) similar to those selected from the problems in text.
4. State and explain Newton's three Laws of Motion as well as the concepts of mass and weight.
5. Describe the attributes of gravitational, elastic and frictional forces, their modeling and identify the existence of these forces in problem situations.
6. Apply knowledge of forces to solve problems similar to those seen in class and those selected from the problems in the text.
7. Compute work and power using their definitions.
8. Compute changes in kinetic, gravitational and elastic energy as they relate to the work-energy theorem.
9. Compute how and when to efficiently apply work-energy concepts to solve problems similar to those seen in class and those selected from the problems in the text.
10. Explain the components of impulse-momentum and how they differ from $F=ma$.
11. Compute how and when to efficiently apply impulse-momentum concepts to solve problems similar to those seen in class and those selected from the problems in the text.
12. Describe the properties of the center of mass of a system of particles.
13. Describe the properties not attributable to the center of mass of a system of particles.
14. Compute how and when to efficiently apply center of mass concepts to solve problems similar to those seen in class and those selected from the problems in the text.
15. Define angular kinematics.
16. Solve angular kinematics problems (English and/or metric) similar to those selected from the problems in the text.
17. Describe the concept of moment of inertia and its relationship to angular acceleration.
18. Apply knowledge of forces and torques to solve problems similar to those seen in class and those selected from the problems in the text.
19. Compute how and when to efficiently apply angular impulse-momentum concepts to solve problems similar to those seen in class and those selected from the problems in the text.
20. Apply force and torque concepts to equilibrium situations.
21. Define density and pressure.
22. Apply force concepts to a fluid material.
23. Apply work-energy concepts to a fluid.
24. Description of vibration and wave motion concepts and related equations.
25. Vibration and wave motion problems similar to those seen in class and those selected from the problems in the text.

26. Define the common terms of heat and temperature.

27. Compute the heat required to change a material's temperature and phase.

New Resources for Course

Course Textbooks/Resources

Textbooks

Serway/Vuille . *College Physics*, 11 ed. Cengage, 2016, ISBN: 978-1-305-952.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Amir Fayaz</i>	<i>Faculty Preparer</i>	<i>Oct 25, 2021</i>
Department Chair/Area Director: <i>Suzanne Albach</i>	<i>Recommend Approval</i>	<i>Jan 11, 2022</i>
Dean: <i>Victor Vega</i>	<i>Recommend Approval</i>	<i>Jan 12, 2022</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Mar 22, 2022</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Mar 28, 2022</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Apr 05, 2022</i>

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Department: Physical Sciences

Discipline: Physics

Course Number: 111

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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:

Consultation with all departments affected by this course is required.

Course description

Outcomes/Assessment

Objectives/Evaluation

Rationale: Update syllabus after assessing the course.

Proposed Start Semester: Spring/Summer 2018

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General Education

MACRAO

MACRAO Science & Math

MACRAO Lab Science Course

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University of Michigan
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Western Michigan University

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<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Robert Hagood</i>	<i>Faculty Preparer</i>	<i>Jun 08, 2017</i>
Department Chair/Area Director: <i>Kathleen Butcher</i>	<i>Recommend Approval</i>	<i>Oct 05, 2017</i>
Dean: <i>Kristin Good</i>	<i>Recommend Approval</i>	<i>Oct 11, 2017</i>
Curriculum Committee Chair: <i>Lisa Veasey</i>	<i>Recommend Approval</i>	<i>Nov 28, 2017</i>
Assessment Committee Chair: <i>Michelle Garey</i>	<i>Recommend Approval</i>	<i>Nov 28, 2017</i>
Vice President for Instruction:		

Kimberly Hurns

Approve

Dec 02, 2017