

# Minnesota State University Moorhead

## PHYS 202: Introduction to 20th Century Physics

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 1

OJT Hours/Week: \*.\*

Prerequisites:

This course requires either of these prerequisite categories

1. PHYS 201 - General Physics II & Lab

Or

2. PHYS 161 - College Physics II & Lab

Corequisites: PHYS 305

MnTC Goals: None

Introduction to physics topics in 20th century physics: thermodynamics, physical optics, and overview of atomic, molecular, and particle physics. A weekly hour long lab period is included in regular class hours.

**B. COURSE EFFECTIVE DATES:** 03/04/2013 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Ideal gas law.
2. Thermodynamics of heat engines.
3. Introduction to statistical mechanics.
4. Definition of entropy in terms of states.
5. Laws of thermodynamics.
6. Heat engines.
7. Introduction to waves.
8. Physical optics, including interference and diffraction.
9. Polarization of light.
10. Light as a particle, including photoelectric effect and blackbody radiation.
11. Introduction to matter waves: the DeBroglie hypothesis.

### D. LEARNING OUTCOMES (General)

1. Apply concepts in each of the major content areas to problems in both experimental and theoretical physics.
2. Demonstrate appropriate mathematical skills.
3. Draw both quantitative and qualitative conclusions from experimental data.
4. Communicate scientific ideas.
5. Demonstrate scientific reasoning.

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted