

# Minnesota State University Moorhead

## PHYS 322: Elementary Modern Physics

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires both of these prerequisites

PHYS 201 - Physics II with Calculus & Lab

PHYS 202 - Introduction to 20th Century Physics

Corequisites: PHYS 306

MnTC Goals: None

An introduction to special relativity, the Bohr atom, wave mechanics and the Schrodinger equation, the hydrogen atom, many electron atoms, nuclear properties and reactions and elementary particles.

**B. COURSE EFFECTIVE DATES:** 04/11/2000 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Special-relativity
2. Bohr model of the atom
3. Wave mechanics and the Schrodinger equation
4. Many-electron atoms
5. The following topics may also be discussed, depending on instructor or class: Molecules, Nuclear properties and reactions, General relativity

### D. LEARNING OUTCOMES (General)

1. Develop basic knowledge of experimental and theoretical modern physics
2. Demonstrate skill in the use of mathematical methods including algebra, calculus, ordinary and partial differential equations, and vector calculus in the solution of problems
3. Demonstrate ability to draw both quantitative and qualitative conclusions from experimental data
4. Develop ability to communicate scientific ideas and reasoning, both in written and oral form
5. Recognize the difference between careful and careless reasoning
6. Develop the ability for self-assessment and recognition of the need for further information
7. Develop the ability to analyze problems and determine the fundamental principles involved

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

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

### G. SPECIAL INFORMATION

None noted