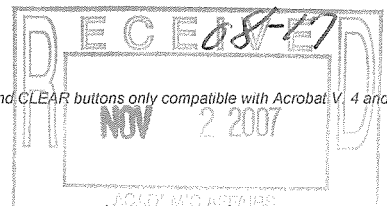




Minnesota State University, Mankato HOLD and CLEAR buttons only compatible with Acrobat V. 4 and 5  
**Curriculum Proposal**



Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

|                          |                                     |   |                            |
|--------------------------|-------------------------------------|---|----------------------------|
|                          |                                     | (Check all that apply):                           | Proposal # <b>59</b>       |
| College:                 | Science, Engineering and Technology | <input checked="" type="checkbox"/> Undergraduate | Effective Date of Change:  |
| Department:              | Physics and Astronomy               | <input type="checkbox"/> Graduate                 | Academic Year <b>07-08</b> |
| Program:                 | Physics B.S.                        | CIP # _____                                       | (For Office Use Only)      |
| Type of Change Proposed: | COURSE PROPOSALS                    |   | <b>Course Designator</b>   |
|                          | Change in Credits                   |   | <b>Number of Credits</b>   |
| Title Current:           | General Physics II                  |   | PHYS 222                   |
| Title Proposed:          | General Physics II                  |   | PHYS 222                   |
| 24-Char. Abbrev:         | General Physics II                  |   | 5                          |
|                          |                                     |   | 3                          |
|                          |                                     |   | (if applicable)            |

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

Designed for science and engineering students. Calculus-based physics. Covers electrical charge and field; magnetic field and its sources; current and resistance; simple DC and AC circuits; and electromagnetic induction. Lecture only. (Associated laboratory course is PHYS 232.)  
 Pre: MATH 122 with a "C" or better; and PHYS 221 with a "C" or better.  
 Fall, Spring

**Rationale or Justification for change:**

We propose to change the General Physics sequence from the current two semester sequence [5cr + 5cr] to a three semester on [4cr + (3+1)cr + (3+1)cr]. We believe the current two semester sequence gives students too much material in a short time. By making this change we hope to accomplish the following:  
 1. Give students more time to absorb the material.  
 2. Improve student retention rate and understanding of physics.  
This is the second course in the proposed General Physics series. The laboratory is separated from the lecture in order to give students options to take the course with or without the laboratory.

**\*\*\*For General Education or Cultural Diversity Courses Only\*\*\***

|  |  |  |
|--|--|--|
| <b>General Education Course:</b>   |  | <b>Cultural Diversity Course:</b><br>(Please check one.)<br><input type="checkbox"/> Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)<br><input type="checkbox"/> Related (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.) |
| GE Category #  | GE Category Name (Maximum of 3 Categories) |  |
| N/A  |  |  |
| N/A  |  |  |
| <p>? For Writing Intensive Courses, attach a description of the kind and quantity of writing.<br/>                 ? For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.</p>  |  |  |
| <p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline.<br/>                 b. Course's student learning outcomes associated with each GE competency or CD designation.<br/>                 c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.</p> |  |  |

**\*\*\*For New Courses\*\*\***

|  |  |   |  |
|--|--|---|--|
| (Check all that apply):  |  | Instructional Type: <input type="checkbox"/> Lecture                        | Course will be offered:                  |
| <input type="checkbox"/> Course is an elective.  |  | Grading Format: <input type="checkbox"/> Grade <input type="checkbox"/> P/N | <input type="checkbox"/> Fall Semester   |
| <input type="checkbox"/> Course is required for program  |  |   | <input type="checkbox"/> Spring Semester |
| <input type="checkbox"/> Pre- or Co-requisites:  |  |   | <input type="checkbox"/> Summer Session  |
| <input type="checkbox"/> Other courses are being changed or eliminated. (Explain.) _____   |  |   |  |
| <input type="checkbox"/> Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)   |  |   |  |
| <p>Attach paper copies of the following:</p> <p>a. Syllabus or course outline.<br/>                 b. Course's student learning outcomes.<br/>                 c. A list of resources required to offer and support this course.<br/>                 d. A description of how teaching this course will affect department staffing.<br/>                 e. If 400/500 level course, an explanation of added expectations of graduate students.</p> |  |   |  |



Minnesota State University, Mankato  
Curriculum Proposal

\*\*\*Signature Page\*\*\*

|  |                      |  |                    |
|--|----------------------|--|--------------------|
| <b>Department</b>  |                      |  |                    |
| <input checked="" type="checkbox"/> Recommended                      | (Category/ies _____) | <u>Mark D. Rich</u>                              | <u>9 Oct. 2007</u> |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | Department Chair                                 | Date               |
| Comments:  |                      |  |                    |
| <b>College Curriculum Committee</b>                                  |                      |  |                    |
| <input checked="" type="checkbox"/> Recommended                      | (Category/ies _____) | <u>[Signature]</u>                               | <u>10/30/07</u>    |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | Committee Chair                                  | Date               |
| Comments:  |                      |  |                    |
| <b>College Dean</b>  |                      |  |                    |
| <input checked="" type="checkbox"/> Recommended                      | (Category/ies _____) | <u>[Signature]</u>                               | <u>10/31/07</u>    |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | Dean   | Date               |
| Comments:  |                      |  |                    |
| <b>General Education Subcommittee</b>                                |                      |  |                    |
| <input type="checkbox"/> Recommended                                 | (Category/ies _____) |  |                    |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | General Education Subcommittee Chair             | Date               |
| Comments:  |                      |  |                    |
| <b>Undergraduate Curriculum and Academic Policy Committee</b>        |                      |  |                    |
| <input checked="" type="checkbox"/> Recommended                      | (Category/ies _____) | <u>[Signature]</u>                               | <u>12/10/07</u>    |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | UCAP Faculty Chair                               | Date               |
| Comments:  |                      |  |                    |
| <b>Faculty Association Graduate Committee</b>                        |                      |  |                    |
| <input type="checkbox"/> Recommended                                 |                      |  |                    |
| <input type="checkbox"/> Not Recommended                             |                      | Faculty Association Graduate Chair               | Date               |
| Comments:  |                      |  |                    |
| <b>Graduate Dean</b>   |                      |  |                    |
| <input type="checkbox"/> Recommended                                 |                      |  |                    |
| <input type="checkbox"/> Not Recommended                             |                      | Graduate Dean                                    | Date               |
| Comments:  |                      |  |                    |
| <b>Academic Affairs Council</b>                                      |                      |  |                    |
| <input checked="" type="checkbox"/> Recommended                      | (Category/ies _____) | <u>[Signature]</u>                               | <u>12/17/07</u>    |
| <input type="checkbox"/> Not Recommended                             | (Category/ies _____) | Assistant Vice President                         | Date               |
| Comments:  |                      |  |                    |
| <b>Senior Vice President and Vice President for Academic Affairs</b> |                      |  |                    |
| <input checked="" type="checkbox"/> Approved                         | (Category/ies _____) | <u>[Signature]</u>                               | <u>12/18/07</u>    |
| <input type="checkbox"/> Not Approved                                | (Category/ies _____) | Sr. Vice President / Vice Pres. Academic Affairs | Date               |
| Comments:  |                      |  |                    |

## PHYS 222 (3cr)      General Physics II

### Rationale:

We propose to change the General Physics sequence from the current two semester sequence [5cr + 5cr] to a three semester one [4cr + (3+1)cr + (3+1)cr]. We believe the current two semester sequence gives students too much material in a short time. By making this change, we hope to accomplish the following:

1. Give students more time to absorb the material.
2. Improve student retention rate and understanding of physics.

This is the second course in the proposed General Physics series. The laboratory is separated from the lecture in order to give students options to take the course with or without the laboratory.

### Catalog Course Description:

Designed for science and engineering students. Calculus-based physics. Covers electrical charge and field; magnetic field and its sources; current and resistance; simple DC and AC circuits; and electromagnetic induction. Lecture only. (Associated laboratory course is PHYS 232.)

Pre: MATH 122 with a "C" or better; and PHYS 221 with a "C" or better.

Fall, Spring.

### Course Objectives:

To learn the basic physics concepts and laws of electricity and magnetism.

To understand these concepts and to be able to use the basic equations of electricity and magnetism to solve physics problems involving charge, current, electric and magnetic fields.

### Learning outcomes:

To understand the nature of electric charges, conductors, and insulators.

To understand Coulomb's Law, and to be able to calculate the forces between static electric charges.

To understand the definition of electric field, and to be able to calculate the electric field caused by a charge distribution.

To understand electric potential and capacitance.

To understand electric current and sources of resistance to electric current.

To be able to use Ohm's Law to calculate the resistance of a given conductor.

To learn Kirchhoff's Rules, and to be able to use the rules to solve simple DC circuit problems.

To understand the definition of magnetic field, and how a magnetic field interacts with charges and currents.

To be able to calculate the magnetic field caused by a current or by a moving charge.

To understand electromagnetic induction and inductance.

To understand alternating currents, electromagnetic oscillation, and impedance in an AC circuit.

To know the different kinds of magnetic materials.

To learn Maxwell's equations.

**Staffing plan:**

Offering this course has minor effects on the department's staffing plan. With careful planning, offering this course should not increase the load of the faculty presently in the department.

**Resources required:** No new resources are required.

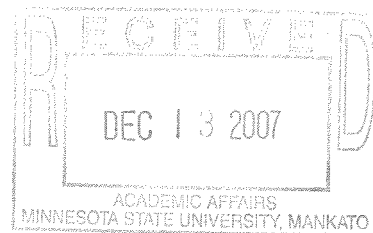
| <u>Topics</u>                      | <u>Chapters</u> | <u>Proposed Lectures</u> | <u>Current Lectures</u> |
|------------------------------------|-----------------|--------------------------|-------------------------|
| Electric charge and fields         | 3               | 9                        | 8                       |
| Electric potential and capacitance | 2               | 7                        | 7                       |
| Current and resistance             | 1               | 3                        | 3                       |
| Simple DC circuit                  | 1               | 3                        | 3                       |
| Magnetic field and its sources     | 2               | 7                        | 7                       |
| Electromagnetic induction          | 1               | 5-6                      | 5-6                     |
| Simple AC circuit                  | 1               | 1                        | 1                       |
| Magnetic materials                 | 1               | 1-2                      | 1-2                     |
| Maxwell's equations                | 1               | 2                        | 1-2                     |
| Mechanical and sound waves         | 2               | 0                        | 7-8                     |
| Electromagnetic waves              | 1               | 0                        | 2                       |
| Interference and diffraction*      | 2               | 0                        | 3-7                     |
| Geometric optics*                  | 2               | 0                        | 3-7                     |
| Total possible lectures            |                 | 38-40                    | 51-63                   |
| In class tests                     |                 | 3-4                      | 3-4                     |
| Total allowed classes              |                 | 42-44                    | 56-59                   |

\* Coverage with flexibility

Class meets three 50-minute periods a week for lecture. Students' learning outcomes are assessed by homework and tests.

To: UCAP Committee members  
From: Youwen Xu, Chair, CSET Curriculum Committee *J. Xu*  
Date: Oct. 26, 2007  
Subject: Endorsement for the proposed new General Physics course sequence

The endorsements for the proposed new General Physics course series (Phys 221, 222, 223, 232, and 233) from departments and programs that are affected by the changes are attached with the proposal of Phys 221. Please note that the endorsements are for the whole sequence, not just for one course.



December 11, 2007

Memo to: Brenda L. Flannery, Ph.D.  
Assistant Vice President for Undergraduate Studies and International Education  
Academic Affairs, 315 Wigley Administration Center

David S. Gjerde, Registrar  
Office of the Registrar, 132 Wigley Administration Center

From: Mark A. Pickar, Chair, Department of Physics and Astronomy

Re: Addendum to the Fall, 2008 Schedule for PHYS 222

Dear Dr. Flannery and Mr. Gjerde:

On behalf of my department, I would like to request an addendum to the Fall, 2008 schedule. I would like to have allowed the offering of PHYS 222 as a 5 credit course (as described in the 2007-2008 Undergraduate Bulletin) during the Fall, 2008 semester so that students who start the old General Physics sequence in the Spring, 2008 semester will have the opportunity to finish that sequence in Fall, 2008. The addendum would only be for Fall, 2008. The new General Physics sequence would be in full effect in Spring, 2009.

To help inform students of this, I will have notices describing the upcoming transition distributed to students taking both PHYS 221 and PHYS 222 this Spring, 2008. I will also have notes pointing out the transition included in the web-posted schedules for both PHYS 221 and PHYS 222 for Fall, 2008.

Please let me know of anything I can do to assist you in this matter.

Sincerely,

A handwritten signature in cursive script that reads "Mark A. Pickar".

Mark A. Pickar, Chair  
Department of Physics and Astronomy  
Minnesota State University, Mankato

Cc: John Frey, Dean, CSET  
David Haglin, Associate Dean, CSET  
Angie Bomier, Student Relations Coordinator, CSET  
Cindy Flitter, Administrative Assistant, Dept. of Physics and Astronomy