

# UNIVERSITY PHYSICS I

*PHYS 211*

*FALL SEMESTER 2008*

(3-0) 3 credits. Prerequisites: MATH 123 or permission of instructor. This is a first course in a two (2) semester calculus-level sequence, covering fundamental concepts of physics. This is the preferred sequence for student majoring in physical science and engineering. Topics include classical mechanics and thermodynamics. **SDSM&T course covers classical mechanics only.** Credit will not be allowed in both Phys 111-113 and Phys 211-213.

**Textbook:** *Fundamentals of Physics, Part I*, Halliday, Resnick, Walker, 8<sup>th</sup> Edition w/WileyPlus supplement

**Homework website URL:** <http://edugen.wiley.com/edugen/class/cls73995/>

**Class Meetings:** M, W, 11:00a.m., C 228

**Course Instructor:** Dr. R. Corey, 394-2362 (office), [robert.corey@sdsmt.edu](mailto:robert.corey@sdsmt.edu)  
<http://sdmines.sdsmt.edu/sdsmt/directory/personnel/rcorey>

**Office:** EEP 218

**Office Hours:** M, W 1:00 – 2:30 p.m.

Students may make appointments at times other than office hours.

Students with special needs or requiring special accommodations should contact Dr. R. Corey at 394-2362 and/or the campus ADA coordinator, Ms. Jolie McCoy, at 394-1924 at the **earliest** opportunity.

The final grade for the course will be based on the following **LETTER GRADE**

		A	≥ 85%
3 Hour Exams	300	B	84 - 70%
Instructor's Evaluation*	150	C	69 - 55%
Final Exam	<u>150</u>	D	54 - 50%
TOTAL	600	F	< 50%

\*The Instructor's Evaluation will be based on homework and quizzes.

Quizzes will not be announced beforehand and may be given in both lecture and recitation periods. Students are responsible for taking the exams when scheduled. Anyone missing an exam without prior approval and arrangement with Dr. Corey, or certifiable medical reasons, will be assigned a zero grade for the exam in question. The Final Exam will be a comprehensive exam on topics, which have received emphasis. Everyone must take the final exam.

The hour exams will cover the following material (subject to revision):

HOUR EXAM	CHAPTERS	DATE	TIME
EXAM I	2 - 4	Tuesday, Sept. 30	11:00 a.m.
EXAM II	5 - 7	Tuesday, Oct. 28	11:00 a.m.
EXAM III	7 - 9	Tuesday, Nov. 25	11:00 a.m.

**NOTE:** All one-hour exams will be held in rooms EEP 208, 252, 253, 254, 251A and 251B at 11:00 a.m. on Tuesdays.

The final exam will be held on Friday, Dec. 19, 7:00-8:50 a.m., in room C228.

## Policies:

- **Internet access is required for this course. All homework will be completed and graded on-line.**
- **Registration on the homework website is required. Go to <http://edugen.wiley.com/edugen/class/cls73995/>, (select “bookmark this page” if you are registering on your own computer) and follow the instructions to register for the class.**
- The recitation sections are an important integral component of the class. Recitation gives students the opportunity to receive assistance on homework. Exams will be returned and quizzes may be given during recitation sections.
- Students are responsible for taking the exams when scheduled. **Anyone missing an exam without prior approval and arrangement (this includes leaving a phone or email message with the professor or the physics department secretary) or certified medical reasons will be assigned a grade of zero for the exam in question.**
- **All exams, including the final, are open book. Only the standard course textbook is allowed. Student prepared note cards and sheets are not permitted. Calculators are permitted and recommended for exams.**
- The Final Exam will be a comprehensive exam on topics which have received emphasis. **Everyone must take the final exam.**
- **Final Exam date, time, and location: Friday, Dec. 19, 7:00 to 8:50 AM, C 228.**
- Any violation of the **SDSM&T Academic Integrity Policy**, such as cheating or plagiarism, will not be tolerated. Penalties may range from a failing grade (zero) for the work in question to failure in the course.

## TENTATIVE SCHEDULE

WEEK OF	MONDAY	WEDNESDAY
September 1 - 5	<b>Holiday</b>	Chapter 2
September 8 - 12	Chapter 2	Chapter 2
September 15 – 19	Chapter 3	Chapter 4
September 22 – 26	Chapter 4	Chapter 4
September 29 – October 3 <b>(Sept. 30, Exam # 1)</b>	Chapter 4	Chapter 5
October 6 – 10	Chapter 5	Chapter 5
October 13 – 17	<b>Holiday</b>	Chapter 6
October 20 – 24	Chapter 6	Chapter 6
October 27 – 31 <b>(Oct. 28, Exam # 2)</b>	Chapter 7	Chapter 7
November 3 - 7	Chapter 8	Chapter 8
November 10 – 14	Chapter 8	Chapter 8
November 17 - 21	Chapter 9	Chapter 9
November 24 – 28 <b>(Nov. 25, Exam # 3)</b>	Chapter 9	Chapter 9
December 1 – 5	Chapter 10	Chapter 10
December 8 – 12	Chapter 10	Chapter 10

## Course objectives

1. To present the basic concepts and principles of mechanics;

2. To strengthen an understanding of the concepts and principles through a broad range of interesting applications in the real world.

To meet these objectives, emphasis is placed on sound physical arguments and problem-solving methodology.

**Upon completion of this course, students should demonstrate the ability to:**

1. Use SI units and convert units from one system to another.
2. Perform basic operations on vectors such as adding and subtracting vectors geometrically and by components in the unit-vector notation; converting components into polar coordinates; multiplying a vector by a scalar and performing the dot and cross multiplication of vectors.
3. Calculate displacement, average and instantaneous velocity and acceleration of a particle given its position vector; describe projectile motion and uniform circular motion; relate velocities in different frames of reference.
4. Use the free-body diagrams in solving dynamics problems; apply Newton's laws to a system of several interacting bodies in order to find their accelerations.
5. Calculate work done by a constant or general variable force; calculate power given the force and instant velocity; use the work-energy theorem to relate a change in kinetic energy to the net work done on a system.
6. Calculate gravitational and elastic potential energy; apply energy conservation principles to systems involving gravity, springs, and friction.
7. Find the center of mass of a system of several particles; apply Newton's second law to a system of particles in order to relate the net external force and the acceleration of the system's center of mass.
8. Use conservation of linear momentum and of energy to relate velocities of colliding bodies before and after collision for the cases of elastic and purely inelastic collisions in one and two dimensions.
9. Calculate angular displacement, velocity and acceleration; relate angular and linear variables; calculate rotational kinetic energy; use the parallel-axis theorem to find the rotational inertia of a body; calculate torque; apply the Newton's second law in angular form to relate the net torque and the angular acceleration.

GenEd Goal #6: *Students will understand the fundamental principles of the natural sciences and apply scientific methods of inquiry to investigate the natural world.*

**Student Learning Outcomes:** As a result of taking courses meeting this goal, students will:

1. Demonstrate the scientific method in a laboratory experience. This outcome will be achieved and assessed in Phys 213L course.
2. Gather and critically evaluate data using scientific method.  
**Assessment:** Students will be able to critically evaluate data (given or obtained) with proper accuracy using appropriate laws and formulas of classical mechanics for scientifically sound presentation of laboratory reports, homework assignments, and of solutions on quizzes and exams.
3. Identify and explain the basic concepts, terminology and theories of selected natural sciences.  
**Assessment:** Students will be able to identify and apply basic concepts and appropriate laws of classical mechanics in order to solve assigned problems in homework, quizzes, exams, and in oral presentation.
4. Apply selected natural science concepts and theories to contemporary issues.

**Assessment:** Students will be able to explain how physics concepts, laws, and phenomena relate to contemporary engineering and science in classroom discussions and written assignments.

**Freedom in learning.** Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the dean of the college which offers the class to initiate a review of the evaluation.