

SYLLABUS

Catalog course description: (3-0) 3 credits. This course is the second course in a two (2) semester calculus-level sequence, covering fundamental concepts of physics. This is the preferred sequence for students majoring in physical science or engineering. Topics include electricity and magnetism, sound, light, and optics. **SDSM&T course covers electricity and magnetism only.**

Textbook: **Fundamentals of Physics**, D. Halliday, R. Resnick, J. Walker, 8th Ed. Part 3
Class Time and Location: **Monday, Wednesday 11:00 – 11:50 AM, in EEP 252**
Course Instructor: Dr. Vladimir Sobolev
Office, office hours: 222 EEP; M, W, 3:00 – 6:00 PM; T, Th 1:00 – 4:00 PM
Phone, E-mail: 394-1225; Vladimir.Sobolev@sdsmt.edu

Course Web site: <http://www.hpcnet.org/sdsmt/directory/courses/2009fa/phys213/213AM001>

Prerequisites: PHYS 211.

!! Internet access is required for this course. All homework must be completed and will be graded on-line. Registration on the homework website is required. Copy the URL

<http://edugen.wiley.com/edugen/class/cls125953/> into the address line of you browser and immediately bookmark the login page, then select “Register”.

NOTE: *Students with special needs or requiring special accommodations should contact the instructor, Dr. V. Sobolev, and/or the campus ADA coordinator, Jollie McCoy, at 394-1924 at the earliest opportunity.*

Grade Structure:

	Points		Grade	%
3 Hour Exams (<i>and Take Home Tests</i>)	225		A	85 – 100
Homework/Quiz*	175		B	84 – 70
Final Exam	150		C	69 – 55
TOTAL	550 ↔ 100 %		D	54 – 50
			F	49 – →

HOUR EXAM	DATE	TIME	PLACE
EXAM I	Friday, September 25	11:00 a.m.	EEP 252
EXAM II	Friday, October 23	11:00 a.m.	EEP 252
EXAM III	Friday, November 20	11:00 a.m.	EEP 252

All hour exams will be held in the room 252 at 11:00 AM

*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. Sobolev, or certifiable medical reasons, will be assigned a zero grade for the exam in question.* Take home tests and quizzes *will not be announced beforehand* and will be given during the lecture class. *Attendance of lectures is compulsory. Nonattendance of lecture classes will lead to significant reduction of the final grade.* The Final Exam will be a comprehensive exam on topics, which have received emphasis.

Everyone must take the final exam.

Course Philosophy:

The idea of this course is to offer a logical presentation of the basic concepts and principles of electricity and magnetism, and to strengthen an understanding of concepts and principles through a broad range of applications to the real world. To meet this goal, the emphasis is placed on sound physical arguments, problem solving methodology as well as numerous examples of use of electricity and magnetism principles in contemporary technology, physical science and other disciplines, including engineering, chemistry, and medicine will be presented.

Students successfully completed this course will be able to:

- use SI units for electric and magnetic physical quantities; know non-system units used in electricity and magnetism;
- understand the basic concepts and laws of classical electrostatics and electrodynamics;
- quantitatively describe the forces between point charges; know major application of electrostatics and electrodynamics in modern technology;
- calculate the electric fields and electric potentials due to point charges and simple continuous charge distributions;
- understand the notions of capacitance and resistance, to find equivalent capacitances and resistances for capacitors and resistors connected in series and in parallel; know major application of capacitors and resistors in electric circuits;
- to apply the Kirchhoff's laws for calculations of multi-loop circuits;
- understand the phenomena taking place in circuits contain resistor and capacitor and how these phenomena are described by corresponding equations;
- calculate magnetic fields due to electric currents;
- understand the laws of motion of charged particles in uniform electric and magnetic fields or combined electric and magnetic fields and applications of these phenomena in modern science and technology;
- understand the laws of electromagnetic induction and their role in modern technology;
- improve ability to use mathematics and problem solving skills

Students are expected to spend a minimum of six hours per week studying for every three hours spent in class. Students who spend the minimum time studying usually get the minimum grade.

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. Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to

judgment of their personal opinion or conduct should contact the dean of the college which offers the class to initiate a review of the evaluation.

POLICIES

- The Recitation section is an integral component of the course. Students should attempt to work all assigned problems prior to a recitation so that they may obtain assistance on specific difficulties during the recitation. Attendance at recitation is very important.
- During each recitation, either a quiz will be given or homework will be graded. **All homework must be completed and will be graded on-line.** The quiz or homework will be graded for your weekly recitation score. **No makeup quizzes will be given; no late homework will be accepted.**
- Quizzes will be open book, **they will not be announced beforehand.** Occasionally, the quiz will be selected from the assigned homework problems.
- Normally, all hour exams and quizzes will be returned in your recitation section.
- Hour exams will be a combination of problems and multiple-choice questions. The final exam will be multiple choice only.
- **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.**
- **All hour exams will be held on Tuesday mornings at 11:00 AM in the rooms EEP 208, 251A and 251B, 252, 253, 254,.**
- One-hour exam regular-problem solution should contain:
 - Statement of what is given;
 - Statement of what is to be found;
 - The solution with appropriate equations, pictures and graphs;
 - The necessary steps to show how the problem is solved;
 - If it is a numerical answer, it should be marked with appropriate units, usually to 3 significant numbers.
- There will be considerable grade reduction if any of the above elements are missing in a solution.
- **The final exam will be comprehensive with some emphasis on material covered after Exam III.**

Appeals for additional credit on exam problems:

Exam grades are determined by assigning credit based on the merit of the solution given. If you feel you should receive more points for a particular solution please use the following procedure.

1. **Do not talk to the TA about it, talk to the instructor and submit.**
 - a) Your original test.
 - b) A complete and correct solution of the problem in question.
 - c) A brief description of why you think you deserve more credit for the solution on your exam.
3. See the professor one or two days after submission for return of your materials.
4. **Appeals must be submitted within 10 working days after the graded exam is returned. There will be no second appeals.**

Academic misconduct: Any violation of academic integrity policy, such as cheating and plagiarism, will not be tolerated in this course. Penalties may range from a failing grade for the work in question to failure of the course.

TENTATIVE LECTURE TOPIC SCHEDULE

WEEK OF	MONDAY	WEDNESDAY	FRIDAY
August 31– September 4		Introduction, Chapter 21	Chapter 21
September 7 – 11	Holiday	Chapter 21, 22	Chapter 22
September 14 – 18	Chapter 22	Chapters 22	Chapters 22
September 21 – 25 (Sept. 25 – Exam I)	Chapter 23	Chapter 23	Exam
September 28 – October 2	Chapter 23	Chapter 23	Chapter 24
October 5 – 9	Chapter 24	Chapter 24	Chapter 24

October 6 – 9	Chapter 25	Chapter 25	Chapter 25
October 12 – 16	<i>Holiday</i>	Chapter 25	Chapter 25, 26
October 19 – 23 (Oct. 23 – Exam II)	Chapters 26	Chapters 26	<i>Exam</i>
October 26 – 30	Chapter 26	Chapter 26	Chapter 27
November 2 – 6	Chapter 27	Chapter 27	Chapter 27
November 9 – 13	Chapter 27, 28	<i>Holiday</i>	Chapter 28
November 16 – 20 (Nov. 20 – Exam III)	Chapter 28	Chapter 28	<i>Exam</i>
November 23 – 27	Chapter 28	Chapter 29	<i>Holiday</i>
November 30 – December 4	Chapter 29	Chapter 29	Chapter 29, 30
December 7 – 11	Chapter 30	Chapter 30	Chapter 30
December 14 – 18 (<i>Final exams week</i>)	Final exam: December 17, 10.00 - 11:50 a.m. in EEP 252		

HOMEWORK ASSIGNMENTS

Chapter 21:	Questions: 4, 5, 6, 8, 10 Problems: 6, 7, 9, 10, 11, 12, 15, 17, 21, 23, 24, 25, 26, 27, 31, 32, 37, 42, 43, 46, 54, 55, 59, 62, 66
Chapter 22:	Questions: 2, 4, 6, 7, 9, 11 Problems: 10, 12, 13, 15, 18, 22, 23, 24, 25, 26, 29, 30, 32, 34, 35, 36, 40, 41, 42, 43, 47, 48, 56, 57, 58
Chapter 23:	Questions: 1, 3, 5, 6, 7, 8 Problems: 4, 5, 7, 9, 11, 12, 13, 14, 17, 19, 20, 21, 23, 25, 26, 27, 29, 30, 34, 35, 36, 37, 39, 41, 40, 45, 48, 50
Chapter 24:	Questions: 2, 4, 5, 6, 9 Problems: 6, 7, 8, 11, 15, 17, 19, 20, 21, 22, 23, 24, 25, 29, 31, 35, 36, 39, 41, 44, 45, 46, 48, 53, 62, 63, 64
Chapter 25:	Questions: 1, 3, 4, 5, 9, 10 Problems: 7, 9, 10, 12, 13, 14, 15, 16, 19, 23, 25, 26, 27, 29, 31, 34, 36, 39, 40, 41, 43, 45, 46, 47, 68
Chapter 26:	Questions: 1, 3, 4, 5, 7, 8 Problems: 5, 7, 8, 12, 13, 15, 17, 18, 20, 21, 22, 23, 24, 27, 29, 31, 32, 33, 36, 39, 41, 44, 47, 48, 52, 55
Chapter 27:	Questions: 1, 2, 3, 4, 7, 9, 10 Problems: 6, 8, 12, 13, 15, 18, 19, 20, 25, 26, 29, 31, 32, 35, 38, 45, 41, 49, 51, 53, 57, 59, 62, 63, 64, 69
Chapter 28:	Questions: 1, 2, 3, 5, 6, 8 Problems: 8, 9, 10, 11, 13, 15, 19, 21, 22, 25, 26, 27, 28, 30, 31, 36, 38, 41, 42, 44, 48, 50, 55, 57, 60, 61, 62
Chapter 29:	Questions: 1, 2, 4, 6, 7, 8, 11 Problems: 6, 7, 8, 13, 14, 15, 16, 19, 20, 24, 26, 27, 36, 37, 38, 41, 42, 45, 46, 48, 49, 51, 52, 57, 58, 59
Chapter 30:	Questions: 1, 2, 3, 4, 6, 8, 10 Problems: 9, 10, 13, 14, 15, 16, 17, 22, 23, 29, 31, 32, 34, 37, 38, 39, 42, 43, 51, 52, 56, 58, 61, 63, 64, 68, 71
Chapter 31:	Questions: 1, 3, 4, 5, 7, 9, 11 Problems: 3, 5, 7, 9, 10, 11, 12, 13, 14, 16, 18, 21, 24, 25, 27, 29, 30, 32, 34, 37, 41, 44, 51, 54, 56, 59, 61, 63