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PHSX 217N.01: Fundamentals of Physics with Calculus II

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Physics 217 Fundamentals of Physics with Calculus II Spring 2014

Instructor:	Dan Reisenfeld
Office:	CHCB Office 126 (inside the department office suite)
Phone:	243-6423
Text:	<i>Fundamentals of Physics</i> , Halliday and Resnick 10e with WileyPlus Access Purchase <i>iclicker</i> and bring it to class every day
Optional Text:	<i>Quick Calculus</i> , Ramsey and Kleppner 2e.
Lecture:	M, T, W, Th, 1:10 – 2:00 PM. CHCB Room 131.
Office Hours:	M 11:10 am – 12:00 pm, W 2:10 – 4:00 pm, Th 2:10 – 3:00 pm
Course Website:	http://edugen.wileyplus.com/edugen/class/cls377583/

Homework: 7-10 problems per chapter will be assigned through the WileyPlus course page. Complete solutions to these problems will be provided online after the due date of the assignment. **No late homework** will be accepted but you will be able to drop your lowest 10 question scores. In addition, further problems and solutions will be posted for practice.

Exams: There will be 4 mid-term exams during the semester: three given on **Thursday evenings** from 6-8 PM and the fourth exam on a Tuesday evening, also from 6-8 PM (see schedule on page 2). The exams will be closed book except for a calculator and one 3×5 index card of notes that each student must prepare for her/himself prior to the exam. Solutions to the exams will be posted outside my office and available on the course web site. Make-up exams will be given only in extreme situations and must be arranged IN ADVANCE. Please do not miss any exams. The **final exam** is comprehensive and will be held on Wednesday May 14th, from 1:10pm to 3:10pm.

Participation/Attendance: Several questions will be posed during each lecture to gauge student understanding of the topics being discussed and answers will be supplied using your *iclicker*. Some credit will be given for participation in this process and additional credit will be given for correct answers to these questions. For those students who have an *iclicker* from the first semester of this course, your *iclicker* registration will stay in place. For those that do not, please purchase and use your *iclicker* in class, then go to the registration page at: www.iclicker.com to register your *iclicker*. (See HW assignment 1).

Laboratory: Each student must also register for PHSX 218, a separate 1- credit hour laboratory course that meets once a week. The exception is if a student has taken PHSX 218 in a previous year and wishes to keep her/his original grade. Lab sections are held W and Th, 3:10 – 5:00 pm in room CHCB 229.

General Remarks: This will be an intensive course; we will cover 19 chapters in 14 weeks. Be sure to keep up on reading assignments and problem assignments. This course can be taken for a traditional letter grade only. **Drop/Add** can be performed online until **February 14th**, and with the instructor's and advisor's signatures until **April 7th**. No drop petitions will be signed after this date without written verification of extreme circumstances. Prerequisites to this course are PHSX 215/216 and M171 (Calculus I). Co-requisites to this course are M172 (Calculus II), and PHSX 218 (Physics Laboratory) or equivalents.

Grading:

Mid-term Exams:	40%
Homework:	20%
Participation/Attendance:	10%
Final Exam:	30%

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://life.umt.edu/VPSA/name/StudentConductCode>.

Students with disabilities will receive reasonable modifications in this course. Your responsibilities are to request them from me with sufficient advance notice, and to be prepared to provide verification of disability and its impact from Disability Services for Students. Please speak with me after class or during my office hours to discuss the details. For more information, visit the Disability Services for Students website at <http://www.umt.edu/disability>.

Physics 217 – Course Schedule

Week	Chapters	Topics	Notes	Exams
Week 1 1/27 – 1/30	Chp. 18, Chp. 19	Temperature, heat & work, kinetic theory, ideal gas		
Week 2 2/3 – 2/6	Chp. 20	Entropy, 2 nd Law, engines, pV diagrams	Begin <i>iclicker</i> work for credit	
Week 3 2/10 – 2/13	Chp. 21, Chp. 22	Electric force, electric field		
Week 4 2/18 – 2/20	Chp. 22, Chp. 23	Electric field and flux, Gauss' Law	No Class Monday	Exam 1: 6-8 pm Thurs. Feb. 20
Week 5 2/24 – 2/27	Chp. 24, Chp. 25	Electric potential, capacitance		
Week 6 3/3 – 3/6	Chp. 25, Chp. 26	Capacitors, electric current & resistance		
Week 7 3/10 – 3/13	Chp. 26, Chp. 27	Electric power, simple circuits		
Week 8 3/17 – 3/20	Chp. 28, Chp. 29	Magnetic field, magnetic force		Exam 2: 6-8 pm Thurs. March 20
Week 9 3/24 – 3/27	Chp. 29, Chp. 30	Faraday's Law, Lenz's Law		
3/31 – 4/3			<i>Spring Break</i>	
Week 10 4/7 – 4/10	Chp. 30, Chp. 31	Circuits, AC current, transformers		
Week 11 4/14 – 4/17	Chp. 32, Chp. 33	EM spectrum, EM waves, reflection & refraction		Exam 3: 6-8 pm Thurs. April 17
Week 12 4/21 – 4/24	Chp. 34, Chp. 35	Image formation, interference		
Week 13 4/28 – 5/1	Chp. 35, Chp. 36	Thin slit interference, diffraction		
Week 14 5/5 – 5/8	Chp. 36	Diffraction gratings, Review		Exam 4: 6-8 pm Tues. May 6
Finals Week 5/14		Finals Week		Final Exam Wed. May 14 1:10 – 3:10 pm

LEARNING OUTCOMES:

The overarching objectives of this course are to enable the student to:

1. Demonstrate a comprehension of the physical world by understanding how fundamental physical principles underlie the huge variety of natural phenomena and their interconnectedness.
2. Build critical thinking and quantitative skills by gaining insight into the thought processes of physical approximation and physical modeling, and by practicing the appropriate application of mathematics and calculus to the description of physical reality.
3. Comprehend the physical interpretation of mathematical results.

SPECIFIC LEARNING OUTCOMES:

At the end of this course, students will:

- (1) Understand basic calorimetry and phase transformation;
- (2) Be familiar with entropy and understand its role in limiting engine efficiency;
- (3) Be able to perform Coulomb's Law calculations;
- (4) Understand the differences between electric field and electric potential;
- (5) Be able to apply Gauss' Law to determine electric fields;
- (6) Perform simple electric circuit analysis;
- (7) Be able to determine magnetic forces and fields in simple geometries;
- (8) Be able to apply Lenz' Law and Faraday's Law;
- (9) Be familiar with the EM spectrum;
- (10) Grasp the basics of geometrical optics;
- (11) Develop an understanding of interference; and
- (12) Understand optical diffraction and the limitations it places on optical instruments.