Spring 2-1-2016

PHSX 217N.01: Fund of Physics w/Calc II

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Physics 217 Fundamentals of Physics with Calculus II Fall 2016

Overview:

Instructor:	Dan Reisenfeld
Office:	CH Clapp Bldg. Office 121
Phone:	243-6423
Text:	*Fundamentals of Physics*, Halliday and Resnick 10e with WileyPlus Access Purchase *iclicker* and bring it to class every day
Optional Text:	*Quick Calculus*, Ramsey and Kleppner 2e
Lecture:	M, T, W, Th, 1:10 – 2:00 PM. CHCB Room 131
Office Hours:	We will figure out my office hours (4 a week) during the first week.
Course Website:	Moodle. https://moodle.umt.edu
Homework Site:	WileyPLUS http:// www.wileyplus.com/class/499504

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

Exams:
There will be 4 mid-term exams during the semester: given on Tuesday evenings from 6-8 PM. Since each new topic will build on all previous concepts, a general working knowledge of previous material will be expected on all exams. 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 on the Moodle course website. 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 Tuesday May 10th, from 3:20 pm to 5:20 pm.

Participation/Attendance:
Several questions will be posed during most lectures 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.

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 12th**, and with the instructor's and advisor's signatures until **March 28th**. 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:
This course can only be taken for a traditional grade (A,A-,B+, etc.), and cannot be taken Credit/No Credit.

Mid-term Exams:	40%
Homework:	25%
Participation/Attendance:	10%
Final Exam:	25%

Physics 217 Weekly Schedule, Spring 2016

Week	Chapters	Topics	Notes	Exams
Week 1 1/25 – 1/28	Chp. 18	Temperature, Heat & Work, 1st Law of Thermo.		
Week 2 2/1 – 2/4	Chp. 19	Kinetic Theory, Ideal Gases	Begin *iclicker* work for credit	
Week 3 2/8 – 2/11	Chp. 20, Chp. 21	Entropy, 2nd Law, Electric Force		
Week 4 2/16 – 2/18	Chp. 21, Chp. 22	Electric Field and Flux	No Class Monday	Exam 1: 6-8 pm Tues. Feb. 16
Week 5 2/22 – 2/25	Chp. 22, Chp. 23	Fields from Charge Distributions, Gauss' Law		
Week 6 2/29 – 3/3	Chp. 24, Chp. 25	Electric potential, Capacitance		
Week 7 3/7 – 3/10	Chp. 26, Chp. 27	Current & Resistance, Simple Circuits		
Week 8 3/14 – 3/17	Chp. 27, Chp. 28	RC Circuits, Magnetic Fields & Forces		Exam 2: 6-8 pm Tues. March 15
Week 9 3/21 – 3/24	Chp. 29	Magnetic Fields from currents, Ampere's Law		
Week 10 2/28 – 3/30	Chp. 30	Faraday's Law, Lenz's Law		
Week 11 4/4 – 4/7	*Spring Break*			
Week 12 4/11 – 4/14	Chp. 31, Chp. 32	AC current, Transformers, Maxwell's Equations		Exam 3: 6-8 pm Tues. April 12
Week 13 4/18 – 4/21	Chp. 33, Chp. 34	EM waves, Reflection & Refraction, Mirrors		
Week 14 4/25 – 4/28	Chp. 34, Chp. 35	Lenses, Interference		
Week 15 5/2 – 5/5	Chp. 36	Diffraction Review		Exam 4: 6-8 pm Tues. May 3
Finals Week 5/10	Final Exam: Tuesday May 10, 3:20 – 5:20 pm			

Student Conduct Code

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://www.umt.edu/vpsa/policies/student_conduct.php

Disability Modification

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

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.