Physics 42  Electromagnetism and Modern Physics

General description:
The materials in this class include electricity, magnetism, optics and modern physics.

Prerequisites:  Successful completion of Physics 31 and Math 22.

WebCT URL:  http://webct.uvm.edu:8900/SCRIPT/phys042jy/scripts/serve_home

Textbook:  Physics with Modern Physics for Scientists and Engineers, 3rd Ed.

Accompanying Lab:  Physics 22.

Instructor:
Jie Yang
Cook Building, A525
Phone: 656-0061; email: jyang@zoo.uvm.edu.
Office Hour:  Th 2:00 - 3:30 PM; F 10:00 - 11:00 AM; 1:30 – 3:00 PM.

Course Hours:
Lecture:            11:15 – 12:05,  MWF
Recitation:          A:    9:30 – 10:45,  T (R. Headrick)
                    C:    11:00 – 12:15,  T (J. Yang)
                    B:    2:00 – 3:15,  T (K. Spartalian)

Recitation:
Recitations are to clarify some basic concepts and to help you to remove difficulties on some
assigned questions and problems.  A quiz will be given in most recitation sections.

Quizzes & Exams
All quizzes and exams are based on homework assignments.  There are two 50-min exams and a
final exam, all close-book.  An equation sheet will be provided for each exam.  There will also be
on-line quizzes posted on the web (WebCT On-Line Work).  You are encouraged to work on
these on-line quizzes at your own convenience.  They will help your understanding of the course
materials and allow you to earn bonus grades.

No excuse for missing any 50-min exam except when a written notice with valid excuse is given
to the instructor well ahead of the scheduled exam. In case of an illness, a note from the
attending physician will be necessary.

No excuse at all for missing the final exam.  Anyone who misses the final exam
automatically fails the class no matter what the person has been doing in the
class!!
Reading:
You should read the materials in the textbook ahead of the class. This is necessary for you to follow the materials discussed in the classes.

Homework Assignments:
There are homework assignments for each chapter. You are expected to work all of them. The recitation sections will help you to remove difficulties in the assignments.

Grades:
For the course grade, each hour exam counts 20%, the recitation quizzes average counts 20%, and the final exam counts 40%.
The on-line quizzes average counts for a bonus 10%. These quizzes will be always post on line so you can attempt them to better understand the physics. However, only your first attempt will be graded and recorded.
Your maximum overall grade average is 110% because of the bonus 10%. If you course average is 80%, and bonus average is 70%, your final course average will be 87%.

Other:
University regulations concerning academic honesty apply to all work in this course. See the Cat's Tale for details.

Students who withdraw from Physics 42 must also withdraw from Physics 22.

Syllabus and course calendar

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Homework Assignments

**Chap. 23 Electric Charge, Force, and Field (8/26-8/30)**
Questions: 5, 7, 9, 10, 15, 17, 20.

**Chap. 24 Gauss's Law (9/4, 9/6)**
Questions: 1, 3, 5, 8, 10, 11, 15, 16, 18, 20, 21.
Problems: 4, 9, 11, 17, 26, 29, 31, 36, 48, 71, 75.

**Chap. 25 Electric Potential (9/9-9/13)**
Questions: 1, 2, 3, 5, 7, 9, 15, 18, 20.

**Chap. 26 Electrostatic Energy and Capacitors (9/16, 9/18)**
Questions: 2, 4, 7, 8, 10, 11, 14, 16, 17, 19, 22.
Problems: 12, 22, 23, 37, 47, 54, 68, 70, 81.
Chap. 27  Electric Current (9/20)
Questions: 1, 3, 4, 6, 7, 13, 15, 18.
Problems: 1, 2, 6, 17, 31, 36, 46, 72.

Chap. 28  Electric Circuits (9/23, 9/25)
Questions: 3, 6, 7, 8, 10, 11, 20, 25, 26, 27.
Problems: 1, 10, 26, 31, 34, 39, 45, 48, 50, 54, 56, 73.

Exam I, Friday, 9/27/02

Chap. 29  The Magnetic Field (9/30-10/4)
Questions: 1, 3, 7, 9, 11, 12, 13, 19, 21.
Problems: 3, 9, 22, 27, 31, 36, 38, 40, 41, 65.

Chap. 30  Sources of the Magnetic Field (10/7, 10/9)
Questions: 1, 2, 4, 7, 8, 11, 12, 14, 17, 18.
Problems: 1, 8, 12, 21, 24, 26, 28, 33, 36, 41, 48.

Chap. 31  Electromagnetic Induction (10/11-10/16)
Questions: 1, 2, 3, 6, 8, 12, 15, 18, 21, 23.
Problems: 2, 6, 17, 19, 30, 31, 38, 39, 49, 58.

Chap. 34  Maxwell's Equations and Electromagnetic Waves (10/21)
Questions: 3, 4, 7, 11, 13, 15, 17, 18.
Problems: 7, 8, 9, 15, 18, 21, 24, 29, 33, 39, 41.

Exam II, Wednesday, 10/23/02

Chap. 35  Reflection and Refraction (10/15, 10/28)
Questions: 2, 5, 6, 8, 9, 11, 15, 16.
Problems: 2, 7, 14, 18, 20, 26, 33, 34, 36, 60.

Chap. 36  Image Formation and Optical Instruments (10/30, 11/1)
Questions: 1, 4, 6, 8, 9, 11, 14, 17.
Problems: 2, 5, 6, 9, 19, 23, 28, 34, 45.

Chap. 37  Interference and Diffraction (11/4, 11/6)
Questions: 1, 3, 4, 5, 7, 8, 9, 11, 14.
Problems: 1, 3, 7, 12, 13, 18, 35, 41, 42, 44, 45, 55, 57.

Chap. 38  Relativity (11/8, 11/11)
Questions: 4, 7, 9, 11, 12, 14, 16.
Problems: 7, 8, 16, 17, 27, 28, 29, 33, 36.
Chap. 39  Light and Matter: Waves or Particles? (11/13, 11/15)
Questions: 2, 3, 4, 6, 7, 10, 11, 13, 15.

Chap. 40  Quantum Mechanics (11/18, 11/20)
Questions: 1, 3, 5, 7, 8, 9.
Problems: 1, 2, 4, 6, 10, 12.

Chap. 41  Atomic Physics (11/22, 11/25)
Questions: 1, 2, 5, 7, 10.
Problems: 2, 5, 15, 23.

Chap. 43  Nuclear Physics (12/2, 12/4)
Questions: 1, 3, 9, 10, 12, 17, 19, 20.
Problems: 16, 19, 24, 25, 28, 32, 36.

Final Exam, Tuesday, 12/10, 8:00 AM