# Physics 1302: Electricity and Magnetism
# Spring 2006

**Instructor Information:**

Mrs. B. Rasmussen
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Office Hours: TR 7 – 8 PM or by appointment
If no one shows up after 15 minutes I will feel free to do errands.

**TA Information: TBA**

**Class Times:**

Tuesday and Thursday, 5:30 – 6:45 pm,
FN2.102, January 10 – Apr 27
Final Exam will be 5 pm April 27
(please contact instructor as soon as possible about any conflicts)

**Text:**

Physics, 6th edition, by Cutnell & Johnson

**Prerequisite:**

1st semester College Physics (Phys 1301)

**Grading:**

Final grades are determined from a combination of homework, exams, and the final exam. There could be class projects also. **There will be no curving.**

| | | | |
|---|---|---|---|
| Homework/Quizzes/Attendance | 30% | 90-100 | A (A+, A, A-) |
| 2 Exams | 40% | 80-89.9 | B |
| Final Exam | 30% | 70-79.9 | C |
| TOTAL | 100% | 60-69.9 | D |
| | | Below 60 | F |

**Exams and Final Exam:**

**Valid picture ID must be on your desk during exams. These will be checked. Also calculators will be necessary** for all exams. **Graphing calculators and programmable calculators will not be allowed in the exams**. A little scientific calculator that has trig functions can be obtained very inexpensively and should be all that is used on the exams.

All exams will be **closed book**. **Formulas will be provided with the exam**. You must know the concepts and vocabulary for the exams. **Calculators will be necessary** for all exams. **Exams will cover both in-class examples and homework**. **Exams must be done in ink.**

The final exam will be **cumulative** and will be based on the exams, homework, and any new material. The final exam will have all rules of a regular exam still in effect.

During the exam periodic information will be given on the overhead like time updates and any clarifications necessary. A verbal warning of 10 minutes remaining will be given. When time is up I will request everyone to put their pens down and pass their exams to the right and leave to the left.

Exams will consist of a conceptual section and a problem section. You will be responsible for all the reading assignments even if we do not discuss them in class. You must **show all your work especially equations** for the problems. No partial credit will be given on the conceptual section, but there will be for the problems based on the work shown including equations.

Makeup exams will only be offered once at the end of the semester and only in the case of documented, extenuating circumstances. You can only make up one exam; so don't miss more than one.

Any question about an exam grade must be addressed by the next class day after handing out of the exam to the class. After that all grades are final.

**Any student involved in cheating will be reported to the Dean of Students**.

**Homework Problems and Quizzes:**

Homework assignments are given for each chapter on the website http://edugen.wiley.com/edugen/class/cls4843
Just go to the website and login as a student following the directions.

This homework **will** be graded. Late homework will be accepted but with a penalty. Do not get behind.

Please do not stop with the assigned homework problems, the more problems you do the better a grade you will get in the course. I strongly recommend looking at more problems at the end of the chapters. Also look at the questions at the end of the chapters.

There will be short reading quizzes at the beginning of each class based on the chapter going with the lecture material. They are graded and part of your final grade. Therefore you must **read the chapters before the lecture**. You can keep a physics notebook of facts and formulas that you can use on the quizzes.

You can also go to the course under WebCT and download part of the lectures. Be careful these lectures are not complete and will not be enough to pass the class. **Come to Class**.

## Class Objectives:

This is a list of what I expect you to know and be able to do by the end of this class.

1. Addition, scalar multiplication, and vector multiplication of vectors
2. Work force problems including the constant acceleration equations (including electric and magnetic forces)
3. Calculation of the electric field of a continuous charge distribution in both the symmetrical and unsymmetrical cases (including the electric field from an electric potential)
4. Calculation of the electric potential, capacitance, resistance, and current density (including electric potential from an electric field)
5. Calculation of equivalent capacitance, resistance, and inductance in electric circuits
6. Understanding what capacitance and resistance depend on
7. Calculation of capacitance, charge, and potential on all capacitors in a circuit
8. Calculation of resistance, current, and potential on all resistors in a circuit
9. Calculation of electric and magnetic flux
10. Understand the Hall effect
11. Calculation of magnetic field from all sources both symmetric and asymmetric
12. Calculation of induced emf
13. Calculation of self and mutual inductance
14. Calculation of energy stored in electric and magnetic fields
15. Understand electromagnetic waves and their spectrum
16. Understand reflection and refraction including focal point, magnification, and finding the image (mirrors and lenses)
17. Understand relativity and the paradoxes associated with it.
18. Understand the basics of radiation.

**Important Dates:**

Last day to add 1/13

Holiday 1/16
Spring Break 3/6 – 3/11

# Class Schedule

| Date | Lecture | Reading assignment |
|---|---|---|
| 1/10 T | L1 Charges | 18 |
| 1/12 | L2 Electric force & fields | 18 |
| 1/17 T | L3 Electric fields (Gauss's Law) | 18 |
| 1/19 | L4 Electric potential | 19 |
| 1/24 T | L5 Electric potential energy, capacitors | 19 |
| 1/26 | L6 Capacitor circuits | 19 |
| 1/31 T | L7 Dielectrics | 19 |
| 2/2 | L8 Current, batteries | 20 |
| 2/7 T | L9 Resistors, conductors | 20 |
| 2/9 | L10 Circuits | 20 |
| 2/14 T | L11 Circuits cont | 20 |
| 2/16 | L12 RC Circuits | 20 |
| 2/21 T | Exam 1 (18-20) | |
| 2/23 | L13 Magnetic fields & forces | 21 |
| 2/28 T | L14 Magnetic torque & crossed fields | 21 |
| 3/2 | L15 Biot Savart, Ampere | 21 |
| 3/6-11 | L16 Induction (Faraday & Lenz) | 22 |
| 3/14 T | L17 Inductance & inductors | 22 |
| 3/16 | Spring Break | |
| 3/21 T | L18 Inductance cont., magnetic materials | 22,21 |
| 3/23 | L19 Alternating Current | 23 |
| 3/28 T | Exam 2 (21-23) | |
| 3/30 | L20 Electromagnetic Waves | 24 |
| 4/4 T | L21 Optics | 25 |
| 4/6 | L22 Reflection-mirrors | 25 |
| 4/11 T | L23 Refraction-lens | 26 |
| 4/13 | L24 Optical Instruments | 26 |
| 4/18 T | L25 Radioactivity | 31 |
| 4/20 | Review | |
| 4/27 | Final @ 5 pm | |

T stands for a Tuesday.

**For the reading assignment please look at the lecture notes and read appropriate sections covered. The reading assignment also includes the lecture notes on WebCT.**

**There will be reading quizzes at the beginning of each class on the total reading assignment.**

Homework List Spring 06 Physics 1302

| Due date | Chapter | Problems | |
|---|---|---|---|
| 1/17 | 18 | 2,3,5,12,13,18,56,62 | 8 |
| 1/24 | 18<br>19 | 27,32,35,47,49,66<br>2,6,9,13,20 | 11 |
| 1/31 | 19 | 12,16,30,43,44,51,52 | 7 |
| 2/7 | 20 | 2,5,8,13,17,26,102 | 7 |
| 2/14 | 20 | 41,53,54,63,71,88,101,109,112 | 9 |
| 2/21 | 20 | 96,97,98,99 | 4 |
| 2/28 | 21 | 2,8,10,21,33,43,53,55,61 | 9 |
| 3/14 | 22 | 2,15,16,21,23,26,64,69 | 8 |
| 3/21 | 22<br>23 | 44,49,51<br>6,12,13,21,36,39 | 9 |
| 3/28 | 24 | 4,9,20,21,25,33,45 | 7 |
| 4/4 | 25<br>26 | 2,10,11,17,22,30,31,34<br>23,26,30 | 11 |
| 4/11 | 26 | 14,20,44,48,55,59,61,67,69 | 9 |
| 4/18 | 28 | 2,10,11,14,32,34,40 | 7 |