Department of Physics
University of Maryland

Physics 272 Syllabus

Spring 2003

Course Title: Introductory Physics: Fields

Prerequisite: PHYS 171 or PHYS 161) and MATH 141.

Corequisite: MATH 241

Course Description: Second semester of a calculus based general physics course. Universal gravitation, electric and magnetic fields and potentials, simple circuits and Maxwell's equations. Continues the application of mathematics to conceptual models, with more abstract components. Extensive use is made of algebra, trigonometry and vector calculus.

Course Wepage: Updates to the course can be found on-line at;

http://www.physics.umd.edu/courses/Phys272/index.html

Instructor: Sylvester James Gates, Jr., Room 4121 (Physics Building),
telephone: 301-405-6025,
electronic mail: GATESS@WAM.UMD.EDU
webpage: http://www.physics.umd.edu/ep/gates/gates.html

Textbook Required: E. Purcell, *Electricity & Magnetism*,
Second Ed., McGraw-Hill, Inc.
Textbook Recommended: H. M. Schey, *div, grad, curl & all that*,
Third Ed. W. W. Norton, Inc.

Lecture: Tuesday, Thursday, 12:30 - 1:45, Physics Bldg., Rm. 0405.
Friday, 12:00-12:50, Physics Bldg., Rm. 0405.

Graders: Haihong Che, hche@glue.umd.edu
Physics Bldg., Rm. 4223,

Andrej Petar Rasevic, andrejp@Glue.umd.edu
1202A IREAP (energy building)

Office Hours:

The course instructor is available for scheduled office hours between 11:30 p.m. and 12:30 every Tuesday and Thursday immediately before class under ordinary circumstances. Students are encouraged to contact Prof. Gates to arrange meeting at other times as desired.

For students with access to electronic mail, inquiries may be sent to the instructor at any time via e-mail.

Grading:

The final grade for the course will be determined by the following formula;

$$\text{F.G.} = \frac{20}{100}(\text{H.W.}) + \frac{40}{100}(\text{Midterm XAM})$$
$$+ \frac{40}{100}(\text{Final XAM}) \quad,$$

Examinations:

There will be one examinations given during the semester as well as a final at the end of the term. All examination are closed book. The mid-term examination is scheduled for **Mar. 21**. The final is presently scheduled for Wednesday, **May 21**, 1:30 - 3:30 pm. No makeup exams will be given except in the case of an extreme emergency. You are required to take the final exam.

Any emergency that might cause a student to miss an examination must be *rigorously* documented (doctor's note, legal notices, etc.) otherwise a grade of zero will be assigned to the student for the missed examination.

If any conflicts with the examination dates are known to the student these must be brought to the instructor's attention immediately. Otherwise, the student risks being assigned a grade of zero for the missed examination. Excuses after the fact are *not* acceptable and will result in an assigned grade of zero.

Homework:

Homework will be given regularly during the semester. It will be collected normally at the end of the lecture on each Tuesday, graded and returned to students. However, it is possible that not every problem will be graded. Instead a randomly selected subset of them will be graded. A record will be kept of each student's completed problems. This tally will be used to calculate the homework grade.

Problem solving is an essential part of physics. It is not possible to learn the subject <u>without</u> working through the details of problems. There is a strong correlation between doing homework and doing well on examinations. You are very unlikely to do well in this course **if** you do not take the homework seriously. **Late homework will <u>ONLY</u> be accepted with a physician's (or other official's) written note.** However, points will be <u>deducted</u> from the grade on late homework at a rate of <u>10 points/day</u>.

A Guide to Doing Homework:

If you wish to have the best possible grades on homework returned, you **must**

*1. Staple your papers together.

*2. Box your answers.

*3. Turn in **neat** homework (points will be deducted otherwise).

*4. Write your solutions in **pencil**.

*5. Always write out your solution in algebraic form **BEFORE** you substitute in numerical values.

*6. Always "carry along" correct dimensional units (i.e. mass, length, etc.) and give only appropriate numbers of significant figures.

*7. Consider whether your answers make "sense" by checking units etc.

*8. Draw a picture or sketch for every problem where it is appropriate.

*9. Describe in words, why and where equations being used appear in your write-up.

*10. **SHOW YOUR WORK**! Solutions or answers turned in without explanation will **NOT** receive full credit.

It should be noted that many of the above comments also apply to writing your solutions on examinations.

Disability Support Services:

The UMCP campus offers support in these cases. It is the responsibility of the effected students to contact the Counseling Center, Rm. 0126 Shoemaker Building 301-314-7682 or on-line at http://www.inform.umd.edu/dss/ in order to take advantage of this assistance. After this contact the course instructor.

Academic Dishonesty:

The University of Maryland has an established policy on academic dishonesty (see the webpage at

http://www.inform.umd.edu/CampusInfo/Departments/PRES/policies/iii100a.html).

Students are advised to become familiar with the policy which in part states,

> "The University can function properly only if its members adhere to
> clearly established goals and values. Essential to the fundamental
> purpose of the University is the commitment to the principles of
> truth and academic honesty. Accordingly, The Code of Academic
> Integrity is designed to ensure that the principle of academic hon-
> esty is upheld. While all members of the University share this respon-
> sibility. The Code of Academic Integrity is designed so that special
> responsibility for upholding the principle of academic honesty lies
> with the students."

Students who infringe upon this UMCP policy will be subject to **severe** sanction.

Tutorial Assistance:

Any student seeking additional assistance is urged to contact the course instructor. The Slawsky Physics Clinic is also an additional resource to explore. The Clinic does **NOT** have established specific hours for this course, so check with them ASAP about their availability.

Reading Assignments:

All reading assignments are required. It may occur that examination problems will be drawn from material not covered in lecture, recitation nor homework.

Tentative Physics 272 Schedule - Spring 2003

Date	Class#	Comment	Topic	Reading Assign.
Week 1				Chapters in Purcell
Jan. 28	1		Electrostatics : Charges & Fields	*Chapter* 1
Jan. 30	2		Electrostatics : Charges & Fields	*Chapter* 1
Jan. 31	3		Electrostatics : Charges & Fields	*Chapter* 1
Week 2				
Feb. 4	4	H.W. due	Electric Potential	*Chapter* 2
Feb. 6	5		Electric Potential	*Chapter* 2
Feb. 7	6		Electric Potential	*Chapter* 2
Week 3				
Feb. 11	7	H.W. due	Laplacian, Laplace's equ.	*Chapter* 2
Feb. 13	8		Vector func. div., curl	*Chapter* 2
Feb. 14	9		Vector func. div., curl	*Chapter* 2
Week 4				
Feb. 18	10	H.W. due	Electric Fields & Conductors	*Chapter* 3
Feb. 20	11		Electric Fields & Conductors	*Chapter* 3
Feb. 21	12		Electric Fields & Conductors	*Chapter* 3
Week 5				
Feb. 25	13	H.W. due	Electric Currents	*Chapter* 4
Feb. 27	14		Electric Currents	*Chapter* 4
Feb. 28	15		Electric Currents	*Chapter* 4
Week 6				
Mar. 4	16	H.W. due	Fields & Moving Charges	*Chapter* 5
Mar. 6	17		Fields & Moving Charges	*Chapter* 5
Mar. 7	18		Fields & Moving Charges	*Chapter* 5
Week 6				
Mar. 11	19	H.W. due	Magnetic Field	*Chapter* 6
Mar. 13	20	Begin Prep.	Magnetic Field	*Chapter* 6
Mar. 14	21	for Mid − term	Magnetic Field	*Chapter* 6
Week 8				
Mar. 18	22	No H.W. due	Special Relativity	*Appendix A*
Mar. 20	23		Special Relativity	*Appendix A*
Mar. 21	24		Mid − term Examination	

Week 9				Chapters in Purcell
Mar. 25			Spring Break	
Mar. 27			Spring Break	
Mar. 28			Spring Break	
Week 10				
Apr. 1	25	H.W. due	E & M Induction	*Chapter* 7
Apr. 3	26		E & M Induction	*Chapter* 7
Apr. 4	27		E & M Induction	*Chapter* 7
Week 11				
Apr. 8	28	H.W. due	AC Curcuits	*Chapter* 8
Apr. 10	29		AC Curcuits	*Chapter* 8
Apr. 11	30		AC Curcuits	*Chapter* 8
Week 12				
Apr. 15	31	H.W. due	AC Curcuits	*Chapter* 8
Apr. 17	32		Maxwell′s Eq.′ns and E & M Waves	*Chapter* 9
Apr. 18	33		Maxwell′s Eq.′ns and E & M Waves	*Chapter* 9
Week 13				
Apr.. 22	34	H.W. due	Maxwell′s Eq.′ns and E & M Waves	*Chapter* 9
Apr. 24	35		Maxwell′s Eq.′ns and E & M Waves	*Chapter* 9
Apr. 25	36		Maxwell′s Eq.′ns and E & M Waves	*Chapter* 9
Week 14				
Apr. 29	37	H.W. due	Elec. Fields & Matter	*Chapter* 10
May 1	38		Elec. Fields & Matter	*Chapter* 10
May 2	39		Elec. Fields & Matter	*Chapter* 10
Week 15				
May 6	42	H.W. due	Mag. Fields & Matter	*Chapter* 11
May 8	43		Mag. Fields & Matter	*Chapter* 11
May 9	44		Mag. Fields & Matter	*Chapter* 11
Week 16				
May 13	45	H.W. due	Summary	
May 15			NO CLASS	
May 26			NO CLASS	
May. 21			FINAL EXAMINATION	All material covered.

PHYS 272 Homework Assignment Schedule - Spring 2003

Assignment	Due Date	Problems
# 1	Feb. 4	1.3, 1.5, 1.16, 1.19, 1.26
# 2	Feb. 11	2.1, 2.4, 2.6, 2.8, 2.10
# 3	Feb. 18	2.12, 2.14, 2.15, 2.22, 2.31
# 4	Feb. 25	3.10, 3.15, 3.18, 3.23, 3.28
# 5	Mar. 4	4.2, 4.6, 4.11, 4.15, 4.21
# 6	Mar. 11	5.2, 5.4, 5.8, 5.13, 5.20
# 7	Apr. 1	6.4, 6.10, 6.12, 6.26, 6.33
# 8	Apr. 8	7.4, 7.12, 7.14, 7.23, 7.25
# 9	Apr. 15	8.2, 8.3, 8.7, 8.8, 8.13
# 10	Apr. 22	8.15, 9.1, 9.2, 9.5, 9.6
# 11	Apr. 29	9.7, 9.8, 9.9, 9.11, 9.13
# 12	May 6	10.3, 10.8, 10.10, 10.17, 10.24
# 13	May 13	11.4, 11.7, 11.11, 11.17, 11.23