

PHY 2140 - GENERAL PHYSICS – Syllabus

Semester: Fall 2003

Lecturer:

Prof. **Alexey A. Petrov**, Room 260 Physics Building,
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Lecture Time/Room:

Lecture **Monday, Wednesday, Friday, 10.40-11.35 am**, Room 150 General Lectures

Quiz Sections	Time	Room	Quiz Instructor
10780	Friday 11:45 AM - 12:40 PM	028 Manoogian	Dr. F. Gabbiani
10997	Wednesday 11:45 AM - 12:40 PM	028 Manoogian	Dr. P.E. Karchin
13493	Tuesday 10:40 AM - 11:35 AM	177 Physics	Dr. J.T. Chen
13569	Thursday 10:40 AM - 11:35 AM	177 Physics	Dr. F. Gabbiani

Office Hours:

Tuesday 1:00-3:00 PM, on main campus, Physics Research Building, Room 260,
or by appointment.

Required Text:

R.A. Serway and J.S.Faughn, **College Physics**, 5th Edition (Saunders Publishing)

Grading:

Your course grade will be determined by your performance in three Hour Exams, Reading Quizzes, Quiz Section results, and a Final Exam. The Final will cover the material presented during the entire semester. The overall course grade will be determined on the basis of the following distribution:

Reading Quizzes (bonus)	5%
Quiz section performance/Homework	10%
Best Hour Exam	25%
Second Best Hour Exam	25%
Final	40%
Total	105%

Reading Quizzes (bonus 5%):

It is important for you to come to class prepared, i.e. be familiar with the material to be presented. To test your preparedness, a simple five-minute quiz, testing your qualitative familiarity with the material *to be discussed* in class, will be given at the beginning of some of the classes. No make-up reading quizzes will be given.

BONUS POINTS: There are 13 chapters with reading to be covered in this course. Turning in a *typed* one or two page summary of the reading assignment (i.e. chapter *to be discussed*) will be worth 0.5 point, and a good one will be worth 1.5 points. Additionally, 0.5 points will be awarded for the consistency at the end of the semester. Reading summaries are due at the *start* of a lecture starting out a new chapter. Late reading summaries will not be accepted. *Summaries longer than 2 pages are strongly discouraged and will be automatically given lowest possible amount of points.* These points are not simply additions to the total, but reduce the weight of the other requirements. For example if 20 points were earned in Reading Summaries then the contributions would be Reading Summaries 20%, Quiz Section performance 8%, Best and Second Best Hour Exams 20% each, Final 32%.

Homework and QUIZ Sessions (10%):

The quiz sessions meet once a week. They are an essential part of the course. They allow meeting together in small groups to ask questions, discuss lecture material, discuss assigned problems, etc. The assigned homework problems are intended to test your understanding of course material. In the same way you must practice to become proficient at a sport or musical instrument, you must work problems in order to master basic physics. It is very important that you work out the solutions to each problem, and understand clearly the correct method of solution. Homework problems will be similar to those you might expect during examinations. In order to assess your performance, five (5) quizzes will be given to you by your quiz instructor. In order to encourage you to do your homework, your quiz instructor will randomly determine if a quiz problem is to be assigned for an in-class test, or one of the homework problems, due on that date, is to be collected. Make-up in-class quizzes can be given at the discretion of your quiz instructor.

BONUS POINTS: will be additionally assigned by your quiz instructor.

Hour Exams (25% each) and Final Exam (40%):

There will be THREE (3) Hour Exams and one Final Exam. There is no penalty for missing just one of the three Hour Exams, as only scores from your best two exams will be used in determining your final score (25% each). If you miss an additional exam, a zero will be used for that missed second exam in determining your total score. For a true emergency, a student may be allowed to take a make-up Final Exam. However, you must obtain permission to do so from the lecturer prior to or (at the latest) on the day of the Final. The Final Exam is worth 40% of your final score.

Additional **BONUS POINTS** will be given out for class activity.

Online Content (additional resources): The Lecture Online system provides online text, illustrations and movies that you can use to supplement your reading. Interactive True-False questions will help test your understanding. If you would like to use this system, please e-mail me to obtain your password and instructions on how to use the system.

The overall course grade will be determined on the basis of the following grading curve:

Grade	Cumulated Score	Grade	Cumulated Score
A	91-100	C	60-64
A-	85-90	C-	55-59
B+	80-84	D+	50-54
B	75-79	D	45-49
B-	70-74	D-	40-44
C+	65-69	E	0-39

Academic Dishonesty:

If you are willing to put forth the effort, you should have no problem earning a respectable grade. Cheating and other forms of dishonesty will not be tolerated. Anyone found cheating on any activity will receive a zero for that part of their grade and suffer the possibility of receiving a failing grade for the course.

Laboratory:

The laboratory is a separate part of the course, with its own grades and procedures. These will be covered by your lab instructor. The experiments provide tangible demonstration and reinforcement of the ideas presented during the lectures. In addition, the laboratory is meant to show the importance of experiments in science. Your laboratory Manual is to be purchased separately at the University Bookstore. For further details please inquire with Dr. Scott Payson at 313-577-3280.

Students with disabilities:

If you have a physical or mental impairment that may interfere with your ability to successfully complete the requirements of this course, please contact the Education Accessibility Services (EAS) in Room 583 of the Student Center Building to discuss appropriate accommodations on a confidential basis. EAS can also be reached by phone at 313-577-1851.

Course Outline and Schedule (a rough guide only)

Week	Date	Topic	Chapter	H/W Problems
1	9/3	Electric Charges, Coulomb's law	15.1-15.3	<u>Ch 15</u> M: 1,4
	9/5	Electric Field	15.4-15.6	P: 3,7,10,11,17,
2	9/8	Van De Graaf, Oscilloscope, Gauss' Law	15.8-15.10	23,27,28,40
	9/10	Potential Energy & Electric Potential	16.1-16.4	<u>Ch 16</u> M: 4,5
3	9/12	Capacitance and Capacitors	16.6-16.8	P: 1,3,9,11,17,19,
	9/15	Energy Stored in a Capacitor	16.9-16.10	21,25,29,30,39
	9/17	Electric Current and Ohm's Law	17.1-17.3	<u>Ch 17</u> P: 1,3,5,11,

	9/19	Resistivity, Electrical Power	17.4-17.7	17,19,21,25,29,39
4	9/22	EMF, Resistors	18.1-18.3	<u>Ch 18</u> M: 3,4; C: 19
	9/24	Kirchoff's Rules, RC Circuits	18.4-18.5	P: 1,7,9,17,23,28
	9/26	FIRST EXAM (CHAPTERS 15-17)		
5	9/29	Magnetic Fields and Force	19.1-19.4	<u>Ch 19</u> P: 2,3,5,7,11,
	10/1	Applications of Magnetic Forces	19.5-19.7	19,25,31,33,37,45
	10/3	Ampere's Law and Applications	19.8-19.9	
6	10/6	Ampere's Law (continued)	19.10-19.11	
	10/8	Induced EMF, Faraday's Law	20.1-20.2	<u>Ch 20</u> P: 1,7,9,11,
	10/10	Motional EMF, Lenz's Law	20.3-20.4	17,21,22,24,25,28,
7	10/13	Generators, Motors	20.5	33,37
	10/15	Inductance, Energy in Magnetic Field	20.7, 20.9	
	10/17	AC Circuits	21.1-21.3	<u>Ch 21</u> P: 3,5,9,13,
8	10/20	The RLC Series Circuit	21.4-21.6	19,27,31
	10/22	Electromagnetic Waves and Spectrum	21.11-21.12	
	10/24	SECOND EXAM (CHAPTERS 18-20)		
9	10/27	Relativity, Speed of Light	26.1-26.3	<u>Ch 26</u> P: 3,5,9,13,
	10/29	The Michelson-Morley Exp.	26.4	15,21,27,29
	10/31	Time Dilation, Length Contraction	26.5-26.6	
10	11/3	Relativistic Momentum	26.7	
	11/5	Addition Of Velocities, Relativistic Energy	26.8-26.10	
	11/7	Blackbody Radiation, Planck's Hypothesis	27.1	<u>Ch 27</u> P: 3,5,7,13,
11	11/10	The Photoelectric Effect	27.2-27.3	19,27,33,37,47,55
	11/12	X-Rays, Compton Scatter., Pair Product.	27.4-27.7	
	11/14	THIRD EXAM (CHAPTERS 21 & 26)		
12	11/17	Photons, Wave Properties of Particles	27.8-27.9	
	11/19	Wave Function, The Uncertainty Principle	27.10-27.11	
	11/21	Atomic Spectra and Structure	28.1-28.2	<u>Ch 28</u> P: 1,7,13,27,
13	11/24	The Bohr Theory of Hydrogen		33,37,39
	11/26	De Broglie Waves, Quantum Mechanics	28.5-28.7	
	11/28	<i>Thanksgiving Recess</i>		
14	12/1	The Periodic Table, Atomic Transitions	28.8-28.11	
	12/3	Nuclear Structure, Binding Energy	29.1-29.3	<u>Ch 29</u> P: 1,5,9,13,
	12/5	Decay Processes, Radioactivity	29.4-29.6	17,25,29,36
15	12/8	Elementary Particles	30.4-30.9	<u>Ch 30</u> P: 19,20,21,
	12/10	Elementary Particles	30.10-30.16	25,33
16	12/18	FINAL EXAM (INCLUSIVE, 8:00 AM-10:30 AM)		

