Physics 188: Advanced Classical Physics ... Spring 2015

Instructor: Dr. Klaus Bartschat
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Office Hours: MWF 10 a.m. – 11 a.m., Friday 3:30 p.m. – 5:00 p.m.

Time: TBA (independent study)

Texts: Mechanics:
"Classical Dynamics", S.T. Thornton and J.B. Marion, 5th edition), Harcourt, Brace, Jovanovich (2004)
Electrodynamics:
"Introduction to Electrodynamics", D.J. Griffiths (3rd edition), Prentice Hall (1998)

1) Contents: (subject to revision)

a) Mechanics:
Chapter 9: Collisions
Chapter 10: Motion in a Noninertial Reference Frame
Chapter 11: Dynamics of Rigid Bodies
Chapter 4: Nonlinear Oscillations and Chaos (if time allows)
Chapter 12: Coupled Oscillations
Chapter 13: Continuous Systems: Waves (if time allows)
Chapter 14: Special Relativity Theory (review)

b) Electrodynamics:
Chapter 7: Electrodynamics: Maxwell's Equations
Chapter 8: Conservation Laws: Charge, Energy, Momentum
Chapter 9: Electromagnetic Waves
Chapter 10: Potentials and Fields
Chapter 11: Electromagnetic Radiation

2) Desired Outcomes: The principal objective of this course is to extend your previous courses on Theoretical Mechanics and Electrodynamics, so that you have effectively taken six credit hours (four each before and now 50% each in this four-credit hour course) in these two areas. Based on the 2011-2012 course catalogue for Drake University, this course is only required for a Bachelor of Science degree in Physics, i.e., not for a Bachelor of Arts (BA) in Physics nor for a Bachelor of Science (BS) in Astronomy. It is, however. highly recommended for the latter degree program (BS in Astronomy). Consequently, the course is designed to provide you with a solid base for graduate school. The level of mathematics is likely going to be challenging. As usual in classes for physics majors, the development of problem solving skills (using both paper and a computer) will be emphasized.

3) Class Tests:
There will be two tests during the term and one final exam. The dates for the tests are:

Test 1: Friday, March 13, 2015
Test 2: Friday, May 1, 2015
Final Exam: Tuesday, May 12, 2013, 9:30 a.m. – 11:20 a.m.

Exams will be graded on a relative scale, i.e., the percentages required for a particular grade will depend on the level of difficulty.

NOTE: There will be no make-up exams! If you miss a class a test, a grade of F will be assigned, except if you can provide a medical certificate showing your inability to take the test at the scheduled time. In that case, the test will be replaced by an **oral examination**.

4) Homework: Since it has become very easy to obtain the solutions manual from the internet, I will generally recommend problems for the individual chapters that you should try to solve on your own and let me know if you have trouble. No credit will be given (or deducted) for doing these problems from the book – other than that you may wish you had done them when it comes to the tests. I may hand out problems that are not in the book as well as computer projects. These problems and projects will have deadlines, and if a due date is missed, every day late will result in subtracting 20% of the maximum possible number of points. For example, if your work is worth 42 points out of a maximum of 50 points but handed in two days late, you will only be credited 22 points (namely 42 – 40% of 50 = 42 - 20 = 22).

5) Overall grading: The total grade for the course will consist of:

item	relative weight
two term tests	25% each
final exam	35%
homework, computer projects	15%

For each individual item, you will receive grades including (+) and (-), and the final grade will be calculated as the weighted average of the individual performances. It will then be rounded off to the nearest full grade.

NOTE:
a) Homework and computer grades cannot lead to a better final grade than your best test grade! For example, if your homework and computer projects are all A's, but all your tests are D's, you will get a D rather than a C in this course.
b) Purely mathematical schemes like the one outlined above will generally yield a good estimate of the final grade. Nevertheless, there may be exceptions, such as having a very good or very bad day on an exam. **The final result may deviate from the above estimate by a grade (up or down) if special circumstances seem to warrant it.**

6) Academic Dishonesty:
Any incidence of academic dishonesty will result in a failing grade. Furthermore, any such incident will be reported to the dean of the student's college, for possible further penalties.