Classical Physics I

Physics 200

Gustavus Adolphus College - Fall 2004

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Textbooks: *Physics For Scientists and Engineers*, Serway *and* Jewett, 6th Edition,

Recommended: *Quick Calculus*, by Kleppner and Ramsey (Wiley 1985). For students who have not previously completed a college-level course sequence in calculus.

Student's Solution Manual for Physics for Scientists and Engineers, by Serway.

Course Policy and Evaluation

1. **Objectives:** As the first class in the sequence for science and engineering students at Gustavus, this course shares several objectives with the rest of the physics program. It is hoped that when students have completed Classical Physics I they will have learned some basic problem solving skills, some computer and calculation skills, some quantitative and empirical reasoning skills, and, of course, some physics, specifically mechanics.

2. **Expectations:** Students in Classical Physics I are expected to have a solid background in trigonometry (or pre-calculus) and algebra. They are also expected to be concurrently enrolled in Calculus I if they have not already successfully completed a college level course in it. The instructor will discuss the calculus involved in this course as necessary, but it is important that the students also see it in another course setting. In addition, all students are required to be concurrently enrolled in **PHY201, Classical Physics I Laboratory**.

3. **Academic Honesty:** The instructor is bound to abide by the College's Honesty Policy and therefore must report all incidents of academic dishonesty (cheating, copying, etc.) to the Dean's Office. In the spring of 2003, the College adopted an academic honesty policy and honor code system, which is printed in the Academic Bulletin and in the Gustavus Guide. All students will be required to abide by the policy and write the following honor code on every examination and graded assignment:
   "On my honor, I pledge that I have not given, received, nor tolerated others' use of unauthorized aid in completing this work."
   Not all components of this course are subject to the Honor Code.. The instructor will clearly identify to which items the Code applies. But the student is responsible for requesting clarification if necessary.

4. **Learning Styles:** Recognizing that students learn science in a variety of ways, the instructor will take advantage of many different techniques, including collaborative learning, to maximize the overall effectiveness of this course. Although collaborative efforts will be encouraged for solving in-class problems, assigned homework, labs, and some quizzes, they are **not allowed** for most quizzes and all exams. The instructor will make it clear which quizzes are to be group efforts and which are not to be.

5. **Teacher Licensure:** This course fulfills some of the standards required for Minnesota teaching licensure. For details see http://physics.gac.edu/Education/phy200_standards.htm

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6. **Class Meetings and Reading Assignments**: The class will meet five days a week (M-F) for lecture, discussion, homework review, quizzes, and exams. Quizzes and exams are indicated on the following schedule. The student will be responsible for reading the text before coming to class and completing the multiple choice questions.

7. **Homework**: Problems will be assigned on a weekly basis. Problems will be graded and returned to the student. Homework should be neat and orderly. Late homework will be accepted at the discretion of the instructor with some loss of points. In addition, there will be a brief writing assignment each week which will be turned in electronically.

8. **Group Activities:** A number of group activities, including problem solving and simulations, will be done throughout the semester. These activities will not be scheduled and may be used to test students' knowledge of old material or to introduce new material.

9. **Attendance**: Regular attendance at all lectures is expected and excessive absenteeism will result in some reduction of final grade.

10. **Quizzes**: There will be ten to fifteen minute quiz almost every week that there is no exam.

11. **Exams**: There will be four one-hour exams and a two-hour final exam as scheduled below.

12. **Missed Exams**: Students are expected to arrange in advance to take an exam at other than the announced time. Permission to make up a missed exam after the fact will be at the discretion of the instructor

13. **Incompletes**: A grade of incomplete will be given <u>only</u> for work not completed due to circumstances beyond the control of the student.

14. **Physics Tutors:** Limited tutoring for this course will be available at times announced in the departmental tutoring schedule.

15. **Office Hours, etc.:** My scheduled office hours are 2nd and 4th hours every day. I will make every effort to be available during these times for individual assistance and advising. I will also be available at other times by appointment. Don't be afraid to ask for help.

16. **Email:** You may contact me by electronic mail; **chuck@gac.edu**. I will respond as soon as I can to any questions that you might have.

17. **Evaluation**:

Hour Exams	40%	A	94 - 100	C+	74 - 78
Final Exam	15%	A-	90 - 94	C	70 - 74
Homework	20%	B+	86 - 90	C-	66 - 70
Quizzes	15%	B	82 - 86	D+	62 - 66
Group Problems		B-	78 - 82	D	58 - 62
& Participation	10%	F	< 58		

Assignment of final letter grades will also take into account the instructor's subjective evaluation of the student's attendance, initiative, class participation, preparation (particularly quantity and quality of homework), and evidence of improvement.

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Course Schedule

Week Beginning	Chapter	Subject	Reading Assignment
September 6	Chapters 1 & 5	Introduction & Force	Sections 1.1-1.7 & 5.1-5.4
September 13	Chapters 5, 2, 13	Force, Motion in 1-D, Gravity	Sections 2.1-2.7 & 13.1-13.2
September 17	****** Quiz 1 on Force and Motion in 1-D *****		
September 20	Chapters 10, 7, 8	Rotation & Energy	Sections 10.1-10.3, 7.1-7.3 and 8.1-8.3
September 24	****** Quiz 2 on Rotation and Energy *****		
September 27	Chapters 9 & 11	Linear and Angular Momentum	Sections 9.1-9.3 & 11.1-11.4
October 1	***** Exam 1 on Force, Motion in 1-D, Gravity, .. Angular Momentum *****		
October 4	Chapter 3	Vectors & Sailing	Sections 3.1 - 3.4
October 5 & 6	******* Nobel Conference - No Class ******		
October 11	Chapter 4	Motion in 2-D & Relativity	Sections 4.1 - 4.6
October 14	****** Quiz 3 on Chapters 3 & 4 *****		
October 18	Chapter 5	Newton's Laws of Motion and Atomic Force Microscopy	Sections 5.5 - 5.8
October 22	***** Exam 2 on Chapters 3 - 5 *****		
October 23 – 26	******* Fall Break ********		
October 25	Chapter 6	Applications of Newton's Laws And Chaos Theory	Sections 6.1 – 6.6
October 29	****** Quiz 4 on Chapter 6 *****		
November 1	Chapters 7 & 8	Work, Energy, & Energy Levels	Sections 7.4–7.9
November 8	Chapters 8 & 9	Linear Momentum & Collisions	Sections 8.4-8.6 & 9.4-9.7
November 9	***** Exam 3 on Chapters 6 - 8 *****		
November 15	Chapters 9 & 12	Collisions, Scattering, & Statics	Sections 12.1-12.3
November 15	****** Quiz 5 on Chapter 9 *****		

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Course Schedule (Continued)

Week Beginning	Chapter	Subject	Reading Assignment
November 22	Chapters10 & 11	Rotation and Angular Momentum	Sections 10.4 – 10.9
November 24	****** Quiz 6 on Chapters 10 & 11 *****		
Nov. 25 - 28	******* Thanksgiving Break ********		
November 29	Chapter 11	Angular Momentum & Atomic Spin	Sections 11.5 – 11.6
December 3	***** Exam 4 on Chapters 9 - 12 *****		
December 6	Chapter 13	Gravitation and General Relativity	Sections 13.3 – 13.7
December 10	***** Quiz 8 on Chapter 13 *****		
December 13	Chapters 1-13	Review	
December 20 8:00 AM	***** Final Exam - Comprehensive *****		

Student Evaluation of Teaching
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1) How much do you believe you have learned in this course?
a) virtually nothing b) very little c) some d) a fair amount e) a great deal

2) I have been able to get help from the instructor when I requested it.
a) never b) seldom c) sometimes d) usually e) always

3) Course requirements and the grading system were made clear from the start.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

4) I received adequate feedback from the instructor during the course to assess my progress.
a) never b) seldom c) sometimes d) usually e) always

5) How well did the evaluation techniques (exams, quizzes, assignments, etc) seem to measure your mastery of the course material?
a) very poorly b) inadequately c) uncertain d) adequately e) very well

6) How well do think the instructor accomplished (is accomplishing) the objectives of the course?
a) very poorly b) inadequately c) uncertain d) adequately e) very well

7) The instructor helped to increase your interest in the subject.
a) not at all b) very little c) somewhat d) a fair amount e) a great deal

8) The instructors interest in teaching this course seems
a) very low b) low c) moderate d) high e) very high

9) For my preparation and ability, the level of difficulty of this course was
a) very elementary b) somewhat elementary c) about right d) somewhat difficult e) very difficult

10) Rate the overall effectiveness of this instructor:
a) poor b) fair c) satisfactory d) good e) excellent

11. How many hours per week on the average did you spend studying or preparing for this course?
a) <2 hours b) 2-4 hours c) 5-7 hours d) 8-10 hours e) >10 hours

12. In this course I made substantial progress toward learning fundamental principles, generalizations, theories, or methods.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

13. In this course I made substantial progress toward learning to apply course material to improve rational thinking, problem-solving, and decision making.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

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14. The learning which resulted from the assignments was worth the time spent completing them.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

15. The text book was a valuable part of the course.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

16. The instructor was helpful to me in learning to apply course material in order to improve rational thinking, problem solving and decision making.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

17. The instructor was flexible in adjusting the pace and presentation of the material to students needs.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

18. The instructor made efficient use of class time.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

19. The instructor stressed important material.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

20. The instructor communicates at a level appropriate to my understanding.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

21. The instructor uses enough examples and illustrations to clarify the material.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

22. The instructor is able to explain difficult concepts in a clear and straightforward manner.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

23. The instructor presented the material at a rate which was
a) much too slow b) too slow c) about right d) too fast e) much too fast

24. The instructor is friendly toward students, has a genuine interest in their education, and relates to students as individuals.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

25. The instructor is actively helpful when students have difficulty.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

26. The instructor's manner of presentation is interesting and stimulating.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

27. The instructor maintains an atmosphere which actively encourages learning.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

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28. The student assistants and tutors in this course seemed knowledgeable.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

29. The student assistants and tutors made constructive comments on work, either orally or in writing.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

30. The exams were too long for the time allotted to them.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

31. The frequency of exams was
a) far too small b) too small c) about right d) too large e) far too large

32. The criteria by which the instructor grades students in this course are reasonable.
a) strongly disagree b) disagree c) uncertain d) agree e)strongly agree

1) What are the strengths of this individual as an instructor at Gustavus?

2) What are the weaknesses of this individual as an instructor at Gustavus?

3) Would you recommend this course by this instructor to fellow students? (Why or why not?)

4) How well do you think that the order of coverage of material worked for you? Any suggestions are greatly appreciated.

5) How much did you learn in this course is a result of both your effort and the instructor's. Please address, to the extent possible, both what you have learned in this course thus far and the instructor's contributions to your learning.