

Physics 3740 Introduction to Relativity and Quantum Theory Summer 2008

University of Utah (3 credits, 2 June–31 July, MWF 11.00 a.m.–12.45 p.m., 102 JFB)

Instructor: Dr Christopher Stone, Associate Professor (Lecturer)

Office: 216 South Physics (581–5395, with an answering machine)

Office hours: MWF 10.00–10.50 a.m., or by appointment. You may leave a message in my pigeon-hole at the Physics Department office: 201 JFB (phone 581–6901). E-mail: cstone@physics.utah.edu
Mobile phone: (801) 528–2012 (please use only for ‘emergencies’, after having tried e-mail).

Secretary: Mary Ann Woolf, 205 JFB, 581–4246

Course web page: www.physics.utah.edu/~woolf/3740_stone.html

Textbook: *Modern Physics* (5th ed.) by Paul Tipler and Ralph Llewellyn (W. H. Freeman, 2008)

Recommended Prerequisites: Physics 2210 and 2220, Mathematics 2250

Course Description:

We shall cover Part 1 of the textbook (essentially the first 7 chapters), some sections in more detail than others. If time permits we can also do a few topics from Part 2 (‘Applications’). The lectures will follow the book fairly closely, but supplementary information may also be discussed in class, and you will be held responsible for it as well as for textbook material on the examinations. Therefore, regular class attendance and participation are strongly encouraged.

There will be a set of homework problems due each week (usually on Wednesday; see pp 2 and 3). The lowest *two* of your homework scores will be dropped when computing your total for the course. If you wish, you may work together on homework, provided that each of you writes up his or her own solutions and does not merely copy from someone else. You may find that you learn more by discussing concepts and collaborating with other students of approximately the same level as yourself than you would by simply working alone. Homework solutions will be posted on the notice-board outside 101 JFB, and will also be available on the course web page, along with past examination problems for review.

To get the most you can from this course, it will behove you to study your textbook and notes carefully till the material makes sense to you. If it does not seem to make sense, talk to the TA who marks your papers, Seoyoung Paik (seoyoung.paik@gmail.com, 322 JFB, 581-7078), or to me. We shall be glad to help you. Please seek assistance as soon as you have a significant problem, so as not to fall behind in a subject that is unavoidably cumulative in nature. I urge you to read the relevant sections of your textbook at least once *before* we get to them in the lectures (and again afterwards), as we shall not have enough time to discuss in class all of the textbook material that is relevant to the course. Also, feel free to ask questions or raise points of concern during the lectures. That way we can use our class time as efficiently as possible by concentrating on those parts of the subject that you find most difficult.

There will be three in-class examinations during the term (see page 2 for probable dates and coverage), testing you on both the information in the textbook and that discussed in class. You may use one standard sheet of paper (front and back) with formulas and notes during the exam. The lowest one of your three exam scores will be dropped when computing your total marks for the course. The Final Examination (for which you may use four note sheets), on **Thursday 31 July**, will be comprehensive, but weighted somewhat towards Chapter 7, since that chapter will not have been covered on the previous exams. The total marks for the term will consist of 24 per cent (the sum of your best six homework scores), plus 48 per cent (the sum of your best two ordinary exams), plus 28 per cent (Final Exam), for a total of 100 per cent. Depending upon the difficulty of the exams, as well as other factors, the grading scale for the course is expected to be approximately as follows (in per cent):

| | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|
| E | 50 | D- | 54 | D | 60 | D+ | 64 | C- | 68 | C | 74 |
| 74 | C+ | 78 | B- | 81 | B | 87 | B+ | 90 | A- | 93 | A |

Summer 2008**Tentative Timetable for Physics 3740****Stone**

(subject to change, with notice given in class)

Monday 2 June: Chapter 1

Wednesday 4 June: Chapter 1

Friday 6 June: Chapter 1

Monday 9 June: Chapters 1 and 2

Wednesday 11 June: Chapter 2; **HW 1 due**

Friday 13 June: Chapter 2

Monday 16 June: Chapter 3

Wednesday 18 June: Chapter 3; **HW 2 due**Friday 20 June: **First Exam** (Chapters 1 and 2)

Monday 23 June: Chapter 3

Wednesday 25 June: Chapter 4; **HW 3 due**

Friday 27 June: Chapter 4

Monday 30 June: Chapter 5; **HW 4 due**Wednesday 2 July: **Second Exam** (Chapters 3 and 4)

Friday 4 July: Holiday (no classes held today)

Monday 7 July: Chapter 5

Wednesday 9 July: Chapters 5 and 6; **HW 5 due**

Friday 11 July: Chapter 6

Monday 14 July: Chapters 6 and 7

Wednesday 16 July: Chapter 7; **HW 6 due**Friday 18 July: **Third Exam** (Chapters 5 and 6)

Monday 21 July: Chapter 7

Wednesday 23 July: Chapter 7; **HW 7 due**

Friday 25 July: No class held today

Monday 28 July: Chapter 7; **HW 8 due**

Wednesday 30 July: Revision for Final Exam

Thursday 31 July: Final Exam (comprehensive) 10.00 a.m. to noon, in **103 JFB**

Beginning Wednesday 6 August, you may pick up your Final Exam paper from my secretary, Mary Ann Woolf (205 JFB, tel. 581-4246), or from the receptionist at 201 JFB (581-6901). Be prepared to show some form of picture identification.

Summer Term 2008

Physics 3740

Stone

Homework Problems from *Modern Physics* (5th ed.) by Tipler and Llewellyn:

| <u>HW Set</u> | <u>Problems</u> | <u>Date Due</u> |
|---------------|---|-------------------|
| 1 | Ch. 1: 15, 23, 30, 34, 42, 45, 51, 53, 56, 57 (assume that the personified observers of this problem are located at the <i>origins</i> of their frames), 59 | Wednesday 11 June |
| 2 | Ch. 2: 3, 11, 14, 18, 21, 26, 27, 29, 45, 46, 48 | Wednesday 18 June |
| 3 | Ch. 3: 15, 18, 22, 25, 32, 37, 38, 42, 46, 50 53, 54, 55, 56 (use the result of 49) | Wednesday 25 June |
| 4 | Ch. 4: 3, 13, 19, 20, 24, 27, 32, 36, 37, 43, 45, 48, 52 | Monday 30 June |
| 5 | Ch. 5: 6, 8, 15, 17, 20, 25, 29, 30, 35, 37, 45, 49, 51 | Wednesday 9 July |
| 6 | Ch. 6: 3, 6, 10, 16, 19, 23, 26, 33, 36, 39, 44, 48 | Wednesday 16 July |
| 7 | Ch. 6: 55, 57 Ch. 7: 5, 9, 14, 15, 17, 19, 21, 22, 24, 25, 28 | Wednesday 23 July |
| 8 | Ch. 7: 30, 33, 36, 39, 40, 41, 42, 48, 58, 61, 63, 66, 67 71 (use the result of problem 60, not 57), 73 | Monday 28 July |