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December 16, 2015
Hans P. Paar

4C SYLLABUS

NEWS ITEMS, LAST ON TOP

12/16/2015: The Final and its solutions have been posted after some delay caused by the need for a make-up Final that took place yesterday.

12/12/2015: The scores for the Final and for the course as a whole have been posted with their histograms as well as the letter grades. The letter grades are as follows: $560 <$ grade: A+, $520 <$ grade ≤ 560: A, $480 <$ grade ≤ 520 A-, $420 <$ grade ≤ 480: B+, $360 <$ grade ≤ 420: B, $320 <$ grade ≤ 360: B-, $280 <$ grade ≤ 320: C+, $260 <$ grade ≤ 280: C, $200 <$ grade ≤ 260: C-, grade ≤ 200: F. If you are not completely happy with your letter grade: 4C is considered by many the most difficult of all five Physics 4 quarters. (The runner-up is 4E, Modern Physics.)

The Finals and some quizzes are ready for pickup outside my CASS office.

12/8/2015: The solutions to Quiz #4 have been posted.

12/7/2015: The grades of Quiz #4 and their histogram have been posted together with the solutions to the homework of Chapter 30.

The solutions to the 2014 Final and its four Quizzes have been posted on the 2014 website of 4C.

12/4/2015: No office hours today. See you Monday at 3:30 pm in or near my CASS office.

12/2/2015: There will be a review session next Monday 12/7 from 3:30 pm - 5:00 pm in the lecture room across from my CASS office in the SERF building.

12/1/2015: Quiz #4 will be mostly on Electrostatics but some problems about Magnetism and Faraday's Law are possible. The solutions to the homework of Chapter 29 have been posted.

Note that the four 4C Quizzes of Fall 2014 are available for your perusal on its website.

11/30/2015: In view of the upcoming Quiz #4 this Wednesday there will be extra office hours today, Monday 11/30, from 4:00 - 6:00 pm in my CASS office in the SERF building.

11/25/2015: There will be a lecture today at the usual time and place. We will continue with applications of Faraday's Law.

11/20/2015: The Registrar has finalized the Final's location and time. The Final is on Wednesday December 9 (as before) from 11:30 am - 2:30 pm in WLH 2205. Please plan your travel for the Christmas break accordingly.

There will be no office hour today as we had a very fruitful Discussion Session last evening.

11/17/2015: The solutions to the homework of Chapter 25 through 28 have been posted. There is more here than you need for Quiz #3.

11/16/2015: Quiz #3 will cover the material on magnetism we did in class (and is not in the book) and all Chapters of the book through and including Chapter 26. Of chapter 27 we only include sections 27-1, 27-2, 28-1, 28-4, and 28-6.

11/9/2015: Last Thursday we started magnetism. For that we are not following Giancoli but follow a different path, worthy of Physics 4, and start with the two Maxwell's equations related to magnetism. Thus this material is not in the book and proper note taking is essential. As stated in the Course Outline below we will start using Gauss' and Stokes' Theorems in Week 6 and we did because we need them for the introduction of magnetism.

I noticed that some students were absent from last Thursday's lecture. Those absent are strongly advised to adjust their schedules so that they can attend the coming lectures, at least until we make contact with the book again. The current material on magnetism will be on Quizzes and the Final even though it is not in the book.

11/6/2015: Today's office hours are canceled because we had a very fruitful and well attended Discussion Session last evening.

11/04/2015: The Registrar has found a room for 4C where we can have a second Discussion or Homework Session in addition to the one we already have on Tuesdays. We will meet at York 4080A starting tomorrow Thursday 11/5 and meet each week, except Thanksgiving 11/26, from 6:00 - 6:50 pm. Yury and I will share the stage.

I have scheduled the makeup Quiz. It will be on Wednesday 12/2 and will have problems about all of electrostatics and not on magnetism. You are anyway reviewing that material for the Final the week after. The other three Quizzes are unchanged in date, time, and content. As mentioned in class I will count the best three out of four Quizzes. For most of you that means that Quiz #2 will be dropped and replaced by Quiz #4 depending upon your four Quiz scores.

11/02/2015: The grades to Quiz #2 and their histogram have been posted as have Quiz #2 and its solutions. The mean is quite low (31). We will discuss this matter today Tuesday 11/3 in the lecture and discuss a remedy.

10/26/2015: Last years's Quiz #2 has been posted so you can get an idea of what to expect. Contrary to what the Syllabus implies, the next Quiz #2 will not include Chapters 25 and 26 but will be be on Chapters 21 - 24 inclusive. The solutions to the homework of Chapters 23 and 24 have also been posted.

10/21/2015: Problem 4 of Quiz #1 has been regraded. The new grades, their histogram, and the solutions have been posted. Please verify that your grade is correctly listed. The quizzes will be returned at today's lecture.

10/19/2015: The grades for Quiz #1 have been posted. A histogram of the grades will follow soon.

10/15/2015: My Friday 12/16 office hours are canceled owing to an all afternoon research meeting. Instead I will have an office hour Monday 10/19 at 3:30 pm.

10/12/2015: The solutions to the homework of Chapters 21 and 22 have been posted. Last year's Quiz #1 on those two chapters has also been posted so that you can get an idea of the number of problems and what kind of problems to expect. Please do not assume that next Wednesday's quiz will have the exact same type of problems.

10/8/2015:
Starting next week Tuesday 10/13/2015 the Tuesday - Thursday lectures and the Wednesday discussion sessions will be in WLH 2205 and not in CH 222 for the rest of the Fall quarter. CH 222 will be renovated during that time and is therefore not available.

10/4/2015:
There will be a once only office hour Monday 10/5 at 4:00 pm in my CASS office. All are welcome.

We will need the nabla (also called del) operator soon. This operator is covered in the (concurrent) prerequisite vector calculus (Math 20E). A review can be found in nablaoperator.pdf on the 4C website. We will only need sections 1 through 3 and section 6 until the end of page 4. I will use the next discussion/problem session on 10/6 to discuss this material.

10/2/2015:
We have encountered several topics in recent lectures that you have learnied about in prerequisite courses. As I mentioned in class, if you are uncertain about any of those, this is the time to review that material. The topics are: Jacobians to transfer from rectangular coordinates to cylindrical or spherical coordinates, potential energy, torque and work done by a torque.

9/29/2015:

The information on office hours and contact information is added and updated in the Syllabus. Please note that the location of the Wednesdays lectures is WLH 2113, not MANDE B150 as originally listed by the Registrar.

8/31/2015:
The first lecture on 9/24 will be given by Dr. Eric Michelson, replacing the regular instructor.

COURSE ORGANZATION

Course instructor:	Hans P. Paar
	hpaar@ucsd.edu (e-mail)
	SERF 322A (office)
	858 246 0405 (office phone)
Teaching assistant:	Yury Kiselev
	ykiselev@ucsd.edu (e-mail)
	MH 5202 (office)
	858 242 9171 (phone)
Grader:	Thyagarajan Venkatanarayanan
	tvenkata@eng.ucsd.edu (e-mail)
Lectures:	Tuesdays and Thursdays 11:00 am - 12:20 pm in WLH 2205 (instead of CH 222)
	Wednesdays 5:00 pm - 5:50 pm in WLH 2113
Discussion sessions:	Tuesdays 5:00 pm - 5:50 pm in WLH 2205 (instead of CH 222)
	Thursdays 6:00 pm - 6:50 pm in York 4080A (except Thanksgiving)
Final:	Wednesday 12/9 from 11:30 am - 2:30 pm in WLH 2205
Office hour:	Fridays 2:00 - 4:00 pm in SERF 322A (instructor)
	Mondays 2:00 - 4:00 pm in MH 5202 (TA)
Course URL:	See Physics Department's website
Textbook:	Douglas C. Giancoli, Physics for Scientists and Engineers (2008)
	We will do Chapter 21 through Chapter 31-3

There will be homework assignments each week and tfour quizzes during the quarter. The first quizz is on October 14. The others are on October 28, November 18, and December 2. You are encouraged to work together on the homework sets. The homework will not be collected or graded. Some solutions will be posted in http://physics.ucsd.edu/~hpaar/4C/

COURSE OUTLINE

Physics 4C covers Electricity and Magnetism using multivariable calculus and vector calculus. We will cover Volume 2 Chapter 21-1 through Chapter 31-3 of the textbook listed above. If you have purchased the complete volume 1-3 of Giancoli you are in business. If you purchased Volume 1 Chapter 1 through Chapter 20 for Physics 4B you should buy Volume 2 rather than the complete volume 1-3 because (i) you already paid for Volume 1 and (ii) who knows which textbook will be assigned for Physics 4D and 4E.

The catalog states that Math 20C (Multivariable Calculus) is a prior requirement while Math 20E (Vector Calculus) may be taken concurrently with Physics 4C. We need the nabla operator from the beginning of the course and Gauss' and Stokes' theorems very soon thereafter. Math 20E starts with a review of multivariable calculus before introducing the nabla operator about halfway the course and Gauss' and Stokes' theorems toward the end. We can not wait that long before using the nabla operator so a brief document is provided to introduce it, see http://physics.ucsd.edu/~hpaar/4C/nablaoperatorclean.pdf. Especially students taking Math 20E concurrently with Physics 4C but also those that have already completed Math 20E

are urged to study this document carefully prior to the start of the Physics 4C course. The material staring in Section 6, Eq (19) will not be needed until Week 6.

Vector algebra is essential for the understanding of vector calculus. Another brief document is provided, see http://physics.ucsd.edu/∼hpaar/4C/vectoralgebraclean.pdf. Section 5 will not be needed until Week 6.

Gauss' and Stokes' Theorems will be introduced in class when the need for them arises.

COURSE SCHEDULE

The class schedule and homework assignments are listed below:

Week	Dates	Chapter	Homework
0	9/24-9/25	21	
1	9/28-10/2	21	7, 11, 13, 16, 32, 34, 40, 47, 48, 49, 58, 59, 62
2	10/5-10/9	22	4, 9, 10, 19, 20, 21, 24, 29, 31, 34, 38
3	10/12-10/16	23	3, 7, 15, 22, 26, 35, 51, 54, 61
	10/14		Quiz # 1
4	10/19-10/23	24	6, 15, 18, 27, 29, 31, 34, 44, 49, 58, 60
		25	7, 8, 9
5	10/26-10/30	25	12, 23, 32, 36, 39, 45, 49, 57
		26	12, 17, 19, 34, 38, 40, 46, 50
	10/28		Quiz # 2
6	11/2-11/6	27	6, 8, 16, 20, 23, 33, 35, 36
	11/11		Holiday
7	11/9-11/13	28	4. 7, 18, 19, 26, 28, 31, 34, 35, 37
8	11/16-11/20	29	7, 8, 11, 12, 20, 28, 33, 38, 48, 54
	11/18		Quiz # 3
9	11/23-11/27	30	3, 9, 12, 21, 24, 27, 34, 37, 46, 53, 65
	11/27-11/28		Thanksgiving
10	11/30-12/14	31-1,2,3	4, 6
	11/18		Quiz # 4 (Electrostatics only)
	12/9	Final	Location and time TBA

FURTHER INFORMATION

Quizzes will be closed book. All students are required to purchase bluebooks for taking quizzes. At the first quizz you will be assigned a 3-digit code number. Your assigned code number and course number (4C) should be written on the cover of your bluebook. Do not write your name on the bluebook for confidentiality reasons as the bluebooks will be returned together. Write your answers in ink, not pencil. You will not loose points when you cross out incorrect text. You will be able to collect your quiz at the end of a lecture. Solutions to the quizzes and grades by code number will be posted on the 4C webpage. Please check your grades promptly to make sure they are recorded correctly.

Appeals to the grading of the quizes should be made in writing within one week from the day the graded quizzes were returned. Do not write in the bluebook but rather attach a sheet of paper with your appeal and give it to the TA. Grade changes will only be considered if the quiz is written in ink, not when written in pencil. Contact the instructor if a problem is not resolved after a discussion with the TA.

The three quizzes with the highest scores will be counted toward the course grade so you can drop one quiz without penalty. Therefore there will be no makeup quizzes. In case of illness, documented with a letter from a physician or nurse, an accommodation will be made if more than one quiz is missed because of the illness.

The course grade will consist of 50% from the best three out of four quizzes and 50% from the Final. There will be no makeup Final so appraise yourself of the Final's date before making plans to leave town.

Please remind yourself of the "UCSD Policy on Integrity of Scholarship" in the UCSD catalog. I do not expect to encounter a problem in this area but if I do these rules will be strictly enforced.