Physics 104A, Methods of Mathematical Physics

Instructor  Rena Zieve  
Office: 243 Physics/Geology, 752-2510  
Lab: 230/232 Physics/Geology, 752-8049  
Office hours: 10-11 Monday, 9-10 Tuesday  
12-1 Wednesday, 3-4 Thursday  
E-mail: zieve@physics.ucdavis.edu  
Course web page: http://london.ucdavis.edu/zieve/phys104/phys104.html  
I will be in my office or lab during my scheduled office hours each week. 
You are welcome to find me for brief questions at other times. E-mail is by 
far the best way to get in touch with me.

(Second edition is OK too.)  
Other texts: Arfken and Weber, Mathematical Methods for Physicists  
Bradbury, Mathematical Methods

Prerequisites  Math 21ABCD, 22AB; Physics 9ABCD. If you haven’t taken all these 
courses, talk to me. Many of them will be helpful but aren’t strictly nec-
essary, so you may be able to take Physics 104 without having completed 
them all.

Grading  Homework 20%  
Problem sets will be due roughly once a week. If they are due on a day class 
doesn’t meet (to avoid conflicts with other physics courses), they should be 
turned in to my mailbox on the second floor of Physics/Geology by the time 
specified. Otherwise they are due at the beginning of class. Late problem 
sets will usually be accepted for half credit up to a specified deadline about 
two days after the intended due date. Others receive no credit. The lowest 
problem set grade will be dropped.

Midterm 30%  
There will be one midterm, on November 8.

Final Exam 50%  
The final will be on Saturday December 17 at 8 AM. Approximately three-
quaters of the final will test material covered after the midterm.
## Course Outline

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### 104C

A continuation class, 104C, will be taught in spring quarter of alternate years, as long as at least 8 students enroll. Physics 104C covers more PDEs, complex analysis (Boas Ch. 14), probability (Ch. 15 3rd edition, Ch. 16 2nd edition), discrete Fourier transforms, and one or two other topics depending on students' interests. Possibilities include tensors, group theory, and calculus in curvilinear coordinates.

### Problem Sets

My problem set questions and test questions for this class often have different styles. Sometimes a moderate or long calculation helps illuminate or reinforce a topic, so the problem sets do involve computation. On the other hand, on tests I want to probe your understanding of the concepts I've presented, rather than your ability to do algebra, so long calculations are rare. To help you prepare for the tests, I will list the main topics covered at the beginning of each problem set. In many cases I will also include extra test-style problems (labeled with a ‘T’) at the end, and state how much time I would allot for them. These ‘T’ problems need not be handed in. I strongly advise looking at them only after completing the rest of the problem set, and giving yourself only the suggested time. When you really understand a topic well, the ‘T’ problems usually seem easier than the rest of the problem set.

Students in the course have widely varying backgrounds in mathematics. I hope to give everyone a chance to learn and be challenged, so there is also a wide range of difficulty in the problem set questions. Don’t be too discouraged if you can’t answer quite all of them; if you can do the ‘T’ problems, you’ll do fine in the class.