Physics 116B Mathematical Methods in Physics Spring 2010

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Course Web Page

http://scipp.ucsc.edu/∼profumo/teaching/phys116B_10/phys116B_10.html

Class Hours

Lectures: MWF, 11:00 AM - 12:10 PM, Phys. Sc. 110
Discussion Section: Thursdays 5:30PM-7:00PM, E2 192

Course Description

- Fourier Series and Transforms
- Ordinary Differential Equations
- Calculus of Variations
- Functions of a Complex Variable

Prerequisites

- Physics: 5A/L, 5B/M, 5C/N, 116A
- Mathematics: 23A, 23B

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Required Textbook (on reserve)

- *Mathematical Methods in the Physical Sciences* by Mary L. Boas

Other Introductory Textbooks

- *Mathematical Methods for Scientists and Engineers* by D. A. McQuarrie
- *Essential Mathematical Methods for Physicists* by G. B. Arfken and H. J. Weber

Course Outline

Fourier Series and Transforms	Boas, Chapter 7	Mar 31 – Apr 7
Ordinary Differential Equations	Boas, Chapter 8	Apr 9 – Apr 30
Calculus of Variations	Boas, Chapter 9	May 5 – May 12
Functions of a Complex Variable	Boas, Chapter 14	May 14 – May 28
Course Review		Jun 2 – Jun 4

Course Grading and Requirements

Student evaluations will be based on their performance in the following four tasks. The tasks and their relative weights in determining the students' overall course grades are given below:

- **30%** Weekly Homework (9 problem sets)
- **10%** Collaborative Learning Problems in Discussion Sections
- **20%** Midterm Exam (Friday, April 30, 2010, 11:00 AM – 12:10 PM)
- **40%** Final Exam (Monday, June 7, 12:00 PM – 3:00 PM)

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Weekly homework assignments will be handed out each Friday and are due at the beginning of class on the Friday of the following week. The homework problem sets are (effectively) not optional, and will consist of a few problems from Boas' textbook. You are encouraged to discuss the class material and homework problems with your classmates and to work in groups, but all submitted problems should represent your own work and understanding. Late homeworks can be submitted to the grader, but will not contribute any points to the final grade. The Grader will grade each homework, and is responsible for the given grade. Homework solutions will be made available on the course website each due date.

A few problems will be assigned at each discussion section to groups of 3-4 students (collaborative learning), coordinated by the teaching assistant. Grading will be given to those present to the discussion section. Under special circumstances, students can get the collaborative learning discussion section assignments in advance and turn them in to the Teaching Assistant if they cannot attend the section.

The midterm exam and the final exam will be held in the same classroom as the lectures. The midterm will be a 1 hour written exam in class (regular lecture time) on Friday April 30th, on the material covered up to Wednesday April 28th, while the final, on June 7 at 12:00 PM, will be three hours long and cover the complete course material. Both the midterm and the final will be open-book (you can bring with you any book or notes), but only non-graphical, non-programmable calculators will be allowed (it will be to the discretion of the Instructor to decide whether a calculator is or not allowed). Laptop computers and cellular phones of any kind will not be allowed. A practice midterm and final will be handed out a week before the exams. You must take the final exam to pass the course.

The minimal score not to fail the class is 60%. The final evaluations will be as follows:

- 60% to 70%: **C** range
- 70% to 85%: **B** range
- 85% to 100%: **A** range