

Physics 475: Introduction to Mathematical Physics

Spring 2009

Lectures: Tuesday and Thursday, 12:30-1:50 p.m. in Small 238

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E-mail is my preferred communication method for any technical questions (to make an appointment, for example). I am usually very good about answering my e-mails promptly, but please write your e-mails under assumption that it may take a day or two for me to reply. Also I would like to strongly discourage any physics questions over the e-mail: it is much more efficient to discuss physics in person.

The grader for this course is Zhifeng Shi (zshi@wm.edu). He will be grading all the homework assignments. You should contact him only for grading questions.

Textbook information:

Required text: Mary Boas: *Mathematical Methods in the Physical Sciences*, 3rd Ed., Wiley.

Supplementary text: *Mathematical Methods for Physicists*, by George B. Arfken and Hans J. Weber, 4th Ed., Academic Press.

We will be using the Boas book extensively in the course; most of the HW problems are from this book. This book introduces many mathematical concepts needed for most undergraduate and introductory graduate physics courses at a somewhat “low-key” level. The text is clear and easy to follow. If you would like to see more general and more rigorous approach the book of Arfken and Hans is an excellent graduate-level mathematical physics textbook.

I also recommend finding a good reference handbook of integrals and tables (a real book or an electronic resource). For example, you may like Handbook of Mathematical Functions, With Formulas, Graphs, and Mathematical Tables (AMS55), edited by Milton Abramowitz and Irene A. Stegun. This book is in the public domain, and you can download a copy for free: <http://www.math.sfu.ca/~cbm/aands/>. Another good web-site is <http://mathworld.wolfram.com/>.

For some of the homework problems you will need a high level mathematics application such as Maple, Mathematica, MathLab, etc. to make plots. The College and Physics Department has licenses for some of these on their computer systems, but the student price for these programs are a bargain, and well worth the investment. They are also a good way to double-check your calculations.

Homework: There will be 10 homework assignments during this course (see attached schedule). All homework is due 5 p.m. on Friday. Every homework will consist of 10 problems (usually from Boas), and one optional extra-credit problem. The extra-credit problem is typically more challenging – and more interesting to solve. Late assignments will be accepted with a 50% penalty when submitted on or before the class meeting following the due date. Any assignment turned in after the class meeting will not be accepted (unless you obtained a permission form from me beforehand).

Grading: There are two in-class midterm tests (see course schedule) and one final exam. Total grades will consist of homework grade (25%), two midterm tests (25% each), and the final exam (25%).