

## PHYSICS 434 & 534 METHODS OF MATHEMATICAL PHYSICS – *Winter 2009*

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<http://web.pdx.edu/~arice/mathmethods/434534.htm>

**Credits:** 4

**Instructor:** Andrew Rice, 472 Science Building 2, arice@pdx.edu, 503-725-3095

**Office Hours:** Monday 2-3PM, Wednesday 2-3PM, Thursday 3-4, and by appointment.

**Lectures:** Monday, Wednesday, Friday 12:45-1:50

**Location:** 101 Science Building 2

**Required Textbook:** *Mathematics for Physicists*, Susan M. Lea, 1<sup>st</sup> Edition (Brooks, Cole)

**Text on reserve:** *Mathematical Methods in the Physical Sciences* Mary L. Boas

**Homework:** There will be 6 homework assignments. Assignments are passed out during class time and are due one to two weeks after they are assigned at the beginning of class. Most problems will be directly out of the book. Some problems may require outside reference physics material. Assignments and solutions will also be posted on the website. Lowest homework set will be dropped from the final grade. Late homework will be marked off at 25% per day.

**Exams:** Exams will be open book, closed note. There will be no make-up exams. No calculators allowed.

**Midterm:** Wednesday February 11, 12:45-1:50

**Final:** Monday, March 16, 12:30-2:20

### **Grading**

Homework 40% (lowest homework will be dropped)

Midterm 25%

Final 35%

### **Pre-requisites:**

Physics 201–203/211–213: General physics

Physics 311-312: Modern physics

Mathematics 251–253: Calculus I-III

Mathematics 256: Differential equations and multivariate calculus

Mathematics 261: Linear Algebra

**Academic Honesty:** ‘Academic honesty is a cornerstone of any meaningful education and a reflection of each student’s maturity and integrity. The Student Conduct Code, which applies to all students, prohibits all forms of academic cheating, fraud, and dishonesty. These acts include, but are not limited to, plagiarism, buying and selling of course assignments for other persons, unauthorized disclosure and receipt of academic information, and other practices commonly understood to be academically dishonest’ – Portland State University Bulletin, General Catalog Issue, Vol. 40, No. 4, 2006-2007.

**Course Description** - A survey of methods of applied mathematics used in modern physics, to include: vectors, matrices, operators, and eigenvalues; tensors; complex variables and complex analysis; Delta function and Green’s function; Fourier series; and Fourier transform.

*Ordinary language is totally unsuited for expressing what physics really asserts, since the words of everyday life are not sufficiently abstract. Only mathematics and mathematical logic can say as little as the physicist means to say* - Bertrand Russell