

**PHYSICS 434 / 534 METHODS OF MATHEMATICAL PHYSICS**  
**Winter 2016**

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**Instructor:** Andy Martwick, [andy.martwick@intel.com](mailto:andy.martwick@intel.com), text & voice 503-333-8285

**Grader:** Aaron Maroni, [maroni@pdx.edu](mailto:maroni@pdx.edu)

**Office Hours:** SRTC-B1-79A, MW after class or other hours by arrangement

Class: MW 10:00-11:50, University Pointe 207

**Course Description** –This class is a survey of methods of applied mathematics used in physics, to include: series, vectors, matrices, operators, and eigenvalues; tensors; complex variables and complex analysis; Fourier series;

The main theme of this class is the study of orthogonal vector spaces.

**Required Textbook:** Mathematical Methods for Physicists, Seventh Edition, Arfken, Weber and Harris

**Homework:** There will be approximately 6 homework assignments. Assignments will be sent by email as a PDF. They are due one to two weeks after they are assigned at the beginning of class. Some problems may require outside physics reference material. All homework counts.

**Late Homework:** Unless previously arranged, late homework will be marked off 25% per day.

**Exams:** Exams will be open book. One page of (8 ½ x 11) notes is allowed. No calculators, no cell phones, no smart watches. Exams will be based on the homework.

**Grading**

Homework 40%    Midterm 30%    Final 30%

**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

**Absence due to sickness** –You will not be penalized for illness-related absences or unforeseen emergencies. If this occurs contact me via email, text or call as soon as practical.

**Course Outline -**

Chapter 1 – Series, expansions, dirac delta, Levi-Civita.

Chapter 2 – Determinants / Matrices

Chapter 3 – Vector Analysis

Chapter 4 – Tensors

Chapter 5 – Vector space

Chapter 6 – Eigenvalue equations

Chapter 11 – Complex analysis

Chapter 19 – Fourier Series