Mathematical Methods of Physics I

Physics 330

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1 General Information

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This is a one quarter course aimed at providing beginning graduate students with a basic background in mathematical physics. The grading for the course will be determined from weekly problem sets, possibly a midterm, and a final exam.

2 Course Outline

2.1 A tentative list of topics

Mathematical physics is a vast and fascinating subject. A partial list of topics that we will try to cover includes:

ODEs,
Complex analysis,
Special functions,
Linear algebra,
Integral transforms,
Sturm-Liouville systems,
PDEs.

2.2 Some useful references

The primary course text is Mathews and Walker, "Mathematical Methods of Physics." Other useful references include:

Arfken and Weber, "Mathematical Methods for Physicists."
Carrier, Krook and Pearson, "Functions of a Complex Variable."
Jackson, "Classical Electrodynamics."
Gradshteyn and Ryzhik, "Tables of Integrals, Series and Products."
Bender and Orszag, " Advanced Mathematical Methods for Scientists and Engineers."