

Mathematical Methods of Physics I

Physics 330

Savdeep Sethi

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1 General Information

Email: sethi@theory.uchicago.edu

Phone: 4-4434

Office: EFI 270

Website: <http://theory.uchicago.edu/~sethi/Teaching/P330-F2007/classes330.html>

Grader: Michael Seifert

Location & Time: KPTC 105, MWF 11:30-12:20

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.”
- Ablowitz and Fokas, “Complex Variables: Introduction and Applications.”
- 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.”