

Mathematical Methods of Physics

Physics 221

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1 General Information

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Grader: Andy Royston

Location & Time: KPTC 105, MWF 10:30-11:20

This course will serve as an introduction to the mathematical methods used in physics. It will be aimed at sophomore physics majors who have taken Physics 143 or both Physics 133 and Math 220. The aim of the course will be to develop a strong framework for the future study of quantum mechanics, electromagnetism and advanced classical mechanics based primarily on linear algebra. There will be weekly problem sets ($\sim 40\%$), a mid-term ($\sim 25\%$) and a final examination ($\sim 35\%$).

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:

Linear Algebra,

ODEs,

Green's functions,

PDEs,

Perhaps some complex analysis,

Perhaps some tensor analysis.

2.2 Some useful references

The primary course text is Boas, "Mathematical Methods in the Physical Sciences" though most of the course will be taught from lecture notes. Other useful references include:

Arfken and Weber, "Mathematical Methods for Physicists."

Mathews and Walker, "Mathematical Methods of Physics."