

Physics 695: Topics in Physical Mathematics, Fall 2015

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ABSTRACT: June 14, 2015

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1. Prerequisites

This course is primarily intended for advanced undergraduate and graduate students in physics intending to specialize in theory. There will be some bias towards particle theory, although there is much here that is useful to the nuclear and condensed matter theorist. It should also contain much of interest to the mathematics student with some interest in physics.

I will assume you have some knowledge of basic group theory, representation theory, topology and differential geometry. If there is any background I am assuming which you do not know do not hesitate to ask and we will cover it.

2. Tentative Plan

The basic plan will be to cover several different topics in Physical Mathematics. There is much more material here than can be covered in one semester (or even five semesters) so some choices need to be made.

I will assume knowledge of basic manifold, cohomology and bundle theory. I am quite happy to go back and review any of this material.

See the accompanying link for a detailed outline of possible topics.

3. Administrative

1. We will have an initial meeting to decide on which of several possible topics we should cover. This meeting will be at 10:20am in Serin E385 on Tuesday September 8, 2015.
2. The course is scheduled to meet Mondays and Thursdays 10:20am-11:40am. If possible we might change the time to a mutually acceptable period.
3. Notes for all the lectures will be handed out or posted on the web page for the course.

4. The grade for those taking the course for credit will be based on a short paper and possibly a presentation given at the end of the semester. I will hand out topics towards the middle of the course.
5. I will probably not hand out problem sets to be graded. However, the lecture notes contain plenty of exercises. You are encouraged to do them.
6. As a courtesy to others, PLEASE DO NOT EAT OR DRINK DURING CLASS. You may bring a water bottle.
7. Please note: Attendance at the lectures IS NOT OPTIONAL. If you are a true genius and do not need to hear the lectures to write a brilliant term paper, then you are excused. Please be aware that I will then judge your term paper by those standards.