Physics 231: **Methods of Theoretical Physics**

Instructor:	Flip Tanedo	Room:	Chung 139
Contact:	flip.tanedo@ucr.edu	Lecture:	MWF 10:10am – 11:00am
Office:	Physics 3054	Office Hour:	M 3:30pm – 4:30pm

Up-To-Date Information

Course webpage: http://physics.ucr.edu/~flip/teaching/p231_2017/
Lecture notes and homework will be posted there. Grades will be posted on `iLearn`.

The TA is Ian Chaffey, who will primarily handle grading. We will have *no discussion section*, there will be optional office hours during that time instead.

Unofficial Course Description

This is a crash course in mathematical methods in physics and their applications. The course covers a range of topics that will either be useful in your graduate coursework and research or are topics that every physicist should know something about. Rather than being deep and general, the course is broad and applied: this is not a mathematics course, this is *boot camp* for physicists. The 2017 version of this course will focus on statistics in physics.

Evaluation

Weekly homework assignments. No exams. I expect you to work together and to abide by the UCR academic integrity policies.

Textbook

No required textbook, though I recommend having a mathematical methods reference handy. Some suggestions are on the course webpage.

Topics

I reserve the right to update this as necessary. Leftover weeks are for make-up lectures.

1. **Dimensional analysis**. [1 week] How to tell a physicist from a mathematician.
2. **Differential equations as linear algebra**. [5 weeks] Linear algebra review, functions as linear spaces, ordinary and partial differential equations, Green's functions, complex analysis review, contour integrals. This is the 'standard' math methods core.
3. **Practical Statistics**. [4 weeks] Distributions, probability and confidence, Bayesian inference, figuring out when you've discovered something.