

# Foundations of Nanoscience (PHYS 1375)

Spring 2018

MWF 3:00-3:50 PM, Allen 106

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Office Hours: TBD / by appointment

## Course Description

This course provides an introductory overview of the scientific issues that arise when we attempt to study / create physical systems at nanometer length scales. The majority of the course will cover basic physics concepts such as quantum mechanics, electromagnetism, and statistical mechanics and how these concepts shift when the length scale and number of atoms involved become very small.

The final ~ third of the course will cover methods available in modern fabrication facilities to manipulate and characterize nano-scale systems, as well as special topics on nano-systems of interest to the class.

## Course Text:

I strongly recommend **Introduction to Quantum Mechanics** by David Griffiths (any edition will be fine). We will have sections of older textbooks online as well, but Griffiths is very readable and much more modern. Also, you will use it in your Quantum Mechanics class later.

## Homework (65 % of total grade)

Homework will be assigned approximately weekly. Each assignment will be given with a due date. Assignments submitted more than one week past the due date will not be graded or receive credit.

## Final Project (35 % of total grade)

At the end of the semester, each student will give an oral presentation 15 min. long on a topic mutually agreed upon by student and professor. It will be accompanied by a 3 pg. written report (not including figures) on the same topic. The report will be typeset in Tex to ensure readability and clarity of equations and scientific notation. Additionally, both oral and written components must properly cite and credit sources. Projects will be selected ~ week 8 of the course, and must be submitted as one paragraph abstracts before Spring Break. I strongly encourage those already doing physics research to pick a topic outside their direct research experience.

## **Student Opinion of Teaching Surveys**

Students in this class will be asked to complete a *Student Opinion of Teaching Survey*. Surveys will be sent via Pitt email and appear on your CourseWeb landing page during the last three weeks of class meeting days. Your responses are anonymous. Please take time to thoughtfully respond, your feedback is important to me. [Read more](#) about *Student Opinion of Teaching Surveys*.

## **University Policies:**

### *Academic Integrity*

Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, from the February 1974 Senate Committee on Tenure and Academic Freedom reported to the Senate Council, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz or exam will be imposed.

View the complete policy at [www.cfo.pitt.edu/policies/policy/02/02-03-02.html](http://www.cfo.pitt.edu/policies/policy/02/02-03-02.html).

### *Disability Services*

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-624-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course. For more information, visit [www.studentaffairs.pitt.edu/drsabout](http://www.studentaffairs.pitt.edu/drsabout).

## **Statement on Classroom Recording**

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.