

Physics 302: Teaching and Communicating Physics

Spring 2014

Syllabus

January 29/30, 2014

Synopsis

Purpose This course is a *practicum*: Its purpose is to provide physics graduate students with a low-pressure, practice-based environment in which to develop and improve their teaching, presentation, and communication skills. The course consists of a mixture of short presentations by instructors and outside speakers, combined with significant hands-on practice for enrolled students.

Enrollment Enrollment in the course is mandatory for first-year physics graduate students. Official enrollment is ordinarily capped at thirty-six, with priority given to first-year graduate students.

Auditors Auditors of any number are welcome as well, and may attend the full meetings as well as provide additional feedback during the small-group practice sessions. However, auditors will not generally have an opportunity for practice teaching.

Methods The course focuses primarily on in-class teaching and presentation practice. Enrolled students have abundant opportunities to practice in small groups in the presence of both course instructors and auditors, observe the practice teaching of other students, receive and share feedback, and discuss teaching methods and approaches.

Goals The broader goals of this practicum are to inform graduate students about the rules and regulations of teaching at Harvard, as well as to improve the overall quality and effectiveness of teaching in the department. Additionally, this course aims to help its participants improve their lesson planning, presentation, communication, active engagement, discussion leading, board usage, awareness of audience, and confidence.

Note: The Harvard School of Engineering and Applied Sciences (SEAS) also offers a teaching practicum—[Computer Science 365: SEAS Teaching Practicum](#)—and SEAS students should enroll in that course if their schedules permit. For a list of all teaching practicums and seminars available at Harvard, please [click here](#).

Primary Instructors

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Schedule

Each enrolled student attends ten sessions that meet weekly, 4:00pm - 6:00pm. (See the tentative agenda for specific session dates and topics.)

At the beginning of the term, enrolled students sign up to attend their ten sessions either on Wednesdays or Thursdays—official total enrollment for the course is ordinarily capped at 36, with a maximum of 18 students for each day and exceptions made as needed. Graduate students beyond the capped enrollment are invited to audit the class and attend both the full-meeting presentations as well as the small-group discussions, although they will not generally get a chance to practice teach.

Most class periods are divided approximately between

- 15-30 minutes of presentations by instructors or outside speakers, including full-meeting discussions; and
- 90 minutes of practice-teaching sessions emphasizing the current topic—10 minutes of teaching per officially-enrolled student, with 5 minutes of group follow-up discussion with instructors and other graduate students.

Grading

All first-year physics graduate students are required to enroll, and official total enrollment is capped at 36 graduate students, who receive a grade of SAT/UNSAT. There is no formal homework—attendance, preparation for each session, and full participation are required for a passing grade. Graduate students beyond the capped enrollment are welcome to audit the course.

Note: Completion of this practicum counts toward the [Bok Center Teaching Certificate](#).

Outside Reading

Required

- *Resources for Teaching Fellows, 2013-2014 (GSAS)*
http://gsas.harvard.edu/teaching_fellows/resources_for_teaching_fellows.php
(Available as a convenient single PDF for enrolled students on the course web site)

Optional

- *The Torch or the Firehose: A Guide to Section Teaching (Arthur P. Mattuck)*
<http://isites.harvard.edu/fs/html/icb.topic165073/default.html>
(Available as a convenient single PDF for enrolled students on the course web site)
- *How People Learn (especially Chapter 2)*
http://books.nap.edu/catalog.php?record_id=9853
(A summary of research on cognition—the mind, the brain, and the process of learning)

- *Inquiry and the National Science Education Standards*
http://www.nap.edu/catalog.php?record_id=9596
(A guide to teaching and learning using scientific inquiry)
- *Five Easy Lessons: Strategies for Successful Physics Teaching*
http://www.amazon.com/Five-Easy-Lessons-Strategies-Successful/dp/0805387021/ref=sr_1_1?ie=UTF8&qid=1320167203&sr=8-1
- *Teaching Physics with the Physics Suite, Chapters 1-3 (Edward F. Redish)*
<http://www2.physics.umd.edu/~redish/Book/>
- *How Learning Works: Seven Research-Based Principles for Smart Teaching (Susan A. Ambrose)*
<http://www.amazon.com/dp/0470484101>