Statistics 303hf
The Art and Practice of Teaching Statistics
Department of Statistics and Derek Bok Center for Teaching and Learning
Harvard University
2019-2020

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Office Hours: by appointment

Class Meetings

Meetings are from 3-5pm on those Tuesdays specified in the schedule. Class will begin at 3pm sharp.

This will be a year-long course, usually meeting in Science Center 706.

Course Related Web Pages

For general course information and updates, please refer to the course web page:
https://canvas.harvard.edu/courses/57952

For teaching-related questions and other useful resources, please refer to:
https://bokcenter.harvard.edu/

Goals and Prerequisites

The goal of this course is to help you become a good teacher and an effective communicator. There are several by-products of being a good teacher. If you master the art of teaching, and in particular, teaching Statistics, you will not only become successful in your teaching career but also an excellent presenter, acquiring effective communication skills and easing any stage fright you might have. Good communication skills, both orally and in writing, are essential in your professional and personal life, no matter what career goals you have set.

As some of you have come from different educational and cultural backgrounds, we understand that you may consider teaching in an American classroom a challenge. We are here to supply the necessary tools and techniques to help you meet this challenge. Equipped with what you learn in this course, you will look forward to your first class as a Teaching Fellow.

Over the course, you will be given numerous opportunities to practice teaching as well as writing. Through suggestions and comments from the teaching staff and peer reviews, you will gradually learn what works well in the classroom (and what doesn't). If you consciously make an effort to follow these guidelines in the classroom, we are confident that you will be appreciated and recognized as an excellent TF by your students.

All first year Statistics Ph.D. students are required to take this course. Others who are interested in taking the course may talk to the instructors. There is a cap on the number of students allowed to take this course for credit. Therefore, the instructors reserve the right to decide individual enrollments on a case-by-case basis.

Texts and References

For presentation material, here are two free online textbooks to find source material:

- ***"OpenIntro Statistics"*** by David Diez, Mine Cetinkaya-Rundel, and Christopher Barr:
  - https://www.openintro.org also has other open resources (including two other texts) for teaching statistics
- **STAT 110** Textbook ("***Introduction to Probability"*** by Joseph K. Blitzstein and Jessica Hwang):

For interesting examples and activities: "***Teaching Statistics: A Bag of Tricks,"*** by Andrew Gelman and Deborah Nolan, an excellent reference for a Statistics TF. This book will be on reserve in the library and is also available online (for free) via Harvard Hollis.

Course Requirements

- Active participation in every class meeting is expected and encouraged.
- You will complete small writing assignments before and/or after some of the sessions; see the schedule for details.
- You will give three practice presentations during the Practice Teaching sessions in the fall and one in the spring; following this, you will teach a day of an actual section.
- You will be required to visit the session of an experienced TF early in the fall semester and report your observations.
- You will be required to hold one hour of office hours for an intro level class in the fall.
- You will meet individually with Nicole/Sanqian occasionally to view and discuss your teaching videos.

Class Expectations

We expect everyone in this course to actively participate and engage in the classroom. We also expect everyone to work towards a supportive environment where we can all improve our teaching abilities and be open to hearing different view points. To that end, we expect that you will treat everyone else, whether it is a classmate or a TF whose section you are attending, with

respect. We also expect that criticism (since we all need to improve in someway) will be constructive, polite, and well intentioned.

Maintaining a course notebook

You will be expected to keep a dedicated notebook throughout the year, where you will reflect on course topics at the beginning and end of each class. This can be either an electronic notebook (recommended to make submitting assignments easier) or a paper notebook and should be brought to every class. The notebook is ultimately for *you* to keep a record of your thoughts, experiences, questions, and concerns about teaching and communicating statistics, but from time to time you may be asked to submit passages or logs for course credit.

Your Comments and Suggestions

We always welcome your comments or suggestions. Please feel free to tell us your opinions about any aspect of the course. Email is the most effective way to get in touch with us. You can also write us an anonymous note and drop it in our mailboxes, located on the 7th floor of the Science Center.

FALL 2019-2020 Schedule

Date & Location	Topics	Assignments (to be completed **prior** to class unless otherwise stated)
9/3/19 SC 706	**Introduction & Practice Teaching I** The teaching staff will present an overview of the course. Participants will be asked to share past teaching experiences and general ideas about teaching. The class will also feature other activities designed to uncover challenges each student may face in teaching.	*After the first class, write a brief paragraph describing your concerns about teaching and what you want from the course. This will be the first entry in your course notebook.*
9/10/19 SC 706	**Inclusion, Diversity, and the Undergraduate Perspective** This week we will discussing the topics of diversity and inclusion in the classroom. We will also be discussing undergraduate life at Harvard, both in and out of the classroom, and how that impacts students' learning experience with statistics undergraduate TFs to share their experiences.	*Read the Harvard Magazine article, "the twenty first century student." To what extent is the Harvard undergraduate life similar to, or different from, your own experience as an undergraduate?* *As you go through the content, please think of two questions you would like to ask the Harvard undergraduates, about their daily lives and their experiences in statistics sections.*
9/24/19 SC 706	**Section Observation Discussion** Each student will describe examples of good teaching and missed opportunities, and will report their observations from visiting sections. We will also spend some time to discuss preparing for the very first section.	*Attend a STAT 110 section and note what you did and did not think was effective and anything else you find interesting or surprising during the section.*
10/15/19 SC 706	**Practice Teaching II** Each student will present for 10 minutes (including questions), followed by 5-minute class discussion.	*Choose a topic from the options given and prepare a 7-10 minute presentation. Use of the board is mandatory for this assignment. Presentation aimed at STAT 110 students.*
10/22/19 SC 706	**Office Hours & Effective Teaching Strategies; Dealing with Hard Questions** We will discuss challenges that occur during section and how to deal with difficult questions. We will also act out different challenging scenarios that TFs might face.	*Help at a STAT 110 (possibly another class) office hour for one hour. By the end of Sunday (10/20/19), complete the following and email them to Nicole and Sanqian:* *1) write a paragraph describing your experience at the office hour;* *2) a couple of difficult questions that you were not sure how to answer during the office hour.*

11/05/19 SC 706	**Practice Teaching III** Each student will present for 15 minutes, followed by 5-minute class discussion.	*View the practice teaching II video with Nicole and Sanqian. Prior to this, view Sanqian's video and provide feedback in the discussion on Canvas. Also prepare a 15 minute presentation with slides. Send slides to Nicole and Sanqian by the prior Thursday (1031/19) and revise based on comments after. Presentations intended for statistical novice audience.*
11/26/19 SC 706	**Mid-year Review and Reflection** Review of the semester with discussion and tape-viewing. Discuss lessons learned and any new concerns or suggestions. We will also continue discussing the topics of diversity and inclusion in the classroom, with a presentation from the Bok Center Undergraduate Pedagogy Fellows.	*Write a paragraph summarizing what you have taken away from this semester of the course and send it to Nicole and Sanqian. Also, revisit your paragraph submitted prior to the first class; how have your concerns about teaching changed (or not changed) since then?* *Also take some time to read this webpage about diversity&inclusive teaching. As you go through the content, please think of one question you have about diversity or inclusion in the classroom to ask the Undergraduate PFs.*

SPRING 2019-2020 Schedule (Tentative)

Date & Location	Topics	Assignments (to be completed **prior** to class)
2/11/20 SC 706	**Teaching coding and interactive topics** We will have guests in to talk about effective ways to teach code and the use of data visualizations in the classroom. We will also spend some time to discuss section design.	*Write 1,000 words about a statistical concept (the topic you taught on Nov 05 19) for a novice. Email to Nicole and Sanqian by Sunday, February 9, 2020.*
2/25/20 SC 706	**Presenting coding demos or visualizations** Each student will spend 10-15 minutes presenting their code demo or data visualization example.	*Edit your 1,000-word based on feedback and email it to Nicole and Sanqian by Sunday, February 23, 2020.* *Prepare a 5-10 minute presentation on either a demo of a specific use of R (e.g. writing a function or using a specific package) or on a data visualization.*
3/24/20 SC 706	**Practice teaching IV** Each student will present for 20 minutes, followed by 5-minute class discussion. Undergraduates and/or facilitators will attend this session.	*Prepare a 20-minute micro-teaching based on what will be taught in STAT111.*
3/31/20 SC 706	**Grading, Confidentiality, & Academic Honesty, and discussion with Experience TFs** We will discuss a range of different topics related to teaching responsibilities beyond the classroom. We will invite a Bok Center staff member to discuss with us and will hear from a few current TFs.	*What do you think are the biggest issues that teaching fellows face in the classroom? In your course notebook, come up with a list of difficult scenarios that could arise as a TF and think about how you would address those issues. Come to class prepared to discuss.*
Weeks of 3/30/20 - 4/10/20	**Practice Teaching V: Teach an actual section!**	*Immediately after teaching, write 1-2 paragraphs about what you think were the strengths and weaknesses of your section and send it to Nicole and Sanqian before meeting with one of them to discuss.*
4/14/20	**Year Long Reflections** We will reflect on what we have learned in the courses, skills we have developed, and things we still want to work on. Time to discuss other concerns or any material we did not have time for. May invite current TFs to give general advice.	*Write a paragraph summarizing what you have taken away from this course as a whole and send it to Nicole and Sanqian. Also, revisit your paragraph submitted prior to the first class and your reflections after the first semester; how have your concerns about teaching changed (or not changed) since then?*

4/28/20 SC 706	**Grand Finale** Over gourmet catering, the course closes with a grand finale, and students articulate what they learned from the course. Don't be surprised if there is a surprise guest speaker!	*Write a paragraph about what you think are the most important things you learned in Stat 303, and any concerns you still have, and send it to Nicole and Sanqian before class.*