

## Sta 771S: Undergraduate statistics curriculum

---

- Discuss the questions assigned to your team: 20 mins.
- Prepare a very brief presentation that summarizes the key points of your discussion: (2-3 mins).
- Lead a discussion on your topic: 5 mins.

Tentative teams are noted below. Team assignments might be updated if there are absences.

---

### Team 1: Michael, Willem, Shaobo, Ken

1. What are possible shortcomings of flattening prerequisites for statistics courses?
2. Cobb discusses some concerns about prerequisites. Even though introductory classes can be designed to be practical or real data based, how do we backup the teachings with the "necessary" mathematical proofs, to students who lack the required background? Or is he arguing that those proofs are not as relevant or important at the introductory level? Would that imply that we could defer those to more advanced statistics classes?
3. The article indicated that data manipulation and computation, computer programming, statistical practice are also important aspects especially for statistics majors hired into analyst positions. How much weight should the teaching of statistical methods and theory be put in the curriculum?
4. My undergraduate statistics classes were mostly math-based and theoretical, without a lot of emphasis on data. It worked out for going to grad school, but I did feel less prepared when I started working with real data sets. Did other people have similar experiences?
5. Cobb paper talks a lot about removing the math barriers from statistics. How can statistics be made separate from math? How important is math for an undergraduate major with no plans of going to graduate school? What if statistics majors required a second (context) major?

### Team 2: Kyle, Mao, Christine

1. The guideline suggests dropping some courses or topics in the current curriculum to be able to accommodate some data science topics. How do we make those decisions? What are examples of some topics in introductory classes that we think can be dropped?
2. Since almost any college student can receive training in data science through taking STA101, what makes a statistics major stand out in the job market?
3. How can we reconcile research and curriculum in a way that promotes understanding of statistics in solving real world problems?

4. How can we construct effective classes when a good portion of us are not problem solvers? (By not problem solvers, I mean theoretical statisticians, in the data science sense, of course.)
5. Cobb asks to rethink the undergraduate statistics curriculum and seems to mostly focus on students doing a major or minor in statistics. However, most undergraduates exposed to statistics education are not statistics major or minors. Nonetheless, most of Cobb's remarks extend to them (he even mentions statistics education in elementary school to show the universality of his argument). With that in mind, what should a single stats course mandatory for all first years look like?
6. Do we need to train students to code in the statistical software that industry prefers most from their first day of studying statistical courses? For example, we should encourage them to code in python instead of R to do homework for every stat course.

**Team 3:** Matt, Lu, Princeton

1. Cobb also introduces the idea of a research based first statistics course where each student learns through an individual research experience. In a class of more than 100 students, how feasible or effective would this be?
2. Can students really do research in elementary school?
3. In an introductory statistics course which requires students to work on a project, how does the instructor evaluate the student's proposal of research topic?
4. In the teaching through research activities, do you think it is too risky to let students conduct brand new research? After all, research skills have to be taught and developed step by step. Perhaps it is more controllable to ask students to work on old, classic research problems, as we are doing currently.