

**STAT 410 – Statistics Education: Pedagogy, Content, Technology,
Assessment**

Fall 2015

1. Catalog Description

STAT 410 Statistics I (4)

Topics related to content, pedagogy, technology, and assessment for teaching statistics in grades 6-16 in accordance with current standards and research for teaching statistics including the Common Core State Standards for Mathematics. Prerequisite: Introductory statistics course

2. Required Background and/or Experience

STAT 130, STAT 217, STAT 218, STAT 251, STAT 301, STAT 312, STAT 321, STAT 512 or STAT 542.

3. Expected Outcomes

The student should be able to:

- a) Describe current recommendations for teaching introductory statistics at 6th grade through college levels (e.g., Common Core Stat Standards for teaching statistics; NCTM Standards with respect to Statistics; ASA-endorsed GAISE Guidelines for PreK-12 and Undergraduate levels; AP Statistics);
- b) Contrast teaching statistics with teaching mathematics;
- c) Summarize and critique recommendations in the national and international statistics community about goals for student learning, the nature of statistical reasoning and thinking, recommended methods for teaching, and recent research on common misconceptions, best practices, and student attitudes;
- d) Use state of the art technological tools including statistical software, web applets, and simulation/re-sampling to help students learn statistics;
- e) Apply appropriate methods to assess student learning via performance assessment, student projects, and other assessment formats;
- f) Observe and critique a statistics classroom;
- g) Design active learning lessons that help students develop understanding of important statistical ideas;
- h) Design a lesson plan for a statistical topic, incorporating the guidelines, materials, and methods learned in this class.

4. Text and References

- Journal articles
- Gelman and Nolan, *Teaching Statistics: A Bag of Tricks*, Oxford University Press, 2002.
- Ben-Zvi and Garfield, *Developing Students' Statistical Reasoning: Connecting Research and Teaching Practice*, Springer, 2008.

5. Minimum Student Materials

6. Minimum University Facilities

7. **Expanded Description of Content and Method**

<i>Content:</i>	<i>Number of Lectures</i>
1) Teaching mathematics vs. Teaching statistics	2
2) Recommendations in Statistical Content	14
What education citizens should know, Common Core State Standards (by grade level), NCTM Principles and Standards	
3) Recommendations in Pedagogy	10
How students learn statistics, active learning, constructivism, GAISE guidelines, cooperative learning, flipped classroom	
4) Technology	4
Tinkerplots, Fathom, Statistical software, applets, design data and technology activity	
5) Assessment	4
Assessment design (e.g., exam questions, projects) and developing an assessment plan	
6) Resources	2
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Total	36

8. **Method of Evaluating Outcome**

Student learning will be assessed through reflection papers, participation in class discussion, oral presentations, projects, lesson plan, final exam