Statistical Consulting and Collaboration

STAT 582/515 - Spring 2018

M, W, F 1:30-2:20 UNIV 017

Instructor Bruce A. Craig
Office 250 MATH
Office Hours T 11:00-12:00, R 4:00-5:30, or by appt
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Course Webpage http://www.stat.purdue.edu/~bacraig/stat582.html

Course Objectives: To emphasize and develop the skills needed to be an effective statistical consultant and collaborator. Topics include problem solving skills, meeting and time management, written and oral communication, research ethics, design of experiments, the collection of data, and application of statistical methods to address real problems.

Course Description: This course is unique in that it is both a one credit (STAT 515) and three credit (STAT 582) course. Class activities include participating in consulting sessions held by the Statistical Consulting Service (STAT 582 only), homework, in-class and take-home small group projects, two week-long individual projects, and oral presentations.

Prerequisites: This course is a required course for the Department of Statistics Applied Master’s program. An Applied Master’s student typically takes this course during the fourth semester in part to prepare for the Applied Master’s exam. As a result, it is expected that all enrolled students will have taken a course in the design of experiments (e.g., Stat 514) and linear models (e.g., Stat 525).

Course Textbook: There is no required text for the course. A set of course notes and list of references will be provided on the course webpage during the semester.

Breakdown of Grade: The final grade is based on a combination of homework (25%), written and oral presentations of real-world projects (50%), and class/group participation (25%). Since the goal of the course is to develop skills, improvement in these skills during the semester will also be a factor. There will be no formal exams. The usual percentages of 90%, 80%, 70% etc. will be used for end-of-the-semester letter grades. I do include plus and minus grades.

Homework: Homework will be handed out at least a week in advance to work around potential conflicts. Due date exceptions may be arranged if discussed at least four days in advance. Homeworks cannot be made up and are awarded 0 points if not turned in on time and no alternative arrangements made. Expect around seven homeworks during the semester.

Attendance: Because there will be in-class projects, it is expected that you attend all classes unless the absence is discussed in advance. In the event of an unplanned absence, such as an illness, you are encouraged to contact me as soon as possible.
Emergencies: In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website.

Purdue’s Honor Pledge: As a boilemaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.

Important Dates:

- Mon. Jan 15th - NO CLASS - MLK Jr Holiday
- Fri. Feb 23th - NO CLASS
- Mar 12th, 14th, 16th - NO CLASS (Spring Break)
- Some additional M and F classes will be canceled and replaced with attendance at SCS meetings or individual consulting

Course Topics:

- Interpersonal dimensions of statistical consulting
  - meeting skills
  - effective questioning techniques
  - communicating statistical concepts and results
  - non-verbal communication
  - negotiation and conflict resolution

- Written and oral presentations
  - report styles and writing skills
  - presentation organization and style
  - communicating statistical concepts and results

- Problem solving dimensions of statistical consulting
  - formulation of statistical hypotheses
  - design of experiments (e.g., randomization, replication)
  - power and sample size calculations
  - methods of analysis (e.g., mixed models, generalized mixed models)
  - numerical and graphical presentations

- Research ethics

- Human subject protections (DSMB / IRB)