Course Title and Number: Statistical Consulting
ABE 688, STAT 688, CPH 688

Description of Course
The goal of this course is to teach statistics students to be effective statistical consultants. This is an advanced course requiring statistical and scientific maturity. This course will provide students with the ability to effectively and accurately acquire and convey information in verbal and written presentations. The course also describes selection and use of tools and statistical methods to analyze and interpret scientific, business and medical studies.

Locations and Times
Lecture, discussion and client meeting review – Wednesday, 2:30 pm – 5:20 pm.
Consulting meetings, TBD

Instructor Information
Dean Billheimer
Associate Professor of Biometry
Directory, Arizona Statistics Consulting Laboratory
Agricultural and Biosystems Engineering
Room 225 Thomas W. Keating Bioreserch Building
Telephone: (520) 626-9902
e-mail: dean.billheimer@arizona.edu
Office Hours: TBD
Teaching assistants: TBD
Website: http://statlab.bio5.org

Alternate Contact
Ms. Juil Riemenschneider
Telephone: (520) 626-2770
Email: jriemen@email.arizona.edu

Course Prerequisites:
Graduate Level:
Statistics: Probability & Math Statistics sequence (STAT/MATH 564/566)
Regression Analysis (STAT/MATH 571A) / ALT. CPH 576B
Experimental Design (STAT/MATH 571B, or equivalent)
Computing: Working knowledge of Stata, SAS, SPSS, or R (or equivalent)
Preferred: exposure to linear and generalized linear models

Course Objectives and Expected Learning Outcomes
1. Identify and practice communication styles to ensure accurate flow of information between the client and the statistical consultant.
2. Identify the needs of the client through various questioning techniques, select and apply appropriate methods of analysis, and effectively communicate results through oral and written presentations.
3. Practice statistical consulting in a real world setting.
Biostatistic Competencies:
Ability to identify appropriate statistical tools to address specific scientific questions
Ability to select appropriate research designs to meet the needs of various studies, and be able to explain the limitations of implemented designs
Ability to skillfully engage in statistical collaboration with mentors, colleagues, and clients
Demonstrate excellent presentation skills and the ability to explain statistical concepts and findings to a general scientific audience
Demonstrate skills in data management to handle a variety of practical problems in data format and structure
Demonstrate advanced working skills in application of computer systems and appropriate statistical software
Demonstrate advanced competencies in areas of professional expertise and scholarship enabling them to advance to further postgraduate study in biostatistics
Demonstrate understanding of methods of data analysis and data monitoring

Topics
Introduction to Statistical Consulting
Verbal, Written, and Presentation Communications
Negotiating a Satisfactory Exchange
Dealing with Difficult Situations
Anatomy of a Study
Methodological Aspects of Statistical Consulting
Grant Proposals and Manuscripts
Anatomy of a Study

Course Methodology
The course will consist of lectures, presentations from statistical consultants from the university and the community, meeting with university researchers in statistical consulting meetings, and weekly group discussions of consulting projects. (weekly 2 hours lecture, up to 2 hours meeting with consulting clients, 1 hour discussion)

Teaching Format
Student Centered Learning

Recommended Texts

Required or Special Materials
Access to modern computing with presentation, document preparation, and statistical analysis software.

Required/Recommended Knowledge
Effective communications techniques
Effective oral presentation skills
COURSE SYLLABUS CONTENT AND FORMAT

Effective written communication skills
Statistical knowledge consistent with course prerequisites

Grading Policy
The final grades are assigned according to the student’s completion of the following activities:

- Investigator Meeting Summaries – 40% (20% oral; 20% written)
- Consulting Project Reports (2) – 20%
- Class Participation – 40%

Attendance at lectures and consulting meetings, and class participation are key to success in this course.

Attendance Policy
All students are expected to attend lectures, discussions and assigned consulting meetings. A substantial portion of the course grade is based on participation in class discussions. If you are unable to attend a regularly scheduled consulting meeting, please arrange trading with a classmate. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean designee) will be honored.

Assignment/Testing Schedule/Due Dates
This course requires up to two weekly meetings with university researchers seeking statistical consulting assistance. Weekly verbal and written summaries of these meetings are required, and constitute 40% of the grade. In addition, students will write extensive reports for two of these projects during the semester. These extensive summaries constitute an additional 20% of the course grade.

Assignment Format
Students are encouraged to use methods of literate programming and reproducible research as described in class (e.g. R statistics language/LaTeX document preparation system/Sweave format. See http://biostat.mc.vanderbilt.edu/twiki/bin/view/Main/StatReport for an overview). Investigator meeting summaries will be recorded on the Stat Lab wiki. Creating wiki pages is the preferred medium. Special documents (e.g., photographs, extensive calculations) may be scanned and posted on the course website. Extensive summary reports must be type-written.

Bibliography

Selected readings made available through the course web site.

Classroom Behavior
Students are expected to be respectful of the instructor, guest lecturers and other students at all times, including limited talking, emailing, texting, etc. Cell phones may be brought to class but must
be on mute or vibrate. If you should need to take an emergency call during class, please leave class quietly.

The Arizona Board of Regents’ Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one’s self. See: http://policy.web.arizona.edu/~policy/threaten.shtml.

Notification of Objectionable Materials (if applicable)
Many university research projects involve animal testing, and are required to follow IACUC guidelines (http://www.iacuc.arizona.edu/). If you choose to not participate in consulting projects involving animal experimentation, it is your responsibility to arrange trading with a classmate.

Special Needs and Accommodations Statement
Students who need special accommodation or services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson, AZ 85721, (520) 621-3268, FAX (520) 621-9423, email: uadrc@email.arizona.edu, http://drc.arizona.edu/. You must register and request that the Center or DRC send me official notification of your accommodations needs as soon as possible. Please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate. The need for accommodations must be documented by the appropriate office.

Student Code of Academic Integrity
Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: http://dos.web.arizona.edu/uapolicies/.

Confidentiality of Student Records
http://www.registrar.arizona.edu/ferpa/default.htm

Subject to Change Statement
Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.