Objectives: The course introduces statistical models for situations where least squares regression and standard ANOVA techniques do not apply. Its objectives are (1) to conceptually understand linear mixed effects models, log-linear and generalized linear models for count data, and survival models for the analysis of lifetime data, (2) to use these models in application to real data, (3) draw valid conclusions and clearly present the results.

Pre- and co-requisites: Pre-requisite STAT525. Co-requisite STAT528.

Required texts:

Recommended texts:

Computing: Open-source statistical software R on personal computers.

Attendance: Attendance is optional, but you are responsible for all the material covered in class.

Handouts: All handouts will be distributed via the course web page.

Mailing list: All announcements, as well as updates/corrections/hints for lecture notes and homeworks will be made via the course mailing list. I encourage you to both ask and answer questions on the mailing list.

Office hours: Tuesdays 10:15-11:15am and Wednesdays 9:30-10:30am. Please come at the beginning of the office hour.
**Homework:** Homeworks are due by the beginning of the class at 9am. These can be paper copies submitted at the beginning of class, or electronic copies submitted by email. Any homeworks turned in afterward will not receive credit. Exceptions may be arranged if discussed in advance. Expect around 11 homeworks during the semester.

**Homework policy:** Please make the homework as easy to grade as possible:

- Each problem must be presented in order.
- Each problem should not exceed 3 pages.
- All graphs and tables must be included in the appropriate position in text (as opposed to adding them at the end), and appropriately labeled. Any graph or figure that is turned in without comments or spans across more than one page will be ignored.
- R output should be included in the appropriate position, and edited with a word processor (e.g., Word or Latex). Please do not include pages of raw R output.

**Exams:** One 2-hour evening midterm exams, and one 2-hour final. One class will be cancelled to compensate for the evening midterm. If you cannot attend an exam at the assigned time, notice must be given at least one week prior to the exam in order to decide on a different (most likely earlier) time.

**Project:** At the end of the semester groups of 3-4 students will perform a project analyzing a real-world problem.

- A month before the end of the semester, each group will submit a project proposal. The proposal will describe group members, the scientific question to be addressed, the available data, and statistical analysis methods that will be used. I encourage you to talk to me before submitting the proposal.
- Each group will write a final report that will be due one week before the end of the class.
- During the last week of the class, each course member will review and comment on the proposal submitted by a different group.

**Breakdown of Grade:** The final grade is based on a total of 400 points broken down into homeworks (100 pts), midterm (100 pts), project (85 pts for the report, 15 pts for the review), final exam (100 pts).

**Re-grades:** all re-grading requests should be made in writing one week after receiving the grade. The request should state the specific question that needs to be re-grades, as well as a short (1-2 sentences) explanation of why re-grading is necessary. The new grade can potentially be lower than the original grade.