



Objectives:

By the end of the course the participant should:

1. understand the concept of a statistical model and how such models correspond to specific hypotheses or questions,
2. be able to interpret the results of an analysis in relation to the original questions or hypotheses that motivated the analysis,
3. be familiar with data analysis methods commonly used in health sciences and understand the basic limitations of competing methods,
4. understand and be able to critique the analysis methods described in published health research papers,
5. be able to communicate effectively with statistical consultants.

Topics:

The scheduling of the following topics is approximate:

1. Review of introductory statistics from the pre-requisite course: Hypothesis testing, estimation and confidence intervals for means and proportions.
2. Review of basic concepts of probability with applications including diagnostic testing, sensitivity and specificity, the relative risk and the odds ratio.
3. Contingency Tables: The Chi-square test, $r \times c$ tables, multiple 2×2 tables, Simpson's paradox, Mantel-Haenszel method.
4. Correlation and simple linear regression: Regression concepts, estimation and testing for regression coefficients, evaluation of the model.
5. Multiple linear regression: Inference for regression coefficients, confounding and interaction, indicator variables, model selection, prediction, model assumptions and checking.
6. Logistic regression: Odds ratios, inference for regression coefficients, model assumptions, case-control studies.
7. Time permitting: Survival analysis including life tables, censoring, Kaplan-Meier method, log-rank test.

Mode of teaching:

Lecture: Asynchronous

Tutorial: NA

Quizzes and Midterm: Synchronous; **Date:** TBA

Final exam: Synchronous; **Date:** TBA

Remote invigilation (Zoom, Proctorio, or other approved software) will be used

Quizzes/HW Assignments	3 %
Midterm Exam (in scheduled class meeting times)	30%
Final Exam (in scheduled class meeting times)	3 %

NOTES:

There will be no make-up midterms.

Above grading is subject to change.

REQUIREMENTS:

Student participation in this course will require computer equipment and a reliable internet connection. You may be requested to turn on audio and/or video during certain instructional activities, that may include tests and examinations, though exceptions will be accommodated. If you request such an exception for personal reasons, you must do so in writing to the course instructor by the end of the first week.

Tech Requirements for online course STAT 305/605:

To be able to complete the online class successfully, at a minimum you will need a personal computer, access to the internet, a webcam, and a microphone to take online exams.

Zoom will be used to proctor the exams.

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