

Biostatistics (EPI 5242)

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Course time: Tuesday, 9:00 am – 12:00 pm (Lecture);
Monday, 9:00 am – 12:00 pm (SAS Lab);

Location: Health Sciences Building, Room 2111 (Lecture)
Health Sciences Building, Room 2111 (SAS Lab)

Office hours: TBA

Prerequisites: Course in statistics within past 2 years, or permission of instructor

Introduction

Welcome to the course! The field of statistics has two branches, mathematical statistics and applied statistics. Applied statistics focuses on applying the methods of mathematical statistics to real data in order to acquire and sharpen scientific knowledge. Biostatistics is a subbranch of applied statistics that focuses on data relating to health and biology. This course aims to give you a solid foundation in the basic methods of biostatistics.

Objectives

The course requirements imply that relatively little of the methodological content will be completely new to anyone. Rather, the goal of this course is to help you put it all together into a big picture so that you can see how the different tools are interrelated. By the end of the class, you should be in a position to effectively bring the whole toolbox to play in research, both in analyzing real epidemiologic data and in thinking about how to design studies so that you end up with data that you *can* analyze to answer your research questions. You should also leave the course with the intuition necessary to critically assess other researchers' analysis.

Course Design

The lectures will proceed in a roughly linear fashion through the recommended textbook, adding material in some places, but will involve no additional reading. An important companion to the lectures is a weekly three-hour SAS lab that will provide instruction on using the SAS statistical computer language. If at all possible, students should arrive at the lab with a laptop computer of their own. These labs are not required and will not be graded. However, they are highly recommended and will be useful in completing the weekly assignments. **Textbook**

The recommended textbook is:

*D'Agostino Sr., RB; Sullivan, LM; and Beiser, AS. Introductory Applied Biostatistics.
Thompson Brooks/Cole, 2006. ISBN: 0-534-42399-X*

Copies of this book have been ordered and should be available in the Health Sciences bookstore at the Ottawa General Hospital. The lectures will follow this textbook closely. A particularly useful feature of this textbook is that each chapter contains an extensive collection of applied examples complete with SAS code and output, many of which are based on a single large dataset from the Framingham Heart Study. The data is provided with the book. Students are strongly advised to read the relevant chapters in the book **before** coming to class.

Evaluation

The evaluation will be based on eleven assignments (total of 40%), a two hour in-class midterm examination (20%), and a three-hour final examination (40%).

Feedback on course

The department of Epidemiology & Community Medicine will be asking you to complete evaluations of the teaching provided towards the end of the course. In addition, the instructor will give you biweekly opportunities to provide ongoing feedback. We would be particularly grateful if you would complete these as this feedback is essential to course development. Thank-you!

In the meantime, we wish you an enjoyable and successful academic year.

Time Schedule and Contents of Sessions

Session	Date	Topic
1	September 15	Introduction and Review <i>Reading: Chapters 1, 2, 3, 4</i>
2	September 22	Hypothesis testing: one-sample inference <i>Reading: Chapter 5</i>
3	September 29	Hypothesis testing: two-sample inference <i>Reading: Chapter 6</i>
4	October 6	Hypothesis testing: categorical data <i>Reading: Chapter 7</i>
5	October 13	Hypothesis testing: inference for proportions <i>Reading: Chapter 8</i>
6	October 20	Mid-term examination
7	October 27	Modeling: linear regression <i>Reading: Chapter 10</i>
8	November 3	Modeling: linear regression <i>Reading: Chapter 10</i>
9	November 10	Modeling: linear regression <i>Reading: Chapter 10</i>
10	November 17	Modeling: linear regression <i>Reading: Chapter 11</i>
11	November 24	Modeling: logistic regression <i>Reading: Chapter 11</i>
12	December 1	Hypothesis testing: nonparametric tests <i>Reading: Chapter 12</i>
13	December 8	Modeling: introduction to survival analysis <i>Reading: Chapter 13</i>