CONTACT INFORMATION

**Professor:** James Bernhard
**Email address:** jbernhard@pugetsound.edu

**Office:** Thompson Hall 390G
**Office hours:** TBA — see course website

My phone number is 879-3812, but the phone is usually one of the slowest ways to reach me. Email is usually much faster.

The course website is the best resource for information about the course. Among other things, it contains a complete calendar for the semester, including all assignments. Also, if you email me a password, you will be able to access your grade-to-date any time during the semester via the course website.

**LEARNING OBJECTIVES** The main goal of this course is **to learn to conduct linear model analyses.** This goal includes several other goals:

- **To become familiar with what linear models are and what they are used for.** In this class, you will learn about many different types of linear models, including: constant linear models, indicator linear models, categorical linear models, simple linear models, polynomial linear models, continuous and categorical linear models, and multiple linear models. You will also learn about statistical techniques related to these models, such as: 1- and 2-sample \( t \)-tests, analysis of variance (ANOVA), simple linear regression, polynomial regression, analysis of covariance (ANCOVA), and multiple linear regression.

- **To learn how to write a computer script as part of a statistical analysis.** Nowadays, any serious statistical analysis involves a computer. In this class, you will move away from a menu-driven computer interface and will learn how to write a computer script, an important part of a statistical analysis.

- **To learn how to use R for statistical computations.** In this class, you will become acquainted with the R statistical computing environment, particularly how to use it in linear model analyses. R is widely used in the statistical community, and the R skills that you learn will translate readily to other statistical packages too.

**PREREQUISITES** To take this course, you should have done at least one of the following:

- **Successfully completed Mathematics 181 (Calculus II) or its equivalent.** If you have a solid background in mathematics or science, as completing Mathematics 181 indicates, then you are prepared for Mathematics 260.

- **Earned a 4 or 5 on the AP Statistics test.** If you are comfortable with the material in AP Statistics, then you have the statistical background to prepare you for Mathematics 260.
• Successfully completed Mathematics 160 (Introduction to Applied Statistics) or its equivalent. If you are comfortable with the material in Mathematics 160, then you have the statistical background to prepare you for Mathematics 260.

• Obtained permission from the instructor. If you have a strong mathematics or science background, or if you are familiar with introductory statistical concepts from a context not listed here, you should seek your instructor’s permission to take Mathematics 260.

Non-prerequisite For this class, you do not need any prior computer experience beyond the usual email and web-browsing. In particular, you do not need any computer programming experience. If you have done some computer programming, that’s fine, but most people who take Mathematics 260 have never programmed a computer before.

Course materials There are two required texts for this course: Statistical Modeling: A Fresh Approach by Daniel Kaplan and An Introduction to Linear Models: R Guide, which I have written for this course. Both texts are available at the campus bookstore. If you would like a pdf version of the R Guide, just let me know and I’ll happy to provide you with one.

Throughout the semester, I will also post on the course calendar additional material that may be useful to you, taken from a book that I am writing.

Most students find it helpful to have a computer for this course, but if you do not have one, you can use library or other campus computers instead.

Coursework The coursework consists of the following:

• Approximately weekly homework assignments, usually due in class on Wednesdays.

• Four larger statistical projects, in each of which you conduct and write up a statistical analysis.

• An in-class presentation of either the third or fourth statistical project during the last week of class.

There are no in-class exams for this course, and there is no final exam. The course is finished on the last day of class.

Grading Your course grade will be based on my assessment of your understanding of the material. By default, I will weight the various components of the course as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Project 1</td>
<td>10%</td>
</tr>
<tr>
<td>Project 2</td>
<td>15%</td>
</tr>
<tr>
<td>Project 3</td>
<td>20%</td>
</tr>
<tr>
<td>Project 4</td>
<td>25%</td>
</tr>
</tbody>
</table>

However, these weights are subject to change due to individual circumstances, so if you believe the above components do not accurately represent your understanding of the material, then you should let me know. If the circumstances dictate, I can work with you to find another way to demonstrate your understanding of the material.

Policy on late work I will not accept late work without an appropriate reason, which you
should explain to me before the work is late if possible. If you are falling behind or need to turn something in late, please see me so that we can discuss it.

**ACADEMIC HONESTY** On the *weekly homework assignments*, you should work with others (other students, myself, tutors, etc.) in any way that helps you understand the material, but the writeup that you turn in should be your own. Similarly, on the *presentation*, you may work with others, especially to practice and obtain feedback on your delivery, but the presentation itself should be your own. On the *projects*, you should not work with anyone besides me.

For practical guidelines on using quotation and paraphrasing effectively and honestly, see the following guide put together by staff at the University of Puget Sound Library:

http://alacarte.pugetsound.edu/subject-guide/6-Academic-Integrity-Puget-Sound

For general information on issues of academic honesty, see the official University of Puget Sound academic honesty policy at:

http://www.pugetsound.edu/student-life/student-resources/student-handbook/academic-handbook/academic-integrity/

**OTHER** Feel free to contact me with any other questions you have about the course. I look forward to an enjoyable class with you this semester!