Course syllabus

Math 260 (Intermediate Applied Statistics)

Handout date: August 27

Course website

http://math.pugetsound.edu/~jbernhard

Contact information

James Bernhard • jbernhard@pugetsound.edu • Thompson Hall 390G

See the course website for my office hours. My office phone number is 253-879-3812, but the phone is usually one of the slowest ways to reach me. Email is usually much faster. (All of my email is forwarded to another account, and you may receive email from me at that account as well.)

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 linear models and some of their applications. In this class, you will learn about many types of statistical inference in the context of linear models, including: 1- and 2-sample t-tests, ANOVA, simple linear regression, ANCOVA, polynomial regression, 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 for linear model analyses. R is widely used in the statistical community, and the R skills that you learn will also translate readily to other statistical packages.

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.

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 is no required printed text for this course. Our text consists of material that I have written online for this course, which I will supplement with handouts posted to the course calendar. 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:
• Approximately weekly homework assignments, usually due in class on Wednesdays.
• Approximately weekly labs, usually on Fridays, ungraded.
• Four larger statistical projects, in each of which you will conduct and write up a statistical analysis.

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.

The homework assignments are to help you learn the statistical concepts in the course, but they do not address when and how to use a computer to carry out statistical computations, which is the primary focus of the labs. While the labs are ungraded, they form a key element in learning how to conduct full statistical analyses. The statistical projects will give you practice combining statistical concepts with the use of a computer to conduct full statistical analyses.

Grading
Your 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>
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<tbody>
<tr>
<td>Homework</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>
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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**

You are allowed to work with anyone—including each other, tutors, and me—on the homework assignments for this class, as long as you do so in a way that helps you learn the material. Projects, however, are in lieu of tests in this class, so you are not allowed to work with anyone on any of the projects, and you should not discuss a project with anyone until the class has completed it and turned it in. If you have any questions on the projects, you are allowed to ask me but no one else.

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/

**University emergency response procedures**

Please review university emergency preparedness and response procedures posted at www.pugetsound.edu/emergency/. There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.

If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.

If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.

**Disabilities**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of Disability Services, 105 Howarth Hall, 253-879-3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

**Other**

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