Stat 5301 (Autumn 2013): Intermediate Data Analysis I

Lecturer
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Office hours in 205B Cockins Hall: Tues 11-noon, Thu 2-3pm, or by appointment.

Grader
To be announced.

Lectures
Tue, Thu, Wed, and Fri, 8-8.55am in Evans Lab (EL) 2004
There will be no classes on 27–30 Aug (These classes will be made up later in the semester).
There will be no class on Wed 27 Nov and Fri 29 Nov (Thanksgiving).
Please download notes from the class website at http://www.stat.osu.edu/~pfc/teaching/5301/

Class Attendance Policy
You are expected to attend all lectures.

Course Description, Learning Goals and Objectives
Stat 5301 is a first course in a two-semester non-calculus sequence in data analysis covering descriptive statistics, design of experiments, probability, statistical inference, one-sample t, goodness of fit, the two sample problem, and one-way ANOVA. This course satisfies the General Education (GE) requirement in Data Analysis.

Expected Learning Outcomes: Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

Students in Statistics 5301 are expected to be able to identify an appropriate analysis for data collected in a study, carry out such an analysis, examine whether the assumptions behind the analysis are reasonable, and recognize the strengths or weaknesses of the study based on how the data were collected. Doing so requires understanding basic concepts in statistics and probability; the ability to create graphical and numerical summaries of data; understanding how the design of a study affects the conclusions that can be made; and the ability to carry out basic statistical analyses (by hand or using statistical software). Students will conduct analyses of data, including a discussion (in plain English) of what conclusions can be drawn.

Prequisites: Not open to students with more than 5 credit hours in Statistics. The sequence is intended for students with “limited” formal mathematics background (a solid grounding in high school algebra is beneficial) although, in terms of data analysis and interpretation, the conceptual level of the course is high. While most of the students in the course are graduate students (it is a required course in many programs), it is certainly an appropriate sequence for junior and senior level undergraduates.
Books
I will not require a textbook for the first half of the course. You may find the book

*Introduction to the Practice of Statistics,*
by D. S. Moore and G. P. McCabe, Freeman (fifth edition onwards),

useful, but it is not required. For the second half of the course the required text is


The Statistical Sleuth is also required for Stat 5302. Please read the Statistical Sleuth as the course progresses, as I may not cover everything in class. The goal of statistics is not calculation, but gaining understanding from numbers. Thus course should be regarded as a research methods course and not a mathematics course! This means that the correct numerical answer will only receive partial credit. The remainder of the credit will be available for choosing the best method of solution and explaining why the method is appropriate. You will also need to *interpret* your answers in the light of the practical problem.

Evaluation

<table>
<thead>
<tr>
<th>Homework</th>
<th>Midterm 1</th>
<th>Midterm 2</th>
<th>Final exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>25%</td>
<td>25%</td>
<td>35%</td>
</tr>
</tbody>
</table>

**Homework** will be due at the *beginning* of class on the day it is due. **No** late homework will be accepted. You are encouraged to work together on the homework, but **do not** copy any part of a homework. Each student must produce his/her own homework to be handed in. Feel free to ask me for help after you have made an attempt of the questions. The grader for the course does not have the time to provide detailed explanations on each question that he/she grades. To make up for this, I will endeavor to make homework solutions detailed enough to allow you to understand how the question could be approached. Homework solutions will be available on the class web site.

**Homework preparation rules:** Put your name and the homework assignment number on the top right-hand corner of every page. All homework must be submitted on 8.5”x11” paper. Staple the pages together. We are not responsible for lost pages. Submit the problems in order, making sure that the computer output and discussion is placed together (do not put the computer output at the end of homework). Raw computer output is not acceptable. Make it clear what parts of the output are relevant and show how they answer the questions posed in the homework.

**Exams:** There will be two *midterms* and one *final exam:*

- Midterm 1 Thu 26 Sep 8:00–8:55
- Midterm 2 Thu 31 Oct 8:00–8:55
- Final Mon 9 Dec 8:00–9:45

All exams are closed book/closed notes. Calculators are allowed – personal digital assistants and cellphones are not. Midterm 1 covers the material up to and including Tue 24 Sep. Midterm 2 covers the material up to and including Tue 29 Oct. The final will cover all the material for the course. There will be **no make-up** exams.
Computing
This class requires you to use the statistical software package called R.
More details will be given in class and on the class web site.

Academic misconduct
It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

Disability Statement
Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.

Disclaimer
This syllabus should be taken as a fairly reliable guide for the course content. However, you cannot claim any rights from it and in particular I reserve the right to change due dates or the methods of assessment. Official announcements will ALWAYS be those made in class.