**Stat 401: Applied Methods in Statistics**  
**Fall 2017**

**Course Hours and Location:**  
Lecture: Tue/Thurs 1:40-2:55pm in Wilson 1-144  
Lab: Thurs 3:10-4:00pm in Reid 305

**Instructor Contact Information**  
Prof. Stacey Hancock  
email: stacey.hancock@montana.edu  
Phone: (406) 994-5350  
Office: Wilson 2-195  
*Office Hours:* Tue/Thur 9-10am, Wed 1-2pm, also available by appointment.  
*MLC Hour (Wilson 1-112):* Wed 3:10-4pm

**Course Webpage:** [http://www.math.montana.edu/shancock/courses/stat401](http://www.math.montana.edu/shancock/courses/stat401)  
Most course information will be posted on the course webpage. However, we will use our D2L course webpage for posting grades, solutions to assignments and exams, and the discussion board. Rather than emailing the instructor, please post questions about the course material on our D2L Discussion board. If you have a question on the material, many other students probably do too!

**Textbook**  

**Course Description and Learning Outcomes**  
STAT 401 provides researchers with a general overview of statistics and is intended for graduate students not majoring in the mathematical sciences. This overview prepares students for higher level STAT courses such as graphical techniques (408), methods of data analysis (411/511), non-parametric methods (431), and sampling (446). We will cover chapters 1-7 in the text. Topics include: the basics of graphical techniques and sampling, transformations, sampling distributions, one-way ANOVA, multiple comparisons, contingency table analysis, and simple linear regression.

After completing this course, students will be able to: describe a data set using appropriate numerical and graphical measures; evaluate the validity of a statistical analysis; determine the scope of inference that can be made in a study; understand and implement the fundamental techniques of statistical inference; and communicate results of a statistical analysis effectively in writing.

**Prerequisite**  
Graduate standing and introductory statistics (Stat 216 or equivalent).

**Computing/Technology**  
- We will be using the open-source statistical software R and the interface RStudio. Download the most recent version of R from [http://www.r-project.org](http://www.r-project.org). Then download RStudio at [https://www.rstudio.com/](https://www.rstudio.com/).
- At times, we may work on an analysis in R together in lecture. Bring your laptop (with R installed) to each class period. If you do not own a laptop, share with another student in class. While not using R, laptops should be put away during class. (See [http://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away](http://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away))
- Any computer output handed in with homework must be concisely summarized with answers clearly identified. No one likes to wade through pages of computer output looking for answers.
- Please silence cell phones and put them away during class. Having your cell phone out is distracting to the instructor, other students, and yourself, and detracts from the classroom learning environment.
Assessment Summary
Grades will be posted in D2L as they become available. We will have weekly (approximately) homework assignments including problems from the textbook, problems using R, and longer data analysis problems and write-ups. The course consists of two in-class midterm exams, one comprehensive in-class final exam, and a semester-long data analysis project.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent of Final Grade</th>
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<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Data Analysis Group Project</td>
<td>20%</td>
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</tbody>
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| Midterm Exam 1
  Tentative date: Thursday, October 19 | 15%                    |
| Midterm Exam 2
  Tentative date: Tuesday, November 14  | 15%                    |
| Comprehensive Final Exam
  Friday, December 15, 2:00-3:50pm     | 20%                    |

In general, late homework will not be accepted. If you have an emergency or extenuating circumstances that keep you from completing the homework on time, speak to Prof. Hancock as soon as possible.

Exam questions will be similar to the homework with a few short answer and multiple choice questions; any required R output will be provided. You may use two *hand-written* 8.5”x11” sheets of notes for each exam. The first midterm exam will cover material up to that date; the second midterm exam will cover material after the first midterm exam up to the date of the second exam. The final exam is comprehensive.

The data analysis project will be comprised of a statistical analysis of a data set of your choice (subject to certain constraints), a written report, and a 10 minute presentation (given during the last week of class). Detailed project instructions and deadlines will be provided at a later date on the course webpage.
Academic Integrity Policies and Guidelines

“Integrity without knowledge is weak and useless, but knowledge without integrity is dangerous and dreadful.” – Samuel Johnson (1709-1784)

Academic misconduct will not be tolerated in any form. Students are responsible for adhering to the MSU academic integrity standards. Read them here:
- [http://www.montana.edu/facultyexcellence/Papers/cheating.html](http://www.montana.edu/facultyexcellence/Papers/cheating.html)
- [http://www.montana.edu/policy/student_conduct/#studentrespon](http://www.montana.edu/policy/student_conduct/#studentrespon)

I encourage students to form study groups and collaborate on work, *after attempting the work individually*, however, the work that is handed in should reflect only that student’s work. That is, discussing the METHODS of a solution with other students is allowed, but copying another student’s answer or copying from prior course solutions is NOT.

Consequences of academic misconduct:
In Prof. Hancock’s courses, any instance of academic misconduct, whether it is on homework, quizzes, exams, or other parts of the course, will be reported and may go on your student record, *without exception*. Copied homework or lab assignments will result in zero credit for the assignment for all parties involved. Academic misconduct on an exam or final project will result in zero credit for the entire exam/project. Egregious instances of academic dishonesty may be subject further penalties.

Guidelines to avoid plagiarism and cheating:
- **Do not look at another person's homework.** Instead you should prefer to discuss the problem orally or on a white board. This helps you to communicate clearly, practice technical jargon as it applies to your problem, and to identify how your solution exhibits behavior different from what you expect.
- **Do not write down the solution in your notes.** Working in a group is a rewarding experience, and definitely a necessary skill in any professional career. Collaboration between students can include drawing diagrams and perhaps solving the problem on a whiteboard. However, you should avoid writing the solution in your notes. It is very useful to rethink the problem and go through the details and logic when you solve it again on your own.
- **Do not look at another student's paper during an exam.** This one is obvious. Avoid the urge for wandering eyes and stick to your integrity.
- **Focus your efforts on learning.** Many instances of academic misconduct involve students that are too focused on their grade, rather than on building knowledge and ideas. Additionally, time spent trying to figure out how to cheat on an exam is better used studying for the exam. Grades come and go, but knowing that you learned something, and using that knowledge to better yourself will remain with you.

It is expected that:
- **You will monitor each other and enforce these rules among yourselves.** Making sure that others follow these guidelines will help to ensure that they don’t pass off your work as their own.
- **Your work honestly represents your efforts.** The entire purpose of obtaining an education is so that you can accumulate a body of skills and experience that are inherently valuable and will help you in your career and life. If you do not perform the work yourself, then you have cheated yourself out of your education. Employers in our field can (and do) screen applicants for skills and knowledge. You will perform poorly (and discredit MSU) if you do not practice now by doing your own work.

Above all, a college education is a huge individual accomplishment, and you should be proud of this accomplishment, knowing that you approached this time in your life with honesty and integrity.