Instructor: Dr. Min Zhang

Office: MATH 516
Office Hours: T 12:15pm-1:30pm

Appointment: If you cannot come to scheduled office hours, you may arrange an appointment for another time. Please be courteous and make an appointment instead of just “dropping by”. You can arrange an appointment either by phone or by email.

Phone: 765-(49)6-7921
Email: minzhang@stat.purdue.edu

Course Objectives: To conceptually understand the application of simple linear regression, multiple regression, analysis of variance (ANOVA), logistic regression and loglinear model methods. To properly apply these methods to real world problems using SAS statistical software and draw valid conclusions. To present these conclusions in a concise and clear manner.

Textbook: Applied Linear Statistical Models, 5th edition, by Kutner, Neter, Nachtsheim & Li. (Required). The text is large (and heavy, sorry!) and quite wordy, but it does provide lots of examples and graphs which are helpful.

Web Page: http://www.stat.purdue.edu/~minzhang/525-Spring2016/STAT525-frontPage.htm This page will be used to provide you with information relevant to the course. Such information includes this page, announcements, lecture notes, homework assignments and solutions, reading assignments, data sets, dates of exams, review sheets, and changes to office hours. Please check this page regularly for updates.

Mailing List: A mailing list has been arranged for this course. I will send email to this list with any special announcements or reminders if it is necessary.

Class Time: I will try to begin and end every class promptly. It is usually not a good time to ask lengthy questions or make appointments right BEFORE classes, since I will be busy setting up the computer, arranging handouts, etc before class. Please email, call, or come to office hours instead. Questions during class are welcomed and encouraged.

Lectures: Lecture notes will usually be displayed on the computer projection screen during class, occasionally supplemented by blackboard sketches and/or overhead transparencies. The computer-displayed notes will be made available to you on the class web page. Usually they will be available in advance of class. We will cover roughly one/two chapters per week, so lectures will go pretty quickly. You are always welcome to ask questions if I need to slow down.

Attendance: Attendance is required. If you cannot attend an exam at the assigned time, notice must be given at least a week prior to the exam in order to decide on a different (preferably earlier) time.

Final Grade: Your final grade will depend on the following components with these proportions: homework (20%), midterm exam 1 (30%), midterm exam 2 (30%), and final project (20%). The percentage grades needed to achieve an A, B, C, or D will follow approximately the following scale: 99+ = A+, [90,99) = A, [80,90) = B, [70,80) = C, [55,70) = D, [0,55) = F. The minimum score needed for a given letter grade could be lowered if necessary but will not be raised.
SAS Computer Software: We will use SAS 9.3 to perform data analysis in this class. The intent of using software is to allow the computer to perform routine calculations and graphing, while we focus on choosing the appropriate analysis tools and interpreting the results. Computer software is NOT a substitute for understanding the statistical methods, and you will not have access to a computer during exams. SAS is available in the Purdue computing labs. You may also obtain a copy of SAS for your own PC for class purposes free of charge by showing your student ID at ITaP Software Distribution Desk (Stewart Center, Rom G31). Learning SAS will be one of the biggest challenges in this course, and you should be prepared to devote some time to this, especially in the first few weeks. The only way to learn how to use SAS is to try it! There are several sources of SAS help available. Make use of the SAS help system within the program to look up specific details. Another tool that should not be overlooked is the Web for finding SAS help. If you need help in person, the Statistics Department provides a software consultant in MATH G-175 through Statistical Consulting Service, M-F, 10am-4pm; also they provide a document with a nice introduction to SAS (http://www.stat.purdue.edu/scs/help/SASshortcourse.pdf). You can also get help from the instructor in office hours or by email. SAS OnlineDoc is available at http://support.sas.com/91doc/docMainpage.jsp.

Reading: I expect you to read the text as we cover the material, which is about two chapters every week. It can help to read about a topic before it is covered in class. This does not mean that I expect you to learn it all on your own. Rather, your reading before the class should be a “first pass” at the subject. The first time through, I just want you to read through it quickly, in order to get a general idea of the material - the ”big picture”. Don’t get bogged down in formulas or details; just try to get a rough idea of the material and get familiar with the vocabulary. This will prepare you for what is to come in the class, and will make the class easier to follow. If, as you are reading, you find something hard to understand, don’t be alarmed or discouraged. Just make a note of any parts you found confusing, or any questions that occur to you as you read. Often, you will find that those questions are cleared up in the following class. If not, please ask during class! Later, as you are working on problem sets and studying for tests, you will find it helpful to read the material again. This time, read at a much more detailed level. It will be a lot easier to follow then, since you have already covered the material in class. Repetition and practice are important learning tools.

Homework: Homework will be due Thursdays at the beginning of class. Shortly after class an answer key will be made available on the Web page and any homework turned in afterward will not receive credit. It is better to turn in what you have completed instead of nothing at all. Exceptions may be arranged if discussed in advance. Expect around 12 homeworks during the semester. They will be handed out at least a week in advance so students can work around potential conflicts. When turning in your homework, each problem must be presented in order. This includes all relevant graphs and tables, which must be easily readable and appropriately labeled. You are limited to a maximum of 3 pages per problem (you can request an exception). Any graph or figure that is turned in without comments or spans across more than one page will be ignored. You should use a word processor or editor (e.g., Word) to edit SAS output.

Project: At the end of the semester there will be a project where groups of 1-2 students find a real-world problem to analyze and summarize. A month before the end of the semester, each group will submit a project proposal. The proposal will describe group members, the scientific question to be addressed, the available data, and statistical analysis methods that will be used. I encourage you to talk to me before submitting the proposal. Each group will write a final report that will be due a week before the end of the class. During the last week of class each class member will receive a report from another group, and evaluate the analysis and conclusions of the project.
Re-grades: Since the professor and grader are fallible human beings, occasionally errors will occur in grading. For this reason, students are able to request that such an error be corrected. Two types of error can occur. A type I error occurs if points are deducted for a correct solution. A type II error occurs if sufficient points are not deducted for an incorrect solution. Any request for a re-grade must be made in writing with a detailed explanation of the suspected error (“Please look at problem 4” is not considered a detailed explanation), or it will be ignored. Please note that a re-grade request is different from the questions “Can you help me figure out what I did wrong here?”, or “I don’t understand the posted solutions”, which are entirely appropriate for office hours.

Academic Integrity Statement: Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor. In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. “Proper attribution” means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis.

As a general rule, if you are citing from a published source or from a web site and the quotation is short (up to a sentence or two) place it in quotation marks; if you employ a longer passage from a publication or web site, please indent it and use single spacing. In both cases, be sure to cite the original source in a footnote or in parentheses. If you are not clear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor beforehand.

Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. So be proud of your academic accomplishments and help to protect and promote academic integrity at Purdue. The consequences of cheating and academic dishonesty - including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school - are simply not worth it.

My Expectations: I expect that you will work hard in this course. I expect you to come to each class prepared to listen and understand. I expect that you will ask questions if things are not clear. I expect that you will use the textbook and other resources, and will read material as assigned. I expect you to attend class regularly, and that you will promptly catch up on any classes you miss. I expect you to make an honest attempt at assigned homework, and to ask for help when you need it. I expect you to behave appropriately and politely towards me and your fellow classmates at all times. This includes remaining quiet when others are speaking and being patient with the questions of others. I expect you not to misrepresent the work of others as your own, and to neither give nor receive unauthorized aid in examinations or homework.

Your Expectations: You can expect that I will work hard in this course. I will do my best to explain and illustrate the material in a way that makes sense to you. Sometimes I will need help and feedback from you in order to figure out the best way to explain something. I will listen to your questions with respect and never ridicule (although teasing is not out of the question); if the answer to your question is beyond the scope of this course, I would be happy to discuss it with you outside of class. I will give you fair notice of all assignments and tests and do my best to let you know what is required of you. I will attempt to evaluate your work fairly and assign grades appropriate to your performance. If you have other expectations, hopes, or suggestions, please let me know. I will do my best to make
this course a success for all of us.

**In the Event of a Major Campus Emergency:** Course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Here are ways to get information about changes in this course: course web page, my email address and office phone.

**Tentative Course Schedule:**

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topics</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Simple Linear Regression</td>
<td>1-5</td>
</tr>
<tr>
<td>4-5</td>
<td>Multiple Regression</td>
<td>6-8</td>
</tr>
<tr>
<td>6-7</td>
<td>Model Building and Selection</td>
<td>9-11</td>
</tr>
<tr>
<td>8-9</td>
<td>Single Factor ANOVA</td>
<td>16-18</td>
</tr>
<tr>
<td>10-11</td>
<td>Two-Factor ANOVA</td>
<td>19-20, 23</td>
</tr>
<tr>
<td>12</td>
<td>Multifactor ANOVA &amp; ANCOVA</td>
<td>24,22</td>
</tr>
<tr>
<td>13</td>
<td>Mixed Effects Models</td>
<td>25</td>
</tr>
<tr>
<td>14</td>
<td>Logistic and Poisson Regressions</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Group Presentations &amp; Review</td>
<td></td>
</tr>
</tbody>
</table>

**Other Helpful Texts (Reserved at Math Library):**