STAT 511: Statistical Methods
Summer 2014
Division: 2 MTWRF 11:00 am – 12:00 pm, REC 302
3 MTWRF 1:00 pm – 2:00 pm, REC 309

Instructor: Dr. Leonore Findsen
Office: MATH 535 (mailbox: MATH 533)
Note: I might be moving my office in the middle of the semester. Please pay attention to any notices concerning this.
Phone: (765) 49-46030 (Departmental office, messages only)
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Office Hours: MTWR 2:00 pm – 3:00 pm
Textbook: Devore, Probability and Statistics for Engineering and the Sciences (Custom edition with Enhanced WebAssign Access Card), 8th ed. This is a 3-ring bound version of the book. Since we will be using WebAssign and this includes the e-book, you can just buy the Access Card from the publisher's web site (Cengage) without having to buy a hard copy of the book. See the class web page for more details. If you want to buy the book used, you will still need to buy the Access Card.
We will cover chapters 1 – 12 (except Ch. 11). See the outline at the end of the syllabus for details.
A copy of the book is on reserve in the Math Library for your use. Homework assignments will mostly be on WebAssign, however, some of the questions might be only on paper. Note: The international edition has different problem numbers.
Web page: http://www.stat.purdue.edu/~lfindsen/stat511/stat511_s14.html
This page will be used to provide you with information relevant to the course, e.g. announcements, power point slides, homework assignments and solutions, data sets, dates of exams, review sheets, and changes to office hours and the location of my office. Please check this page regularly for updates. All announcements will be posted on the web page whether they are stated in class or not.

- **Course Description**: Applied statistics for students with a calculus background. Some probability theory is presented but applicable statistics is emphasized. May lead to STAT 512 or STAT 513. Taken by both undergraduate and graduate students from many subject areas, especially engineering and physical sciences.

- **Course Goals:**
  1) Choose and identify appropriate experimental and sampling designs
  2) Use of probability distributions to analyze data.
  3) Use statistical methods to analyze data
  4) Draw conclusions from these statistical analyses
  5) Write statistical reports using correct terminology, analyses, and graphs

- **Discussion Groups:** We will be using Piazza this semester for online discussions and questions. Besides other features, this allows both sections to interact in the same discussion group. To enroll, please go to https://piazza.com/purdue/summer2014/stat511. You may post anonymously if you want; however, I will be giving bonus points for people who do post using their name. The bonus is 1 point for every 14 appropriate posts. In addition, you can find classmates in either section to form study groups.

- **Blackboard**: Grades will be posted on Blackboard. This semester, I am trying to sync the scores from WebAssign directly to Blackboard. If this doesn't work, we will manually copy the scores over. Note that the raw score in WebAssign will NOT match the final score on each assignment because some problems won't be listed there and you will be graded on your work. Depending on how the sync works, either the total score for each assignment will be on your paper or just the grade of the work and web questions will be listed. The total number of points might or might not be correct on Blackboard, please see the key for the correct value. (Please see Homework below for more details). If there are any discrepancies in the grade on Blackboard and what you received on your paper, please contact me so that it can be changed. There will be no changes made to the grades on Blackboard after Friday, August 1 (except for the final exam and material returned after Thursday of that week).

- **Lectures**: PowerPoint slides will be used that contain some of the examples and figures used in lecture and will be provided in the Class Notes link on the class web site. No other class notes are supplied. I would strongly recommend that you print out the power point slides before each class lecture. Slides with a red x in the lower right hand corner have not been updated yet.

- **Final Grade**: Homework (15%), Projects (15%), Midterm 1 (20%), Midterm 2 (20%), Final (30%). The final percentages needed for a particular grade are as follows: 90 – 100 = A, 80 – 89 = B, 70 – 79 = C, 55 – 69 = D, < 54 = F. The minimum score needed for a given letter grade could be lowered if necessary but will not be raised. +/- grades are only given in special circumstances. (I expect – but won't guarantee – that the median grade in this class will be a high B.)

- **Computer Software:** Even though this course does not require the use of statistical software for most of the homework, I will be using output from software packages in the lecture notes. The projects will also require the use of statistical software packages. This semester, I will only be providing help for JMP on the Computer Software page; however, you may use any package that you want for any graphing required in the homework (or do the graphs by hand) and the projects. Other packages available on campus are R, Minitab, SPSS and SAS. ITaP Computers have all of the above software packages. You can also access them via GoRemote.

- **Reading**: I expect you to read the text as we cover the material. It can be helpful 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, working on the projects 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.

- **Exams**: There will be two midterm exams and the final examination. The two midterms will be night exams for all students. Midterm 1 is scheduled to be **Wednesday, July 2 at 6:30 pm in BRNG 2280** and Midterm 2 is scheduled to be on **Wednesday July 23 at 6:30 pm in WTHR 320**. The time/date/location of the final will be available later in the semester (finals 'week' in summer is Aug. 6 – Aug. 8). The Final Exam covers all of the material included in the class with more emphasis on the material covered after the second Midterm. Each examination will contain both mathematical and conceptual components. The problems contain multiple choice (mostly conceptual) and short answer (mostly mathematical) questions. Each Midterm will be worth **20%** of your total grade and the final is worth **30%** of your total grade. You may use any calculator that you want on the exams. The extra capabilities of a graphing calculation won't help you since you have to show all of your work to receive credit.

  For each Midterm, you may have a cheat sheet of one side of an 8 ½" X 11" sheet of paper which may be hand written, typed/copied or a combination of these methods. On the final, your cheat sheet can be up to two sides of an 8 ½" X 11" sheet of paper. The tables that will be provided will be mentioned in class and the objectives. No other reference materials will be provided.

  Once the exam is started, if you leave, you may not return. If there are any problems with this rule, please let me know BEFORE the exam starts.

  Contact me as soon as possible if you are unable to take an exam at the scheduled time so a makeup can be scheduled. After the exam key has been posted on the web site, NO MAKEUPS will be allowed.

- **Homework**: Homework will be due on one or both of Tuesday and Friday at 2:30 pm depending on the week. Most of the problems will be on WebAssign, but not all of them. However, the work for **ALL** problems (that involve work) is required to be turned in. Problems that are not on WebAssign should be listed first, then the work for the WebAssign problems. The work on selected problems will be graded; therefore, the score on WebAssign will not be correct even if there are no additional problems assigned. **The score of work and problems not posted on WebAssign will be reported on your paper and on Blackboard and the synced homework will also be posted on Blackboard (hopefully).** If the syncing does not work, then the total points will be recorded on your paper. Please see the class web site for the dates and the non-WebAssign problem assignments as these will NOT be provided in class. After each lecture, I will add to the assignment. When the assignment is complete, I will place a blue **|** on the web page. The homework will normally be assigned at least 2 – 3 days in advance although I recommend that you start working on each day's assignment right after class. You are encouraged to discuss the assignments with other students but you must write up your homework independently; identical solutions are NOT acceptable. If identical solutions are found, all the parties involved will receive a 0 on that assignment The key for each homework assignment will be posted on the web site shortly after it is due (with the total number of points). LATE HOMEWORK (after 2:30) WILL NOT BE ACCEPTED UNDER ANY CIRCUMSTANCES; HOWEVER, THE LOWEST HOMEWORK GRADE WILL BE DROPPED. Your total homework grade will constitute **15%** of your total grade in this class.

  Homework must be stapled if it is longer than one page. The first page must include your name, my name (Dr. Findsen), the number of the problem set (e.g., HW #2), the due date, the course: STAT 511 and the section, (section 2 or 11 am) or (section 3 or 1 pm).

- **Projects**: There are two projects for this course which are more involved than the homework problem sets. Please do not wait until the last minute to start on them. Both require the use of computer software (see above). Project 1 will be due on **FRIDAY**, **July 11** and Project 2 will be due on **TUESDAY**, **July 29**. The instructions will be placed on the homework and project web page. A late penalty of at least 50% will be applied for all late assignments. Your project grade (a combination of the two projects) will constitute **15%** of your total grade in this class.

- **Re-grades**: Since all humans make mistakes (including the professor and the grader), errors will occur in the grading. The following procedure is required if you want your assignment re-graded:

  If you have a problem with WebAssign (or any other problem) before the due date, please send me an e-mail as soon as possible so that it can be corrected for you and your classmates. If you think that a WebAssign assignment is graded incorrectly after you see the key, please submit a re-grade as indicated below. After I post the WebAssign assignments, I assume that they are graded correctly unless told otherwise.

  1) Attach a new piece of paper to the *front* of the work to be re-graded which contains the following information:
     a) The word "Re-grade" displayed prominently.
     b) Your name
     c) Stat 511 and section. Be sure that this is clear so we know which course and section to look at.
     d) Which homework, project, or midterm is involved (e.g., HW 1)
     e) The relevant problem number(s) (e.g. problem 2.6) or "Addition error" or "WebAssign incorrect."
     f) A detailed explanation of the suspected error ("Please look at problem 4" is **NOT** considered a detailed explanation) or provide the total number of points which you calculated if the assignment was added incorrectly.
     g) date of resubmission
  2) Print out the solutions from the web page (at least the relevant portions) and circle the relevant piece of the solution. Attach this *behind* the work to be re-graded. (This is not required if you think that the points were added incorrectly.)
  3) Give this packet to me, or put it in my mailbox (in MATH 533). A verbal explanation is neither necessary nor appropriate.

  No exceptions will be made to this policy. On the front piece of paper, you will receive a written explanation explaining the outcome. I will review the grader's response before returning it to you to make sure the problem was resolved. Re-grade requests *must be submitted within 1 week of when the assignment is turned back in class unless explicitly stated otherwise by the professor.* Any rudeness accompanying a re-grade request will result in the assessment of a "technical foul" penalty equal to the total number of points for the disputed question. Note this is only for re-grading, if you are confused about the answer to a problem, please come to office hours (or send an e-mail or post to Piazza.com) and ask.

- **General comments**: **Although this is not a math course, there is a fair amount of Calculus discussed in this course; especially integration.** I expect you to know how to integrate basic functions. As in many other science courses, we will make use of mathematics quite extensively, and most questions will have some quantitative component.

  A decent calculator that has some statistical functions and is easy to use will be a definite asset. If you don't have the manual for the calculator, check online to see if one is available. Though knowing when and when not to use a certain statistical method and why, and how to interpret the results, are at least as important as knowing how to actually carry out the calculations.

- **General Course Policies:**
  1) If you have questions concerning the class; please come to my office hours, make an appointment or send me an e-mail or post on Piazza. I normally look at my e-mail numerous times during the day and evening hours and try to respond within 24 hours.
  2) At the beginning of class, I normally make announcements, comments and provide advice. If you do need to arrive late or leave early, please sit in a location that does not disrupt the class.
  3) The use of cell phones is prohibited in class and during the exams.
  4) I strongly encourage all students to read the relevant material in class before attending the lecture so you are familiar with what will be covered. I also strongly recommend that you print out the relevant PowerPoint slides and bring them to class to take notes on.

- **Academic Dishonesty:** We take academic integrity very seriously in this course. The only true way to get an education is through hard work and striving to understand the concepts on your own. Penalties for academic misconduct range from a 0 on the assignment to failure in the course with referral to the Dean of Students for further sanctions. *Note that we punish not only the person who cheats but also the person who enables the cheater.* For information on Purdue's guide please see http://www.purdue.edu/odos/aboutodos/academicintegrity.php.

- **Attendance:** Students are expected to be present for every meeting of the classes in which they are enrolled. Though I do not take roll in class, students are responsible for all material covered in the lectures. Not all of the material discussed in class is available in the textbook. If a student misses a class it is up to that student to check with their classmates to obtain the missed material; I do not provide lecture notes to the students. For information on Purdue's attendance policy, please see http://www.purdue.edu/odos/services/classabsence.php.

- **Students with Disabilities:** Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access and participate in the programs, services, and activities at Purdue University.

  It is the student's responsibility to notify the Disability Resource Center (http://www.purdue.edu/drc) of an impairment/condition that may require accommodations and/or classroom modifications. The student may use the back of the questionnaire to inform the instructor at the beginning of the semester of any accommodations that are required; however, official paperwork is required at least two weeks in advance of any exams or assignments that require accommodations (except for the first homework assignment). Please make an appointment to speak with me within the first week of the semester in order to discuss any adjustments that you require.

- **Grief Absence Policy for Students:** Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for missed assignments or assessments in the event of the death of a member of the student's family.

- **Violent Behavior Policy:** Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity.

- **Health and other emergencies:** If a student has a serious medical issue, the instructor needs to be contacted via e-mail as soon as possible so accommodations can be made. If e-mail is not possible, leave a message at the number provided in the syllabus. The student will also need to provide documentation of the issue. Only limited accommodations can be made if the instructor is first contacted AFTER the student turns in the assignment or takes the exam.

  In the event of a major campus emergency or other circumstances beyond the instructor's control, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar. Relevant changes to this course will be posted onto the course website, http://www.stat.purdue.edu/~lfindsen/stat511/stat511_s14.html, or can be obtained by emailing the instructor at LFindsen@purdue.edu. You are expected to read your @purdue.edu email on a frequent basis.

- **Nondiscrimination:** Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

  Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit www.purdue.edu/report-hate to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.

- **Approximate Outline** (including the readings for each section

Topic	**Reading**
Descriptive Statistics	1
Basic Probability	2
Discrete Random Variables	3
Continuous Random Variables	4 (except 4.5)
Joint Probability Distributions	5.1 – 5.2
Sampling Distributions and the Central Limit Theorem	5.3 – 5.5
Point Estimation	6 (except 6.2)
Confidence Intervals	7 (except 7.4)
Hypothesis Testing	8
Statistics using two samples	9 (except 9.5)
ANOVA	10 (Ch. 11 is skipped)
Linear Regression	12 (except 12.4)

This syllabus is subject to change.