MTH 545/645: Applied Statistics

Spring 2018

Instructor: Songfeng (Andy) Zheng

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Room and Time: Cheek 210 (Tue) and Cheek 172 (Thur.), 11:00am – 12:15pm.

Office and Hours: Cheek 22M, 9:30am – 10:30am, Monday to Friday; or by appointment. Office hours are offered for individual help and getting to know how you understand the material, so please use them.

Textbook: *Introductory Applied Biostatistics* by Ralph B. D'Agostino, Sr., Lisa M. Sullivan and Alexa S. Beiser. This is a good textbook, providing a lot of examples from biology and medical science. I strongly suggest you read the textbook regularly, and will list some suggested reading chapters/sections.

Course webpage:

[http://people.missouristate.edu/songfengzheng/Teaching/MTH545_S18.htm](http://people.missouristate.edu/songfengzheng/Teaching/MTH545_S18.htm) will provide homework assignments and solutions, announcements, software manual, the topics covered each lecture, the suggested reading materials, and other learning materials.

Objectives & Prerequisites: Statistical theory and methodology are needed in almost all disciplines. The course MTH 545/645 is a beginning course in probability and statistics emphasizing applications in biological or medical sciences. This course deals with various statistical tools and ideas to collect, analyze, and draw inference from data arising from both observational and experimental studies in science and engineering. The students will receive training in descriptive statistics, probability, and statistics inference. Topics include statistical models, random sampling, normal distribution, estimation, confidence intervals, tests and inferences in single and two populations, and simple linear regression. Roughly, chapters 1 to 7, part of chapter 8, and part of chapter 10, from the book.

The prerequisite for this course is MTH 130, or MTH 288, or MTH 301, or equivalent. We will use the software package Excel and R to perform certain calculations.

Outcomes: Understand and create graphical summaries of data, and compute various descriptive measures of data. Work with introductory probability, discrete and continuous probability distributions. Work with sampling distributions, and the Central Limit Theorem. Construct confidence intervals for population means,
proportions, and difference between mean values. Conduct tests of hypotheses for population means, proportions and difference between mean values.

**Grading Policy and Studying Suggestions:**

Homework: 15%  
Five in-class Quizzes: 25%  
Two In-class Tests: 30%  
Final Exam: 30%

Grading policy: A (>90%),  B (80 --- 89%),  C (70 --- 80%),  D (60 – 70%),  F(<60%)

Final exam date: 11:00am --- 1:00pm, May 15th, Tuesday.

It is important that you read the text book and lecture notes regularly (I will list the suggested reading materials online for each week), understand the problems worked out in the text and practice by doing the problems. Doing the homework problems is absolutely essential to get a better grade in this course. You are allowed to discuss the homework problems among yourselves or with me. However the final work handed in must be completely your own. Anyone who receives or gives an unauthorized aid on a homework or test is considered to be cheating. **Late Homework will not be accepted!**

There will be five short and easy quizzes, and two midterm exams. The quizzes will be given in class without announcement --- you are supposed to attend the lectures. The final exam will be comprehensive! No make-up test or exam will be given under ordinary conditions. The only acceptable excuse for missing a test is an extreme emergency. However, you must obtain a written explanation from a physician, etc. The exam date will be announced in class (and on the course webpage) about half week ahead. **If you cannot take the test on the scheduled day, you must contact me at least one day before the test date.**

**Emailing format:** Email is an important means to communication in everyday life as well as in this course. Due to the large amount of emails sent to me every day, and due to different courses I am teaching, I suggest you clearly write a subject in the email, and in the subject, clearly tell which course you are from. For example, a good email subject would be like

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Subject: MTH 545: Q about #7 in HW2
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Thus, I can quickly locate your problem and will reply quickly. **Emails which don’t have a clear subject may be simple ignored!**

**Miscellaneous Notes:**

**Attendance policy:** The University expects instructors to be reasonable in accommodating students whose absence from class resulted from: (1) participation in
University-sanctioned activities and programs; (2) personal illness; or (3) family and/or other compelling circumstances. Instructors have the right to request documentation verifying the basis of any absences resulting from the above factors. Please see The University’s attendance policy can be found in the 2010-2011 Undergraduate Catalog at www.missouristate.edu/registrar/attendan.html.

**Academic integrity:** Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university’s Student Academic Integrity Policies and Procedures, available at www.missouristate.edu/policy/academicintegritystudents.htm. You are also responsible for understanding and following any additional academic integrity policies specific to this class (as outlined by the instructor). Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy. If you are accused of violating this policy and are in the appeals process, you should continue participating in the class.

**Nondiscrimination:** Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Equity and Diversity, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor’s Department Head. Please visit the OED website at www.missouristate.edu/equity/.

**Disability Accommodation:** To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), www.missouristate.edu/disability. Students are required to provide documentation of disability to the Disability Resource Center prior to receiving accommodations. The Disability Resource Center refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787, http://psychology.missouristate.edu/ldc.

**Cell phone policy:** As a member of the learning community, each student has a responsibility to other students who are members of the community. When cell phones or pagers ring and students respond in class or leave class to respond, it disrupts the class. Therefore, the Office of the Provost prohibits the use by students of cell phones, pagers, PDAs, or similar communication devices during scheduled classes. All such devices must be turned off or put in a silent (vibrate) mode and ordinarily should not be taken out during class. Given the fact that these same
communication devices are an integral part of the University’s emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away. Other exceptions to this policy may be granted at the discretion of the instructor.

**Emergency Response policy:** Students who require assistance during an emergency evacuation must discuss their needs with their professors and Disability Services. If you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. For additional information students should contact the Disability Resource Center, 836-4192 (PSU 405), or Larry Combs, Interim Assistant Director of Public Safety and Transportation at 836-6576. For further information on Missouri State University’s Emergency Response Plan, please refer to the following web site: http://www.missouristate.edu/safetran/erp.htm

**Dropping a Class:** It is your responsibility to understand the University’s procedure for dropping a class. If you stop attending this class but do not follow proper procedure for dropping the class, you will receive a failing grade and will also be financially obligated to pay for the class. For information about dropping a class or withdrawing from the university, contact the Office of the Registrar at 836-5520.