Instructor: Songfeng (Andy) Zheng

Email: SongfengZheng@MissouriState.edu Phone: 417-836-3037

Room and Time: Cheek 174, 2:00 pm – 3:15 pm, Tue and Thur

Office and Hours: Cheek 22M, 10:00am – 11:00am, 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.


Mathematical Statistics and Data Analysis, 3-rd Edition, by John A. Rice. (Optional)

Course webpage:

http://people.missouristate.edu/songfengzheng/Teaching/MTH741_F14.htm will provide the download of various course materials, including the lecture notes, homework assignments, announcements, and data for exercises.

Objectives & Prerequisites: The course MTH 741 will lay out the theoretical foundation of statistics. After taking this course, students are expected to:

1. Understand common statistical models and applications of probability; commonly used sampling distributions and density functions.

2. Determine moments and use moment generating functions.

3. Utilize exponential families, marginal and conditional distributions, transformation and change of variables.

4. Understand convergence concepts and large sample theory

This course is required for all graduate students in statistics. Prerequisite: Advanced calculus.

Materials to be covered (tentative): The contents include fundamental of probability, conditional probability and independence, distribution, density, and mass functions, random variable, moments and moment generating functions, discreet and continuous random variables, exponential families, joint, marginal, and conditional distributions, transformation and change of variables, convergence concepts, sampling distributions, order statistics, random number generation.
Grading Policy and Studying Suggestions:

Homework: 25%  In-class 2 Tests: 30%  Final Exam: 45%

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

Final Exam date: 1:15 --- 3:15, Dec. 9, Tuesday.

It is important that you read the text book(s) and lecture notes regularly, 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.

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. If you cannot take the test on the scheduled day, you must contact me 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

Subject: MTH 741: Q about #7 in HW2

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.
Tentative Lecture Schedule in Fall 2014 (MTH 741)

Week 1: Set theory, basic of probability theory
Week 2: Conditional probability and independence, random variables
Week 3: Distribution functions, density and mass functions
Week 4: Distributions of functions of a random variable, expected values
Week 5: Moments and moment generating functions
Week 6: Discrete distributions
Week 7: Continuous distributions
Week 8: Exponential families, location and scale families
Week 9: Joint and marginal distributions, conditional distributions and independence
Week 10: Bivariate transformation
Week 11: Hierarchical models and mixture distributions, covariance and correlation
Week 12: Multivariate distributions and inequalities
Week 13: Basics of random samples, sums of random variables from a random sample
Week 14: Sampling from the normal distribution
Week 15: Order statistics, convergence concepts