A&M-COMMERCE

MATH 501–01W: Mathematical Statistics I
Summer 2024 Syllabus

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Preferred form of communication: Email
Communication Response Time: Usually within 24 hours during weekdays, M-F.

Course Information

MATH 501–01W: Mathematical Statistics I
    CRN # 41820, credits: 3
    Meets 6/3/2024 through 7/3/2024

> This course will be conducted online on D2L Brightspace. Please visit the class website at `https://myleoonline.tamuc.edu/d2l/home`.
>
> Content-based video lectures along with the lecture notes will be posted on D2L. You are responsible to watch these videos and study these notes.

Course material

- Textbook:

  - Wackerly, D. D., Mendenhall, W., & Scheaffer, R. L. (2008). Mathematical statistics with applications (7th Ed.). Belmont, CA: Thomson Brooks/Cole., ISBN-10: 0-495-38508-5.
  - Casella, G., & Berger, R. (2001). Statistical inference (2nd Ed.). CRC Press.

  We mainly use Wackerly *et al.* (7th ed.) book. Selected topicc from Casella and Berger (2nd ed.) will be covered in this course. Please follow posted videos and lecture notes for details instruction.

- Statistical software **R**.

  - It is freely available at `https://www.r-project.org`. We may use **RStudio**, which is an interface for **R**. You can download it for free at `https://www.rstudio.com/products/rstudio/download/`. To use Rstudio you must download and install both **R** and Rstudio.

In this course, we will be using the statistical software **R**. Some of the exams, quizzes, and HW assignments may involve the statistical software **R**. The exams may involve also the interpretation of output from the **R**.

Prerequisite

MATH 2415 (Calculus III) with a minimum grade of C. Students should review topics from prior courses as needed using old notes and books.

Course description

A graduate level course in Probability Theory intended to provide the theoretical background for a course in statistical inference. Topics covered include: probability, random variables, distributions, moments, convergence of random variables, probability inequalities, random samples.

Learning Outcome

In this course, you will learn the following topics (Chapter 1–7 of Mathematical Statistics with Application (7th Ed.)):

- A brief review of introduction to **R** for data analysis.

- Basic probability theory.

- Discrete random variables and their probability distributions.

- Continuous random variables and their probability distributions.

- Multivariate probability distributions.

- Functions of random variables.

- Sampling distributions, the Central Limit Theorem and convergence of random variables (if time permits).

Calculator

For the exams and the quizzes, you may need to use a regular calculator. Even though, we mostly use **R** for computational purposes.

Statistical Software

In this course, we will be using the statistical software **R**. It is freely available at the following website: `https://www.r-project.org`. Some of the exams, projects, and HW assignments may involve the statistical package **R**. The exams may involve also the interpretation of output from the statistical package **R**.

   RStudio is a fancy interface for **R**. You can download it for free at `https://www.rstudio.com/products/rstudio/download/`. To use Rstudio you must download and install both **R** and Rstudio.

Webpage

Course-related materials (notes, HW, handouts, etc.) will be posted on the MyLeo Online (powered by D2L Brightspace). It is your responsibility to read the files and your email regularly for any important announcements.

   You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

   If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: `https://community.brightspace.com/support/s/contactsupport`

Grading criteria

The following grading weights (percentage) show how your total score is going to be calculated at the end of the semester:

Grade distribution		Tentative Schedule
Midterm I	25%	2nd week of June
Midterm II	25%	3rd week of June
Homework	20%	4–5 HW
Final	30%	July 2 or 3, upon discussion

All exams including the final will be proctored on zoom. There will be no exception on this. Make sure you have zoom and camera available during the exams.

Midterms: There will be two midterms that weigh 50% of the overall grades. Midterms will be heavily based on the HW and problems solved on the notes and handouts. You **must** study notes/handouts for proofs and derivations.

Homework: There will be around **4–5** HW. **No** late submission will be allowed. Performance on your HW will directly or indirectly impact on your overall grade. If you use ChatGPT or any other online resources to solve your HW, be careful. Most of the times they are wrong!

Final: The final will be a comprehensive exam. But it will be heavily weighted on the recent topics. Only the topics from Midterms that are the most relevant will be covered in the final. The final will be held on July 2 or 3.

Here is how grades will be awarded based on your weighted numerical score (out of 100):

A : $\geq$ 90,   B: 80 – 89.9,   C: 70 –79.9,   D : 60 –69.9,   F: $<$ 60,

Make-ups

No makeup midterms/exams will be given due to time restriction in summer session. If you miss an exam for a medical reason, you are supposed to provide a medical excuse from a doctor or the TAMU–Commerce Student Heath Service.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

- **Syllabus Change Policy:** The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance

  Any modifications will be announced in class. Thus, it is the student's responsibility to always come to class. (Most important announcements may also be put online or send via email; however, it is your responsibility to come to class to hear any important announcements such as corrections to homework and other stuff.)

University Specific Procedures/Policies

Following are some important links for University policies. You must follow these rules strictly.

- **TAMUC Attendence:** For more information about the attendance policy please visit the Attendance webpage and `http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx`

- **Student Conduct**: All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook. `http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx`.

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: `https://www.britannica.com/topic/netiquette`.

- **Academic Integrity:** Students at Texas A&M University–Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

  Undergraduate Academic Dishonesty 13.99.99.R0.03

  `http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf`

  Graduate Student Academic Dishonesty 13.99.99.R0.10

  `https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10.pdf`

- **Student Disability Resources and Services:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

  Office of Student Disability Resources and Services
  Texas A&M University–Commerce
  Gee Library- Room 162
  Phone (903) 886-5150 or (903) 886-5835
  Fax (903) 468-8148
  Email: `studentdisabilityservices@tamuc.edu`
  Website: Office of Student Disability Resources and Services
  `https://www.tamuc.edu/student-disability-services/`.

- **Nondiscrimination Notice:** Texas A&M University–Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

- **Tutoring**: The Math Lab is designed to supply free tutoring to students and is aimed at helping students at the remedial, Freshman, and Sophomore levels. Tutoring for higher-level courses is available, dependent on each tutor's ability. The Math Lab is located in Binnion Hall 328. Please remember to sign-in when you use the math lab. For more details: `https://rb.gy/seiea`.

  Additional turing help available at: `https://rb.gy/pd5lt`.

- **Writing Center:** Students are encouraged to visit the A&M–Commerce Writing Center for writing assistance. Visit the website at: `https://www.tamuc.edu/writing-center/`

- **Campus Concealed Carry Statement:** Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University–Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M–Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer. Web url: `http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf`

  Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M–Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

- **A&M-Commerce Supports Students' Mental Health:** The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit `www.tamuc.edu/counsel`.

- **AI Use in Courses (Draft):**

  Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

  Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

  Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

  In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

  13.99.99.R0.03 Undergraduate Academic Dishonesty

  13.99.99.R0.10 Graduate Student Academic Dishonesty

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