

TEXAS A&M UNIVERSITY COMMERCE
COLLEGE OF SCIENCE, AGRICULTURE AND ENGINEERING
DEPARTMENT OF MATHEMATICS

CLASS SYLLABUS

Instructor:	Dr. Joshua Patterson	Semester:	Spring, 2020
Office Phone:	903-886-5972	Office Hours:	MTWRF 12pm-1pm or by appointment
Office:	Henderson 301		
Website:	http://faculty.tamuc.edu/jpatterson/	Email:	Joshua.Patterson@tamuc.edu

I. Course: MATH 403.003, Introduction to Mathematical Statistics, 3 credit hours

II. Course Description: A calculus-based course in classical statistical inference. Topics covered include: estimation, hypothesis testing, linear regression and ANOVA, nonparametric methods and other topics as time allows. Prerequisites: MATH 2414, or Math 192 Calculus II, with grade of "C" or better.

III. Text: An Introduction to Mathematical Statistics and its Applications, 5th Edition, by Richard J. Larson and Morris L. Marx. Tentatively, parts of chapters 3, 5, 6, 7, 11, 12 and 14 of the text will be covered.

IV. Technology: TI-83/84 is highly recommended. Access to a computer algebra system is required, such as Mathematica, Matlab, or R.

V. Student Learning Outcomes:

- Use basic probability theory to solve problems and model data-generating processes.
- Demonstrate understanding of the ideas behind random sampling, statistical inference, and estimation.
- Choose the statistical techniques appropriate for a data set.
- Use a computer algebra system to perform basic data munging, summary, and analysis

VI. Methods of Evaluation:

Evaluation methods can include grading homework, chapter or major exams, quizzes, and computer assignments.

Attendance: Attendance is essential to student success. You are responsible for all announcements and materials presented in the class. Attendance will be recorded for intervention and financial aid purposes only. It will not be graded. That said, attendance is highly correlated to student success, so missing class or arriving perpetually late will likely impact your grade directly or indirectly.

Homework: Homework assignments are listed at the end of this syllabus. They will be collected weekly on each Tuesday. Selected questions will be graded. Homework of each week is worth 5 points. Late work will be subject to reduction of 3 points. Homework will not only affect your course grade, but also your exams. Without sufficient practice, you cannot perform well on exams. To be eligible for taking an exam, one must complete at least half of the homework for that exam. If one takes an exam without completing at least half of the homework, the exam will not be graded and its score will be zero. In this case, there will be no makeup for the exam. **At least half of all homework assignments need to be completed or the course grade will be an automatic F.**

Project: Random variables are all around us, from the time we require to commute to school, to the percentage of lecture material we remember for the exam, we can describe much of the world around us using probability.

Project Statement:

Find a random variable in your day-to-day life, call it $X(\omega)$, and do the following:

- Describe X as either quantitative, qualitative, discrete, continuous, etc.
- Give the support of X (i.e. its possible range of values)
- Speculate on its distribution. Is it normal, geometric, exponential, etc. Give specific reasons and justification for this speculation!
- Sample this random variable **at least 5 times.**
- Use this sample to estimate its parameters.
- Give the newly parameterized distribution explicitly.

Exams: There will be 2 exams. Each exam is worth 100 points. A make-up exam (with exception of the final exam) will be given only under very special circumstances and I am notified before the exam. Make-up exams may be more difficult than the classroom exam and must be made up within one week. To be eligible for taking an exam, one must complete at least half of the homework for the exam.

Final Exam: The Final Exam will be comprehensive and is worth of 150 points. It will be given **Tuesday 5/5/2020 from 8-10am.**

Extra Credit: On occasion, we may have an extra credit opportunity extended to the class. These opportunities may appear on exams as bonus questions, or may be take-home assignments. In either case, they will be limited to a maximum of 3 points per opportunity at most once per exam.

Grades: If one does not complete at least half of all homework assignments, the course grade will be an F. The maximum possible points available in this course are:

Homework	60 points
Project	20 points
2 Exams	200 points
<u>Final Exam</u>	<u>150 points</u>
Total	430 points

Your course grade will be based on the percentage of the points you make to the total points available in the course:

$$A \geq 90\%, \quad B \geq 80\%, \quad C \geq 70\%, \quad D \geq 60\%, \quad F < 60\%$$

VII. Other Information:

- Early Intervention for First Year Students: Early intervention for freshmen is designed to communicate the University's interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be emailed by the end of the sixth week of the semester.

- The information for students with disability: 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
- Basic Tenets of Common Decency: "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.) This means that rude and/or disruptive behavior will not be tolerated.
- Free tutoring service is provided by the Math Skill Center (Binnion Hall Room 328) with the following hours: M and W, 8am–8pm; T and R, 8am–6pm; and F 8am–12pm

CLASS SCHEDULE, Spring 2020
MATH 403.003
TR: 8:00 AM–9:15 AM, BA 244

Week of	Monday	Tuesday	Wednesday	Thursday	Friday
1/13		Syllabus 3.1 & 3.2		3.3	
1/20	MLK Day	3.4		3.5	
1/27		3.6	Census	3.12	
2/3		4.1-4.4		4.5 & 4.6	
2/10		Review		Exam 1	
2/17		5.1 & 5.2		5.3	
2/24		6.1 & 6.2		6.3	
3/2		6.4		7.1 & 7.2	
3/9	Spring Break				
3/16		7.3		7.4	
3/23		Review		Exam 2	
3/30		11.1 & 11.2		11.3	
4/6		11.4		12.1	
4/13		12.2		14.1	
4/20		14.2		14.3	
4/27		Review		Review	
5/4	FINAL EXAM: 5/5 8-10am				

*This schedule is for reference. The actual coverage of each day may be different. Please attend each class to learn what is taught. If you miss a class, you need to catch up by yourself.

WELCOME TO THIS CLASS
HAVE A SUCCESSFUL SEMESTER

MATH 403 Homework

Exam #1

Section 3.2, Page 108-109:	1, 3, 4, 5, 8
Section 3.3, Page 128:	1, 3 (HINT: See Example 3.3.10, pg. 128), 4, 5, 6
Section 3.4, Page 138:	1, 3, 4, 6, 13, 15
Section 3.5, Page 148:	1, 4, 5, 6
Section 3.6, Page 159:	2, 4, 5, 6, 13
Section 3.12, Page 210:	1, 2, 4, 5, 7
Section 4.2, Page 226:	3
Section 4.3, Page 245:	2, 3
Section 4.4, Page 262:	1, 2
Section 4.5, Page 269:	1
Section 4.6, Page 274:	1

Exam #2

Section 5.2, Page 291-292:	2, 3, 4, 5
Section 5.3, Page 309:	1, 4, 5, 7
Section 6.2, Page 360:	1(a,b,c), 2, 3(a,b), 4
Section 6.3, Page 265-366:	1(a,b), 2, 3
Section 6.4, Page 377-378:	4, 5, 6(a,b,c)
Section 7.2, Page 386:	None
Section 7.3, Page 394:	1, 2, 3, 4, 8
Section 7.4, Page 399:	1(a,b,c,d), 2(a,b,c,d), 4, 5

Final Exam

NOTE: the final exam is cumulative, so it will cover all prior material and homework in addition to the following:

Section 11.2, Page 540-541:	1, 2, 3, 4, 5
Section 11.3, Page 568:	1, 3, 5, 6
Section 11.4, Page 577:	1, 3, 4, 5 & 11 on pg. 581
Section 12.2, Page 605-606:	1, 3, 4, 7
Section 14.2–14.3:	TBA