

Syllabus

Title	Probability
Number	MATH 5375-162
Time	TR 5:30–6:45
Place	BH 225
Instructor	David Milovich
Email	david.milovich@tamiu.edu
Phone	(956) 326-2570
Office	BVC 321
Hours	MTR 3:00-5:00
Department	Engineering, Mathematics, and Physics
College	Arts and Sciences
Institution	Texas A&M International University
Term	Fall 2012

Course description. Topics include: distribution functions, random variables, expectation, independence, convergence concepts, law of large numbers, characteristic functions, the central limit theorem, conditional expectation, martingales and Brownian motion. Prerequisites: MATH 5305.

Student learning outcomes. Upon successful completion of this course, the student will be able to:

- interpret the main concepts and results in measure theory, define sample spaces, probability measure, and events, and compute probabilities of events;
- distinguish various modes of convergence;
- explain concept of conditional probability and independent events, determine whether events are independent or not, and compute probabilities (joint and conditional) of two or more random variables;
- interpret and simulate law of large numbers, and apply central limit theorem to compute normal approximations to random variables;
- solve simple problems on martingales, stopping time, and Brownian motion.

Textbook. Required: *Radically Elementary Probability Theory* (1987). Edward Nelson. Princeton University Press. ISBN: 978-0691084749. See also the free electronic version:

<https://web.math.princeton.edu/~nelson/books.html>

Optional: *A Course in Probability Theory*, Third Edition (2000). Kai Lai Chung. Academic Press. ISBN: 0121741516.

The first book takes a non-traditional approach that I think you will find easier to learn. In class I will supplement this material by translating the important theorems into the traditional context found in the second book. I will also supplement with instruction on creating simple computer simulations of random stochastic processes.

Classroom expectations. Class participation is 10% of your grade. Class days will alternate between a lecture day and a day for problem-solving and discussion. Before each discussion day, you will be assigned textbook sections to read and exercises to be attempted. You are expected to seriously engage with the assigned readings and exercises and be prepared to discuss them with your classmates.

Presentation. 15% of your grade is based on a 20-minute classroom presentation, either on content from the book, or on another topic of your choice.

- All presentations must be scheduled at least two weeks in advance. See the schedule below for suggested dates.
- Presentations given later in the semester are expected to be more advanced and will be graded accordingly.
- All presentation topics must be approved by me.
- All presentations must be rehearsed with me in my office.

Project. 15% of your grade is based on a simulation project in which you will prepare a computer simulation to illustrate concepts from the book. Projects may be done individually or jointly by a pair. (No groups of 3 or more.) The computer labs BVC 202 and BVC 205 have the needed programming tools; you may also install them (at no cost) on your own computer.

Tests. The two take-home tests (see the schedule below) are each worth 20% of your grade; the take-home final exam is worth 25% of your grade. Tests are open-book and open-note, but must be your own work. That is, you may consult written, printed, and electronic resources, but you may not ask another person, either directly or indirectly (such as through an internet forum) questions for your test.

Grading.

letter	score of $x\%$
A	$90 \leq x$
B	$80 \leq x < 90$
C	$70 \leq x < 80$
D	$60 \leq x < 70$
F	$0 \leq x < 60$

Make-ups. There are no make-ups for missed work, except by situations covered by university rules.

Approximate Schedule of Topics

Date	Chapter	Notes
23-Aug	1	
28-Aug	2	
30-Aug	3	
4-Sep	4	
6-Sep	5	
11-Sep	5	
13-Sep	6	
18-Sep	6	
20-Sep		presentations
25-Sep	7	
27-Sep	7	Test I assigned
2-Oct	8	Test I due
4-Oct	9	
9-Oct	10	
11-Oct	11	
16-Oct	11	
23-Oct	12	
25-Oct		presentations
30-Oct	12	
1-Nov	13	Test II assigned
6-Nov	14	Test II due
8-Nov	15	
13-Nov	16	
15-Nov	16	
20-Nov	17	
27-Nov		presentations
29-Nov	18	simulations due
4-Dec		simulations discussed

The above schedule may be slightly adjusted to accomodate additional student presentations.

Policies of the College of Arts and Sciences

(Required on all COAS Syllabi)

Classroom Behavior

The College of Arts and Sciences encourages classroom discussion and academic debate as an essential intellectual activity. It is essential that students learn to express and defend their beliefs, but it is also essential that they learn to listen and respond respectfully to others whose beliefs they may not share. The College will always tolerate diverse, unorthodox, and unpopular points of view, but it will not tolerate condescending or insulting remarks. When students verbally abuse or ridicule and intimidate others whose views they do not agree with, they subvert the free exchange of ideas that should characterize a university classroom. If their actions are deemed by the professor to be disruptive, they will be subject to appropriate disciplinary action, which may include being involuntarily withdrawn from the class.

Plagiarism and Cheating

Plagiarism is the presentation of someone else's work as your own. **1)** When you borrow someone else's facts, ideas, or opinions and put them entirely in your own words, you must acknowledge that these thoughts are not your own by immediately citing the source in your paper. Failure to do this is plagiarism. **2)** When you also borrow someone else's words (short phrases, clauses, or sentences), you must enclose the copied words in quotation marks as well as citing the source. Failure to do this is plagiarism. **3)** When you present someone else's paper or exam (stolen, borrowed, or bought) as your own, you have committed a clearly intentional form of intellectual theft and have put your academic future in jeopardy. This is the worst form of plagiarism.

Here is another explanation from the 2010, sixth edition of the *Manual of The American Psychological Association* (APA):

Plagiarism: Researchers do not claim the words and ideas of another as their own; they give credit where credit is due. Quotations marks should be used to indicate the exact words of another. *Each* time you paraphrase another author (i.e., summarize a passage or rearrange the order of a sentence and change some of the words), you need to credit the source in the text.

The key element of this principle is that authors do not present the work of another as if it were their own words. This can extend to ideas as well as written words. If authors model a study after one done by someone else, the originating author should be given credit. If the rationale for a study was suggested in the Discussion section of someone else's article, the person should be given credit. Given the free exchange of ideas, which is very important for the health of intellectual discourse, authors may not know where an idea for a study originated. If authors do know, however, they should acknowledge the source; this includes personal communications. (pp. 15-16)

Consult the Writing Center or a recommended guide to documentation and research such as the *Manual of the APA* or the *MLA Handbook for Writers of Research Papers* for guidance on proper documentation. If you still have doubts concerning proper documentation, seek advice from your instructor prior to submitting a final draft.

Use of Work in Two or More Courses: You may not submit work completed in one course for a grade in a second course unless you receive explicit permission to do so by the instructor of the second course.

Penalties for Plagiarism: Should a faculty member discover that a student has committed plagiarism, the student should receive a grade of 'F' in that course and the matter will be referred to the Honor Council for possible disciplinary action. The faculty member, however, may elect to give freshmen and sophomore students a "zero" for the assignment and to allow them to revise the assignment up to a grade of "F" (50%) if they believe that the student plagiarized out of ignorance or carelessness and not out of an attempt to deceive in order to earn an unmerited grade. This option should not be available to juniors, seniors, or graduate students, who cannot reasonably claim ignorance of documentation rules as an excuse.

Caution: Be very careful what you upload to Turnitin or send to your professor for evaluation. Whatever you upload for evaluation will be considered your final, approved draft. If it is plagiarized, you will be held responsible. The excuse that "it was only a draft" will not be accepted.

Caution: Also, do not share your electronic files with others. If you do, you are responsible for the possible consequences. If another student takes your file of a paper and changes the name to his or her name and submits it and you also submit the paper, we will hold both of you responsible for plagiarism. It is impossible for us to know with certainty who wrote the paper and who stole it. And, of course, we cannot know if there was collusion between you and the other student in the matter.

Penalties for Cheating: Should a faculty member discover a student cheating on an exam or quiz or other class project, the student should receive a "zero" for the assignment and not be allowed to make the assignment up. The incident should be reported to the chair of the department and to the Honor Council. If the cheating is extensive, however, or if the assignment constitutes a major grade for the course (e.g., a final exam), or if the student has cheated in the past, the student should receive an "F" in the course, and the matter should be referred to the Honor Council. Under no circumstances should a student who deserves an "F" in the course be allowed to withdraw from the course with a "W."

Student Right of Appeal: Faculty will notify students immediately via the student's TAMIU e-mail account that they have submitted plagiarized work. Students have the right to appeal a faculty member's charge of academic

dishonesty by notifying the TAMIU Honor Council of their intent to appeal as long as the notification of appeal comes within 5 business days of the faculty member's e-mail message to the student. The *Student Handbook* provides details

UConnect, TAMIU E-Mail, and Dusty Alert

Personal Announcements sent to students through TAMIU's UConnect Portal and TAMIU E-mail are the official means of communicating course and university business with students and faculty – not the U.S. Mail and not other e-mail addresses. Students and faculty must check UConnect and their TAMIU e-mail accounts regularly, if not daily. Not having seen an important TAMIU e-mail or UConnect message from a faculty member, chair, or dean is not accepted as an excuse for failure to take important action. Students, faculty, and staff are encouraged to sign-up for *Dusty Alert* (see www.tamtu.edu). *Dusty Alert* is an instant cell phone text-messaging system allowing the university to communicate immediately with you if there is an on-campus emergency, something of immediate danger to you, or a campus closing.

Copyright Restrictions

The Copyright Act of 1976 grants to copyright owners the exclusive right to reproduce their works and distribute copies of their work. Works that receive copyright protection include published works such as a textbook. Copying a textbook without permission from the owner of the copyright may constitute copyright infringement. Civil and criminal penalties may be assessed for copyright infringement. Civil penalties include damages up to \$100,000; criminal penalties include a fine up to \$250,000 and imprisonment.

Students with Disabilities

Texas A&M International University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal education opportunity. It is the student's responsibility to register with the Director of Student Counseling and to contact the faculty member in a timely fashion to arrange for suitable accommodations.

Incompletes

Students who are unable to complete a course should withdraw from the course before the final date for withdrawal and receive a "W." To qualify for an "incomplete" and thus have the opportunity to complete the course at a later date, a student must meet the following criteria:

1. The student must have completed 90% of the course work assigned before the final date for withdrawing from a course with a "W", and the student must be passing the course;
2. The student cannot complete the course because an accident, an illness, or a traumatic personal or family event occurred after the final date for withdrawal from a course;
3. The student must sign an "Incomplete Grade Contract" and secure signatures of approval from the professor and the college dean.
4. The student must agree to complete the missing course work before the end of the next long semester; failure to meet this deadline will cause the "I" to automatically be converted to a "F"; extensions to this deadline may be granted by the dean of the college.

This is the general policy regarding the circumstances under which an "incomplete" may be granted, but under exceptional circumstances, a student may receive an incomplete who does not meet all of the criteria above if the faculty member, department chair, and dean recommend it.

Student Responsibility for Dropping a Course

It is the responsibility of the STUDENT to drop the course before the final date for withdrawal from a course. Faculty members, in fact, may not drop a student from a course without getting the approval of their department chair and dean.

Independent Study Course

Independent Study (IS) courses are offered only under exceptional circumstances. Required courses intended to build academic skills may not be taken as IS (e.g., clinical supervision and internships). No student will take more than one IS course per semester. Moreover, IS courses are limited to seniors and graduate students. Summer IS course must continue through both summer sessions.

Grade Changes & Appeals

Faculty are authorized to change final grades only when they have committed a computational error or an error in recording a grade, and they must receive the approval of their department chairs and the dean to change the grade. As part of that approval, they must attach a detailed explanation of the reason for the mistake. Only in rare cases would another reason be entertained as legitimate for a grade change. A student who is unhappy with his or her grade on an assignment must discuss the situation with the faculty member teaching the course. If students believe that they have been graded unfairly, they have the right to appeal the grade using a grade appeal process in the *Student Handbook* and the *Faculty Handbook*.

Final Examination

Final Examination must be comprehensive and must contain a written component. The written component should comprise at least 20% of the final exam grade. Exceptions to this policy must receive the approval of the department chair and the dean at the beginning of the semester.